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Introduction

The **7th Asia-Pacific Glaucoma Congress** in conjunction with the **Philippine Academy of Ophthalmology** and the **Philippine Glaucoma Society** will be held in **Manila, Philippines**, from **May 24 to 26, 2024**.

The Asia-Pacific Glaucoma Congress brings together clinicians, scientists, students, and other health practitioners from the field of ophthalmology with a focus on glaucoma. The program provides a platform for delegates to collaborate and share experiences, knowledge, and research results whilst also learning about the world's best practice and recent innovations, helping us overcome challenges in clinical medicine and surgery.

Dr Seng Kheong Fang
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Dr Norman M. Aquino
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A/Prof Joseph Anthony Tumbocon
APGC 2024 Scientific Program Committee Co-Chair

Program overview

The Asia-Pacific Glaucoma Congress invited submissions for the official program over a broad range of themes, including but not limited to basic and laboratory sciences, epidemiology, quality of life and health economics, glaucoma imaging and investigation, glaucoma surgery, laser and other non-incisional therapies.

All submissions were peer reviewed to ensure a fair and equitable process. Ultimately, 40 oral presentations, 34 film festival presentations, and 147 poster presentations were accepted in the official program.

We hope that you find value and ongoing education benefit from this publication of accepted oral, film festival, and poster presentation submissions.

Film Festival Presentations

ISTENTS: LOST AND FOUND

Acosta P[1], Sng J[1], Yong V[1]

[1]National Healthcare Group Eye Institute, Tan Tock Seng Hospital

This video illustrates 2 cases of missing iStents following re-threading in the anterior chamber, along with strategies to avert such occurrences. In the initial case, the second stent was under-implanted. Viscoelastic was introduced to eliminate blood and optimize stent positioning for re-threading, which was successful with the sleeve retracted for stent protection upon exiting the anterior chamber. Post-implantation, however, the stent was nowhere to be seen in the angle. Fortunately, it was eventually found on the lateral canthus after searching the field and the trocar. The second case involved the initial stent being implanted too low. The iStent was dislodged from the angle and was rethreaded in the anterior chamber. Shortly after coming out, the stent was unnoticeably found right outside the main incision. After thorough searching, the stent was identified fortunately on the same location. Both cases were able to reimplant the stent successfully. We applied our learnings to the next case where we encountered under-implantation of iStent. After rethreading in the anterior chamber, precautions included fully retracting the sleeve and exiting more slowly to prevent stent dislodgment upon exiting the main wound. After facing another unsuccessful implantation, an external rethreading approach was adopted. A sterile paper with a blob of viscoelastic served as a secure base for rethreading, ensuring stent stability and preventing misplacement. This alternative method offers a safer means of re-threading, mitigating the risk of future losses.

PHACO-ELIOS: SURGICAL TECHNIQUE AND RESULTS

Chaves-Samaniego M[1]

[1]Mediclinic Parkview Hospital

Introduction

Over the years, glaucoma surgery and MIGS have evolved toward techniques that are less traumatic to the anatomy of the iridocorneal angle. Excimer laser trabeculostomy (ELT-Elios) is a laser-based MIGS technique commonly associated with cataract surgery for ocular hypertension or mild glaucoma.

Methods

Excimer laser trabeculostomy (ELT–Elios) is an implant-free MIGS that creates 10 microchannels in the trabecular meshwork to improve the aqueous outflow into the Schlemm's canal. This video shows the standard surgical technique and the results obtained from 20 patients over a 6-month follow-up.

Results

At 6 months after phacoemulsification and Elios, the mean number of hypotensive medications was reduced significantly from 1.47 before surgery to 0.36. There were no complications related to the treatment, except for 1 case of mild hyphaema in the first postoperative week related to oral antiplatelet medication.

Conclusion

Several studies have shown that Elios is a safe and easy procedure, which allows the reduction of intraocular pressure in patients with early glaucoma, with a low rate of complications. In addition, this technique produces a minimal anatomical variation that does not interfere with future filtering surgeries or drainage device implantation.

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PRIMING THE AGV TUBE: TWO SIDES OF A COIN-FUNCTIONING AND MALFUNCTIONING

Dangeti D[1], Senthil S[1]

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The Ahmed Glaucoma Valve (AGV) implant plays a significant role in the management of refractory glaucoma both in children and adults. There was only a single case report mentioned about malfunction of the implant post implantation, but we are first to report and describe the dysfunction prior to implantation and show it on a video demonstration. Implantation of such malfunctioned implants lead to failure and require replacement.

This video highlights the importance of a simple priming procedure done under surgical microscope with cautious observation in early identification of any dysfunction in the AGV device to prevent from serious postoperative complications, that plays role in successful management of complex glaucoma cases.

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PAUL GLAUCOMA IMPLANT WITH STENT LOOPED IN THE CORNEA

Figueras M[1], Okada N[1], Aquino M[1], Koh V[1,2], Chew P[1,2]

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This surgical video shows the steps of implanting Paul Glaucoma Implant (PGI) with stent looped in the cornea. The PGI is a valveless type of glaucoma drainage device developed by Professor Paul Chew to efficiently control intraocular pressure. During surgery, a 6-0 polypropylene monofilament can be used as a stent to further decrease the risk of hypotony. A/P Victor Koh developed a technique involving the cornea to increase the visibility of the stent when it is to be removed postoperatively.

The essential steps go as follows:

1. Corneal traction suture
2. Subconjunctival anaesthetic
3. Conjunctival peritomy supero-nasally
4. Isolate rectus muscles
5. Check patency of PGI
6. Stent with 6-0 prolene monofilament
7. Insert other end of prolene with needle through the hole positioned nasally
8. Plate tucked under rectus muscles
9. 9mm from limbus to the plate
10. Suture with 8-0 nylon
11. Create scleral trench
12. Cut tube to desired length
13. Create scleral track with gauge 25 needle
14. Corneal paracentesis
15. Insert tube to the anterior chamber

16. Fill anterior chamber with BSS
17. Suture tube onto scleral trench
18. 2 mm stent from edge of the plate
19. Check flow
20. Tutopatch over PGI
21. Partial thickness cornea incision
22. Scleral cornea pass out to that incision
23. Create loop by entering initial incision and out through the sclera
    a. (Loop buried underneath corneal epithelium)
24. Trim prolene
25. Close conjunctiva with glue and 10-0 nylon
26. Subconjunctival steroid and antibiotic

SURGICAL MANAGEMENT OF POST-TRAUMATIC CYCLODIALYSIS CLEFT AND HYPOTONOUS MACULOPATHY

Indu Pavani V[1], Senthil S[1]

[1]LV Prasad Eye Institute

Background/Purpose

A cyclodialysis cleft refers to the pathway that is formed following blunt trauma to the eye or during an intraoperative procedure, allowing aqueous humour to drain from the anterior chamber into the suprachoroidal space. When the cleft size is large or it is present along with poor aqueous humour production, such abnormal and excessive aqueous drainage may be significant enough to result in ocular hypotony and result in substantial vision loss.

Materials and Methods

Management is based on the size of the cyclodialysis cleft, and response to medical, non-surgical, or surgical treatment, prescribed in that order, to close the opening. This stepwise approach is elucidated here, and further illustrated by an exemplar surgery in a case of post-traumatic cyclodialysis cleft with related hypotony maculopathy. Practical tips are provided to correctly follow the technique to promote adherence and prevent cleavage recurrence.

Conclusion

Early diagnosis and appropriate intervention go a long way in successful management of hypotony resulting from cyclodialysis cleft.

SCHLEMM'S CANALOPLASTY WITH TRABECULOTOMY WITH THE OMNI SURGICAL SYSTEM FOR LOWERING IOP IN OPEN-ANGLE GLAUCOMA

Jadhav V, Mathews D

This video demonstrates the technique of OMNI MIGS procedure with some tips for its successful performance. It also described our experience with this procedure. We have 12-month results for 20 eyes who underwent combined cataract surgery and OMNI procedure.

The OMNI glaucoma treatment is a safe and minimally invasive surgery that helps reduce the intraocular pressure by opening up and restoring the flow through the eye's natural draining pathway. This can be done as a standalone procedure or can be combined with cataract surgery. It involves a specially designed micro-catheter, inserted into the Schlemm's canal, through a single clear corneal incision This allows injection of viscoelastic to dilate it and the distal collector channels. Once that is done, the microcatheter can be used to perform trabeculotomy to address the trabecular meshwork as a point of resistance within the conventional outflow pathway. This procedure does not leave any implant behind. This procedure is offered in mild to moderate glaucoma with or without cataract surgery. Intraoperative gonioscopy shows en face view of the angle structures and does have a learning curve. Intraoperative bleeding during the procedure can be tackled by using the cohesive viscoelastic to displace the blood. Alternatively, the IA probe can be used to clear the anterior chamber of blood. This procedure can be offered even in patients who have had prior filtering surgery or another MIGS device implantation.

AB INTERNO SUPRAMID SUTURE STENTING FOR LATE POSTOPERATIVE HYPOTONY FOLLOWING AUROLAB AQUEOUS DRAINAGE IMPLANT

K Y[1], Manapakkam M[1]

[1]Aravind Eye Hospital

The Aurolab Aqueous Drainage Implant (AADI) is regularly used non-valved drainage device. Hypotony is sight threatening complication following implantation of AADI. A 72-year-old female, a known case of primary angle closure glaucoma in both eyes (BE) with history of central retinal vein occlusion in right eye (RE) and branch retinal vein occlusion in left eye (LE), underwent trabeculectomy with phacoemulsification and intraocular lens implantation in BE. Post-surgery, despite maximum medical therapy the intraocular pressure (IOP) remained high in LE. An AADI implantation was done in the LE for controlling the IOP. Post AADI implantation the IOP was within normal limits until 6 months. Later IOP gradually dropped to 5mmhg leading to hypotony. Hypotony was refractive to medical management. Patient developed choroidal detachment for which ab interno stenting of the AADI tube with a supramid suture was planned. Supramid suture (3-0 nylon multifilament) was used for stenting the AADI tube by making 2 side ports and using micro forceps fed into the lumen of the tube. On postoperative day 1, best-corrected visual acuity was 6/9 with well-formed anterior chamber and IOP was 15 mmHg. There are case reports describing ab interno stenting of the tube with 4-0 polypropylene suture for hypotony after implantation of a glaucoma drainage device. Our video highlights the significance of ab interno stenting for late post-operative hypotony with Supramid nylon suture. It is a simple, minimally invasive, and modifiable procedure for treating both early and late postoperative hypotony following a non-valved drainage device.

PAUL GLAUCOMA IMPLANT–HOW AND WHY!

Konar I, Mathews D, Jadhav V

This video demonstrates a safe surgical technique for implantation of the Paul Glaucoma Implant (PGI). The PGI tube is a novel glaucoma drainage device designed to lower IOP. It is optimised with a large plate surface area for aqueous filtration and small internal calibre of the micro-sized tube to create high flow resistance and prevent hypotony. This is a safe surgical technique, which significantly reduces IOP and number of medications with minimal complications. The video explains the outcomes of an early audit of PGI in our unit and why we prefer to use the PGI in refractory glaucoma.

TERROR OF THE POPPY EYE

Lee G[1]

[1]Mater Hospital, Brisbane

This is an unusual case of extreme globe subluxation during phacoemulsification in a 38-year-old female with congenital glaucoma. She previously had trabeculectomies that failed over time and required Baerveldt tube implants. The right eye was amblyopic. During the left eye surgery, when irrigation/aspiration of the cortex was performed, the anterior chamber shallowed and the intraocular pressure dramatically elevated. Intravenous mannitol and a pars plana vitrectomy were required to allow insertion of an intraocular lens and closure of the corneal incisions. Following speculum removal, the left globe was noted to be extremely subluxated, anterior to the eyelids. There was no obvious haemorrhage. It was decided that lateral canthotomy would not be recommended as it potentially would have caused further proptosis. The only option at the time was to manually decompress the orbital tissues to allow the return of the globe into the bony orbit. This process took a harrowing 40 minutes before partial eyelid closures became possible. The pathophysiology causing the intraoperative globe subluxation was the egress of fluid from the phacoemulsification, flowing up the Baerveldt tube and into the retro-orbital space. Direct mechanical pressure to the eyelids was required to progressively relocate the fluid back into the circulation. This complication was prevented in the second eye by pre-treatment with intravenous mannitol, regional and general anaesthesia, anterior suspension of the speculum to the drapes and reduction of irrigation fluids. The second surgery was less eventful and the patient ultimately gained the best possible visual acuity.

ACTSEB: A RETRO REWIND

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[1]St. Luke's Medical Center

Managing eyes with pre-existing encircling bands and medically uncontrolled IOP is difficult due to previous conjunctival surgery and presence of an impediment to conventional tube surgery. The technique described in this video is a modification of the Schocket procedure known as anterior chamber tube shunt to an encircling band (ACTSEB). This was performed in an eye with a pre-operative IOP of 30 mmHg on maximum topical and systemic glaucoma medications.

Superotemporal conjunctival and sub-Tenon's dissection up to the capsule of the encircling band. Incisions were made through the capsule of the encircling band and a Crawford lacrimal tube (external diameter 0.64 mm/internal diameter 0.3 mm) was inserted into the space between the band and capsule for approximately 90 degrees. Multiple tube side ports are placed prior to inserting the tube into the capsule to prevent tube obstruction. A 5-0 prolene intraluminal stent/rip-cord suture and 6-0 vicryl external ligating suture were placed to prevent hypotony. The tube was then fixated to the encircling band and sclera with multiple 10-0 nylon simple interrupted sutures. A tube track into the anterior chamber was created using a gauge 23 needle, venting slits created, and a scleral patch was used to cover the anterior subconjunctival portion of the tube. Conjunctival closure was done with a combination of 10-0 nylon and 8-0 vicryl sutures. Postoperatively, there was absence of hypotony or any complications. At 9 weeks postoperative, the best spectacle corrected visual acuity was similar to preoperative at 20/40 and IOP ranged from 15 to 16 mmHg on 1 glaucoma medication up to the last follow-up.

In conclusion, the ACTSEB is a useful procedure to manage eyes with encircling band and medically uncontrolled IOP. This video describes techniques and pearls to optimize outcomes.

AUGMENTED TRABECULECTOMY WITH RELEASABLE SUTURES UNDER SUB-TENON ANAESTHESIA

Mohamed M

REVISION OF A FAILED TRABECULECTOMY USING A MAKESHIFT SCLERAL PATCH WITH PHACOEMULSIFICATION AND IOL INSERTION

Buan A[1], Coronel-Nasol M[1]

[1]Cardinal Santos Medical Center, Philippines

Late-onset bleb leakage is a vision threatening complication of glaucoma filtering procedures that usually requires surgical repair. In this video, we present a revision of a leaking trabeculectomy followed by phacoemulsification with IOL insertion. The patient is a middle-aged hyperopic female who underwent emergency trabeculectomy after failed laser iridectomy 3 years prior. She was not maintained on any glaucoma medication but had progressive blurring of vision. Upon consultation, patient had a best-corrected visual acuity of 20/400 in the left eye. Slit lamp examination revealed a slightly shallow, non-dilating pupil with 360-degree synechiae adhered to a matured cataract. Supero-nasal to the limbus, there was a high, avascular, cystic bleb of 1 and half clock hours with a positive Seidel's test. The surgery showcases revision of a failed trabeculectomy followed by phacoemulsification with IOL insertion. In the area of the previous failed bleb, the ring of steel was dissected and removed when egress of aqueous humour was noted. Intraoperatively, a small, severely thinned out triangular flap was found covering the sclerostomy permitting a fast egress of aqueous. To control the flow, a makeshift scleral patch was sutured on top of the melted triangular flap. Conjunctival closure was ensured using nylon 10-0. This was followed by synechiolysis and phacoemulsification. The bleb was intact and working well as evidenced by a 360-degree ballooning of the surrounding conjunctiva during phacoemulsification. Patient was closely followed-up, with a postoperative visual acuity of 20/20 on a +31.0 IOL, and an IOP of 10 mmHg.

UNMASKING SILICONE OIL-FILLED ANTERIOR CHAMBER

Puttagunta S[1], Kolipaka G[1], Narayanan R[1], Senthil S[1]

[1]LV Prasad Eye Institute

Silicone oil, commonly used as an endotamponade in vitreoretinal surgeries, can lead to secondary glaucoma, often due to emulsified silicone oil obstructing the drainage of aqueous humour. Elevated intraocular pressure can also manifest in the early postoperative period, particularly in individuals who have undergone natural lens removal (aphakes) or in pseudophakes with a compromised posterior capsule. Nevertheless, in cases where silicone oil triggers acute pupillary block, it hinders the normal flow of aqueous humour into the anterior chamber, ultimately displacing it and completely filling the chamber. Patients experiencing this phenomenon typically present with sudden ocular pain and increased intraocular pressure. Yet its diagnosis can be challenging due to the absence of classic pupillary block indicators like a shallow anterior chamber or iris bombe. In this video, we elucidate this infrequent and elusive clinical scenario through a case study, offering diagnostic clues. Relief from pupillary blockage can be achieved by either creating a new iridotomy or reopening an existing obstructed one, as was performed in this patient, alleviating their pain and reducing intraocular pressure. Vigilance for these markers, indicative of silicone oil's presence in (filling) the anterior chamber, is imperative to pre-empt major complications such as secondary glaucoma and silicone oil-induced keratopathy.

AB-INTERNO GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY (GATT) AFTER FAILED AGV FOR REFRACTORY POST VITREORETINAL SURGERY GLAUCOMA

Puttagunta S[1], Kwarteng K[1], Senthil S[1]

[1]LV Prasad Eye Institute

Glaucoma management following vitreoretinal surgery is often intractable. Ahmed Glaucoma Valve (AGV) surgery is typically considered in such cases with scarred conjunctiva. Nevertheless, even AGV can fail, potentially necessitating cyclodestructive procedures, often with unpredictable outcomes. Recently, gonioscopy-assisted transluminal trabeculotomy (GATT) has emerged as a promising avenue for open-angle glaucoma management. This video features management of a 25-year-old myope who developed intractable glaucoma following vitreoretinal surgery (with encircling band), post silicone oil removal. Despite a primary AGV procedure, there was persistent high intraocular pressure (IOP) on maximal medical therapy, including high-dose oral acetazolamide. There were residual emulsified silicone oil bubbles as well. Faced with these challenges and reluctant to resort to cyclodestructive methods in this young patient with open angles and relatively healthy optic disc, we opted for minimally invasive glaucoma surgery and GATT was our choice. In a single session, we performed anterior chamber wash, phacoemulsification cataract surgery with toric intraocular lens placement, and a 360-degree GATT. The vision improved to 20/20 and the IOP was well controlled post GATT. This case underscores the complexities, insights, and management of eyes post vitreoretinal surgeries with refractory glaucoma by alternate options rather than a second tube or a cyclodestructive procedure.

SCLERAL "TURTLEPLAST" FOR TUBE EROSION AND REMOVAL

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[1]University Of Chicago, [2]Chicago Glaucoma Consultants

This is a case of a monocular 82-year-old pseudophakic Caucasian woman with uveitic glaucoma who had undergone insertion of an Ahmed FP7 in the anterior chamber 12 years ago. She had been on chronic steroids and NSAIDs and developed tube erosion from the tube entry site at the limbus all the way to the tube-plate junction. There was no infection. She was referred to us to address the tube erosion in her better-seeing eye. The plan was to do a goniotomy and remove the Ahmed. If IOP should rise in the future, she would undergo a staged inferonasal tube later.

The tube entry site into the anterior chamber was very anterior, right at the limbus, and very short. Behind this fistula, there was an area of scleral thinning. A dehydrated piece of scleral Tutoplast was shaped like a small rectangle with an attached larger rectangle so the smaller part could be used to plug the fistula and the attached larger part could be used to reinforce the adjacent area of scleral thinning. The patch graft was sutured to the sclera at the 4 corners and resembled a turtle with four sutures for legs with its head in the fistula; hence, we are calling this technique the “Turtle-Plast”. The capsule tissue from the former Ahmed was sutured on top of the tutoplast, and there was an extra mattress suture anchoring this capsule autograft in front of the former tube entry site, to prevent leakage from this site. The conjunctiva was closed.

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THREE TECHNIQUES FOR GUIDEWIRE-ASSISTED SULCUS TUBE ENTRY

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[1]University Of Chicago, [2]Baylor College of Medicine, [3]Cole Eye Institute

This video demonstrates 3 different techniques for using a prolene guidewire to help with sulcus tube entry.

Technique 1: The needle is inserted into the eye via a paracentesis 180 degrees across the planned tube entry site, advanced across the anterior chamber, into the sulcus, and exits the sclera at the planned tube entry site. A prolene guidewire is threaded into the needle, and pulled through as the needle is backed out. The tube is threaded onto the guidewire and pulled into the sulcus as the guidewire is removed.

Technique 2: A paracentesis can be made anywhere else on the eye, and a guidewire is placed in the eye through that paracentesis. The needle is inserted into the sulcus at the usual tube entry site. The needle is removed and micro-forceps are inserted into the sclerotomy site, the guide wire is grasped and externalized at the tube entry site. The tube is threaded onto the guidewire and pulled into the sulcus as the guidewire is removed.

Technique 3: A paracentesis is made 180 degrees across from the planned tube entry site. The needle is inserted into the sulcus at the usual tube entry site. The needle is kept in the eye, and the guidewire is grasped with tying forceps outside the eye and docked into the needle bevel, the needle is backed out which pulls the guidewire through. The tube is threaded onto the guidewire and pulled into the sulcus as the guidewire is removed.

THE ISTENT VIDEOCASSETTE PEDAGOGY: AN INNOVATIVE TEACHING GUIDE FOR MIGS PLATFORM (LIKE NEVER BEFORE...!)

Ramesh P[1]

[1]Medical Officer, Department of Glaucoma and Research, Mahathma Eye Hospital Private Limited

This video introduces an innovative videocassette pedagogy focused on iStent® procedures, providing a detailed resource for novices entering the realm of minimally invasive glaucoma surgery (MIGS). In this video, we have highlighted the various tips and tricks of iStent® and iStent inject® (Glaukos Corporation, CA, United States) implantation with many signs which have never been reported in the video literature before. It emphasizes the need for a comprehensive resource in the form of detailed scenarios and methodologies.

The various scenarios covered in the videocassette include:

1. The Gliding Technique
2. Cheese Wiring Trabecular Meshwork Management Technique
3. Combined MIGS
4. The Nudge Technique
5. Tackling Rebound Due to Cartridge Malfunction
6. Denting And Blanching Sign
7. Lost But Found
8. Practising In the MetaVerse (The 3D Novel Simulator)

The methods are explained with a focus on their application for neophyte surgeons. Compelling outcomes were achieved through the application of the diverse techniques featured in the videocassette, showcasing significant reductions in

intraocular pressure across various types of glaucoma. The video concludes by emphasizing the significance of the iStent videocassette pedagogy as an indispensable guide for novices, facilitating their transformative journey into the specialized field of MIGS. This structured format provides a clear delineation of the content, making it accessible and informative to those interested in the iStent videocassette pedagogy for MIGS.

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A COMPLEX CASE INVOLVING SECONDARY GLAUCOMA, SUSPECTED TRAUMATIC ENDOPHTHALMITIS, AND TRAUMATIC CATARACT IN A YOUNG MALE

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This case report addresses the intricate management of a 39-year-old male with secondary glaucoma, traumatic endophthalmitis, and concurrent cataract following a traumatic corneal laceration. Initial treatment with glaucoma medications, steroids, antibiotics, and laser peripheral iridotomy failed to alleviate persistently elevated intraocular pressure (IOP) and inflammation. Subsequently, a series of surgical interventions were performed.

The surgical procedures commenced with the creation of ports and the use of trypan blue for visualization. Intracameral injections of epinephrine and viscoelastic substances were administered, followed by synechiolysis using a Sinsky and Kuglen clockwise from 4 to 6 o'clock. Additional intracameral injections of viscoelastic material ensued. A second port was created at 3 o'clock, and synechiolysis was performed clockwise from 6 to 3 o'clock. Anterior capsulotomy using a can opener technique and lens aspiration with a Simcoe were conducted. The surgical steps also included irrigation, iridectomy at 1 o'clock, corneal hydration at the main port and side port, intracameral injection of cefuroxime, intravitreal injection of ceftazidime, subconjunctival injection of dexamethasone-gentamycin, and an air bubble injection. Post-surgery, gentamicin ointment was applied, leading to the successful completion of the entire operation.

Although post-surgical visual acuity remained limited to hand movement, there was a significant reduction in IOP (19–35 mmHg) and improvement in both anterior and posterior segment inflammation. The meticulous execution of these surgical procedures underscores the complexity and interdisciplinary nature of managing such cases, emphasizing the need for tailored surgical interventions to optimise outcomes.

SMALL EYE WITH BIG SURPRISE

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Cataract surgery in a nanophthalmic eye has its own challenges intra- and postoperatively. These challenges increase with intraoperative surprises. We present one such intra-operative surprise we encountered while operating in a nanophthalmic eye. A 60-year-old nanophthalmic patient of axial length 16.80 mm presented to us with very shallow anterior chamber depth, non-dilating pupil and significant cataract obscuring the view to fundus. Before performing cataract surgery, a prophylactic posterior sclerotomy was performed to prevent uveal effusion. During capsulorhexis, an intraocular contact lens was noted over the lens, which was removed, after which the cataract surgery continued. A high refractive power intraocular lens with a thickness of one-tenth the usual IOL power was implanted. Postoperatively, the patient was doing well, and anterior chamber depth improved significantly. Prior preoperative planning is important in complex eyes which helps in dealing intraoperative surprises efficiently.

AHMED GLAUCOMA VALVE SLICING

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Introduction

The Ahmed Glaucoma Valve (AGV) has an important role in the management of complicated and refractory glaucomas. It was designed to minimise postoperative hypotony by adding a valve mechanism to maintain a more predictable IOP. Despite its effectiveness, a hypertensive phase and late IOP rise due to fibrosis can occur, necessitating alternative interventions when AGV fails to control IOP.

The various available options when an AGV fails are:

- Bleb needling has a limited success rate and blebs prone to fibrose over time.
- Excisional bleb revision removes the fibrotic tissue around the reservoir, preserving conjunctiva in other quadrants for potential future surgical procedures. However, its long-term efficacy is uncertain.
- Trabeculectomy is a possibility but may be difficult in scarred conjunctiva.
- Implantation of another glaucoma drainage device will involve extensive conjunctival dissection and may be challenging in eyes with a history of multiple surgeries.
- Trans-scleral cyclophotocoagulation has unpredictable results and is typically reserved for the eyes with poor visual potential.

Exploring a Novel Approach

AGV slicing can be considered in such patients who have undergone multiple surgeries and have scarred conjunctiva. A specially designed blade can be used to incise the valve leaflets, thereby converting a flow restrictive device into a non-flow restrictive one.

Conclusion

AGV slicing is found to be a promising option in patients with failed AGV with scarred conjunctiva before going for a second implant or cyclodestructive procedure.

TRABECULECTOMY POST ICL GLAUCOMA

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Short description

Implantable collamer lens (ICL) implantation is a popular choice for refractive correction in young myopic individuals, with advantages such as rapid visual recovery, high efficacy, and reversibility. Although a safe procedure, position of the ICL along with other factors may contribute to complications such as cataract formation, postoperative intraocular pressure (IOP) elevation, and endothelial cell loss. The development of secondary glaucoma is a serious complication following phakic posterior chamber ICL implantation. Raised IOP accounts for 4.4% of postoperative complications and is multifactorial. The early postoperative rise in IOP following ICL implantation is most often transient and is managed conservatively. Although less frequent, prolonged rise in IOP needing long-term antiglaucoma medications and/or surgical intervention have also been reported.

Understanding the mechanisms of postoperative raised IOP (open angle: steroid response, pigment dispersion, retained viscoelastic, pre-existing juvenile open angle glaucoma; angle closure: pupillary block, non-pupillary block angle closure due to oversized ICL, reversed ICL) is important to plan appropriate treatment and prevent long-term sight-threatening complications of glaucoma. The management may vary from medical to trabeculectomy to explantation of ICL.

In this video, we present 2 cases that underwent trabeculectomy with appropriate modifications that helped in achieving IOP control. Avoiding intraoperative and postoperative hypotony is important to prevent complications in these highly myopic eyes. Pigment dispersion due to intraoperative manipulation or shallow anterior chamber should be avoided. Slow decompression, anterior chamber

reformation, releasable sutures, judicious use of mitomycin C, intra- and postoperative cycloplegia are important in preventing complications in these eyes.

OPTIMIZING OUTCOMES: A DUAL SURGICAL APPROACH FOR COMBINED MECHANISM GLAUCOMA AND CATARACT WITH PSEUDOEXFOLIATION SYNDROME

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In this intricate case, we confronted a patient with uncontrolled intraocular pressure (IOP), and cataract with pseudoexfoliation syndrome. Under general anaesthesia, the cataract surgery began with a side port incision and maintaining pupil dilatation using epinephrine. Trypan blue dye stained the anterior lens capsule, and Sodium hyaluronate maintained stability of the anterior chamber. We then navigated through hydrodissection, hydrodelineation, after meticulous construction of a 5mm continuous curvilinear capsulorhexis. The Oertli OS 3 machine facilitated emulsification and aspiration of the lens nucleus, with distinct parameters for sculpting and chopping.

In a superior approach, we proceeded to the trabeculectomy part of the surgery. Subconjunctival lidocaine with epinephrine injection prevented bleeding and ballooned the conjunctiva. After judicious placement of a corneal traction suture. A fornix-based incision crafted a 3.5 mm x 3.5 mm scleral flap. Mitomycin-C-soaked sponges were applied and played a pivotal role in preventing scar tissue formation. Using a 15-degree ophthalmic microsurgical stab knife, we probed the anterior

chamber, followed by removal of a scleral block using a Kelly punch. Peripheral iridectomy with Vannas scissors avoided sclerotomy site blockage.

The operative phase concluded with suturing the scleral flap in place using pre-positioned nylon sutures. The conjunctiva was approximated and sutured in a purse-string and horizontal mattress pattern. Residual ophthalmic viscosurgical device was aspirated and Seidel's test detected no leaks, Postoperative care included corticosteroids and antibiotics. In the ensuing days, vigilant monitoring revealed improvement in visual acuity and reduction in IOP, substantiating the effectiveness of the combined cataract surgery and trabeculectomy.

MIGS SKILLS TO RESCUE TRABECULECTOMY BLEBS

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Trabeculectomy has long been a cornerstone of glaucoma surgical management. Over time, some procedures fail, resulting in flat blebs and uncontrolled intraocular pressure. Traditional external bleb revision, though effective, often requires clear visualization of the scleral flap, which isn't always feasible. Intraoperative OCT, a modern solution, is expensive, requires refocusing, and may not accurately discern the old scleral flap boundaries.

As a solution, the video delves into the potential of minimally Invasive glaucoma surgery (MIGS) techniques, such as operative gonioscopy, to rejuvenate previously unsalvageable trabeculectomy blebs. The video showcases an internal bleb revision method, where the surgical gonio lens is utilized to guide procedures like sclerostomy recanalization and scarred subconjunctival tissue dissection. Two case studies are presented: a 28-year-old bleb and a 4-year-old bleb, highlighting the efficacy of this approach. With modern MIGS skills and tools, there's a renewed hope for reviving failed blebs.

Oral Presentations

SAFETY AND EFFECTIVENESS OF THE PRESERFLO MICROSHUNT DEVICE IN ASIAN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA

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Introduction

This study aims to gather safety and effectiveness data on the Preserflo MicroShunt (PM) device in Asian patients with primary open-angle glaucoma.

Methods

This was a prospective, single arm study of subjects receiving PM with mitomycin C 0.4 mg/ml for 3–4 minutes from March 2021 to August 2022 at a tertiary eye centre in Singapore. Twenty-eight eyes were included. Surgical success for patients with baseline intraocular pressure (IOP) ≤ 21 mmHg was defined as an IOP reduction of ≥ 20%. For patients with baseline IOP > 21mmHg, success was measured as IOP < 21 mmHg and IOP reduction of ≥ 20%. Qualified and complete success were defined as achieving IOP target with and without medications. Definition of failure was when IOP reduction was not met at 2 consecutive time points or when bleb revision or another filtration surgery was performed.

Results

There were 10 eyes that had PM and 18 eyes that had combined phacoemulsification and PM (phaco-PM). The median baseline IOP was 20.5 mmHg, and the median baseline medication load was 3.0. At 6 and 12 months, the complete success rate was 57.1% and 50.0%, respectively. Qualified success at 6 and 12 months was 78.6% and 71.4% respectively. The reduction in median IOP was from 20.5mmHg to 14mmHg at 6 months ($p < 0.001$) and 12 months ($p=0.001$). The reduction in median

number of medications was from 3 to none at 6 and 12 months ($p < 0.001$). The hazard ratio (HR) of failure for complete success was 12.72 (1.65–98.21) in the phaco-PM group as compared to standalone PM. There were no intraoperative complications. Postoperative adverse events requiring intervention occurred in 6 (21.4%) eyes. One eye required an open revision of the PM, 2 eyes required trabeculectomy, and the rest had bleb needling or injection with antimetabolite.

Conclusion

The PM is a safe and effective surgical procedure that reduces IOP and burden of glaucoma medications.

PHASE 3 CLINICAL TRIALS OF IDOSE TR (TRAVOPROST INTRAOCULAR IMPLANT) VERSUS TOPICAL TIMOLOL

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Introduction

Phase 3 clinical trials (GC-010, GC-012) were performed to evaluate the safety and efficacy of travoprost intraocular implants [slow-eluting (iDose TR) or fast-eluting] versus timolol maleate ophthalmic solution, 0.5% in patients with open-angle glaucoma (OAG) or ocular hypertension (OHT).

Methods

The multicentre, randomised, double-masked trials enrolled patients with OAG or OHT, on 0 to 2 IOP-lowering medications at screening. Entry criteria included mean diurnal IOP of ≥ 21 mmHg and IOP ≤ 36 mmHg after washout. A total of 385 fast-eluting implants, 380 iDose TR, and 385 timolol patients were randomised. Primary efficacy endpoint was non-inferiority to timolol based on IOP change from baseline at Day 10, Week 6, and Month 3. Safety was evaluated through Month 12.

Results

Mean IOP reductions over 3 months with iDose TR were 6.6 to 8.5 mmHg and 6.7 to 8.4 mmHg in GC-010 and GC-012; 6.6 to 8.4 mmHg and 6.2 to 8.3 mmHg in fast-eluting implant, respectively. For the timolol groups, IOP reductions were 6.5 to 7.7 mmHg and 6.8 to 7.2 mmHg, respectively. At Month 12, 93% of iDose TR versus 67% of timolol patients were well-controlled on same or fewer medications compared to screening. 81% of iDose TR patients were medication free. There were no reports of clinically significant endothelial cell loss, periorbital fat atrophy, or serious corneal adverse events.

Conclusion

iDose TR was non-inferior to topical timolol in IOP lowering efficacy, with a favourable safety profile and high proportion of patients remaining well controlled on the same or fewer medications compared to screening.

MULTICOLOR™ IMAGING FOR IDENTIFYING GLAUCOMATOUS RETINAL NERVE FIBER LAYER DEFECTS IN GLAUCOMA AND GLAUCOMA SUSPECTS

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Introduction

The MultiColor™ module of the Spectralis™ imaging platform provides 3 monochromatic images and a consolidated MultiColor image clearer than conventional fundus photograph by using laser beams at different depths. This study aims to determine whether glaucomatous retinal nerve fiber layer (RNFL) defects are better identified with MultiColor imaging versus fundus and red-free photography.

Methods

This diagnostic accuracy study aimed to identify glaucomatous RNFL defects with fundus/red-free photographs and MultiColor images. Retrospective chart review of glaucoma patients and suspects was done. Fundus, red-free, and MultiColor images were presented without identifiers to glaucoma specialists to identify glaucomatous RNFL defects. The diagnostic gold standard was clinical diagnosis by a glaucoma specialist.

Results

One hundred twenty-four eyes of 87 patients were included. Diagnostic sensitivities were significantly higher for MultiColor green, blue reflectance, and composite images compared to fundus photographs (43.24%, 40.00%, 38.96%, versus 15.62%). Infrared imaging had significantly lower specificity compared to fundus photographs and red-free images (97.53% versus 99.21%, 97.81%). Fundus photographs had the highest Positive Predictive Value (90.91%). MultiColor™ green reflectance images had the highest Negative Predictive Value (75.44%). All

modalities had high Positive Likelihood Ratio values (4.84–19.69). Green reflectance had the lowest Negative Likelihood Ratio (0.61). Overall, intraobserver agreement was moderate to substantial (κ: 0.37-0.58). Green and blue reflectance images had moderate interobserver agreement (κ: 0.46, 0.40).

Conclusion

MultiColor^{T} green reflectance, blue reflectance, and composite images were better than fundus photographs for identifying glaucomatous RNFL defects. MultiColor infrared imaging was inferior to fundus photographs and red-free photographs in identifying normal RNFL.

REAL-WORLD LONG-TERM PATIENT OUTCOMES OF THE HYDRUS MICROSTENT IN CATARACT SURGERY PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA: A CORRELATION STUDY WITH THE HORIZON TRIAL

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Introduction

Glaucoma, the leading cause of irreversible blindness globally, affects over 70 million people. The Hydrus Microstent, a minimally invasive device used during cataract surgery, demonstrated effectiveness in the Horizon Trial. However, real-world long-term patient outcomes need thorough evaluation. This study assesses the Hydrus Microstent's real-world long-term outcomes in cataract surgery patients with primary open angle glaucoma, comparing these with Horizon Trial results using data extracted from the International Glaucoma Surgery Registry.

Methods

An observational study involving 200 participants with primary open-angle glaucoma who underwent cataract surgery with Hydrus Microstent implantation. Primary outcome measure is the mean change in the number of classes of topical IOP-medications from baseline over 12 and 24 months. Secondary outcomes include mean IOP-lowering medication use, percentage of subjects not using IOP-lowering medication, and change in IOP compared to baseline.

Results

The registry commenced in 2020 and involves participants from various global regions, designed to follow the outcomes for a minimum of 12 months and up to 24 months. Interim results indicate trends in medication reduction and IOP change consistent with the Horizon Trial outcomes. The ongoing analysis will generate

comprehensive analytics and reports of outcomes for each participating site and the entire study cohort.

Conclusion

This study aims to validate the long-term efficacy of the Hydrus Microstent in a real-world setting, thereby supporting informed clinical decisions for treating glaucoma in cataract surgery patients.

A 12-MONTH RETROSPECTIVE STUDY OF EYES WITH THE PAUL GLAUCOMA IMPLANT WITH FLOW RESTRICTION TECHNIQUES

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Introduction

This study aims to present an institutional experience on the outcomes of the PAUL Glaucoma Implant (PGI), and to assess for factors associated with the need for intraluminal stent removal.

Methods

This is a retrospective review of 12-month outcomes in all patients who underwent PGI implantation with flow restriction techniques in a single tertiary institution. Variables of interest included patient demographics, diagnosis, intraocular pressure (IOP), number of glaucoma medications, stent removal, and complications.

Results

Between 2018 and 2022, 100 eyes of 93 patients fulfilled the inclusion criteria. The mean age was 63.7 years, and 77 eyes (77.0%) had primary glaucoma. The postoperative IOP at 12 months (13.5 ± 3.3 mmHg) was significantly lower than the preoperative IOP (21.4 ± 6.0 mmHg; $p < 0.001$). The mean number of glaucoma medications was reduced from 3.2 ± 0.9 preoperatively to 0.3 ± 0.8 at postoperative month 12 ($p < 0.001$). Complications included hyphaema (14.0%) and choroidal detachment (12.0%) which resolved with conservative management; shallow anterior chamber requiring reformation with Viscoat (n = 3); tube occlusion by iris (4.0%), vitreous (1.0%), and inflammatory membranes (1.0%) treated with laser; and tube exposure (1.0%).

The 6-0 polypropylene intraluminal stent was removed in 37 patients (37.0%) at a mean of 14.7 ± 12.2 postoperative weeks; 30 patients (81.1%) had stent removal by postoperative week 24. The mean IOP reduction after stent removal was 6.3 ± 5.3 mmHg (from 18.5 ± 3.9 to 12.2 ± 4.3 mmHg; $p < 0.001$). Patients with stents eventually removed had a higher mean IOP at 1 month postoperatively (14.7 ± 4.5 mmHg vs 11.7 ± 4.4 mmHg; $p = 0.003$). There were no complications following stent removal.

Conclusion

PGI with aqueous flow restriction techniques is an effective and safe treatment for primary and secondary glaucoma, with a sustained reduction of IOP and number of medications at 12 months post-surgery. A higher IOP at postoperative month 1 was significantly associated with the need for stent removal.

COMPARISON OF GCC PARAMETERS IN GLAUCOMA PATIENTS WITH PROGRESSION AND STABLE FIELDS

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Introduction

Focal loss of ganglion cell complex (GCC) was demonstrated as the strongest single predictor of visual field progression.[1] The inferior GCC thickness was found to be significantly thinner in the patients showing fast progression.[2] Thus, change in GCC parameters were assessed in glaucoma patients over the period of 5 years.

Methods

One hundred consecutive glaucoma patients with good quality OCT (SSI > 40) and reproducible visual fields were included in the study. GCC analysis, both qualitative and quantitative, was done by RTvue (FD-OCT system). GCC parameters were compared between the groups having stable VFA (n = 50) and progression on GPA (n = 50) using Wilcoxon signed rank test

Results

Average GCC decreased by 5% ± 4.08 (range 0.6 % to -14.4%) and Inferior Average GCC decreased by 5% ± 0.05 (0.6% to -18%) in patients with stable VFA whereas patients with progressing fields showed 8.7% ± 8.73 (-0.4% to -34.6%) decrease in average GCC and 8.53 % ± 8 (1.8 % to -34.7%) decrease in inferior GCC. In patients with stable VFA, mean change in FLV was 0.4 ± 2.4 and mean change in GLV was 3.6 ± 2.6. Patients with progression showed mean change in FLV was 2.12 ±2.2 and mean change in GLV was 7.18 ± 8. Patients with progression on GPA showed significant decrease in FLV ($p = 0.003$) and GLV ($p = 0.001$) compared to stable fields. No significant decrease was seen in average GCC ($p = 0.90$) and inferior GCC ($p = 0.080$).

Conclusion

Significant decrease in FLV and GLV was observed in patients showing field progression. Thus, FLV and GLV might be considered as better indicators of visual field progression as compared to average GCC and Inferior GCC.

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OUTCOMES FROM THE AUSTRALIAN COMBINED PHACOEMULSIFICATION AND 3 ISTENT W CLINICAL TRIAL

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Introduction

To report intermediate outcomes from the trial of 3 iStent Inject W combined with phacoemulsification for management of cataract and glaucoma.

Methods

In this prospective, multicentre study, patients with cataract and glaucoma underwent phacoemulsification combined with 3 iStent Inject W. Outcomes of interest included change in intraocular pressure (IOP), change in medication, and adverse events up to 24 months following surgery. Outcomes up to 18 months after surgery are available so far.

Results

Ninety-three eyes from 61 patients underwent surgery with outcomes available for the 6-month (n = 77), 12-month (n = 63,) and 18-month (n = 25) follow-up. Baseline IOP and number of medications was 15.99 mmHg and 1.79, respectively, with mean cup-disc ratio of 0.72 and a visual field mean deviation -3.48 dB. Mean IOP and mean number of medications were reduced by 21.1% and 50.8%, respectively, at 6 months and reductions were maintained out to 18 months (21.0% and 58.7%, respectively). There have been no stent-related complications documented at either of the 3 follow-up visits so far.

Conclusions

Intermediate results from this prospective study show cataract surgery combined with 3 iStent Inject W is associated with significant IOP and medication reduction up

to 18 months after surgery. No stent-related complications have been identified so far.

COMPARING OUTCOMES OF COMBINED PHACOEMULSIFICATION AND ISTENT INJECT TO PHACOEMULSIFICATION ALONE FROM THE FIGHT GLAUCOMA BLINDNESS REGISTRY

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Introduction

To utilise the Fight Glaucoma Blindness (FGB) registry to compare outcomes from combined phacoemulsification and iStent inject to phacoemulsification alone.

Methods

The FGB was searched for eyes that had undergone phacoemulsification and iStent Inject (phaco-iStent) or phacoemulsification alone (phaco-only) and outcomes were compared in terms of change in intraocular pressure (IOP), change in medication, and adverse events up to 24 months following surgery.

Results

A total of 772 eyes from 518 patients who had phaco-iStent were compared to 143 eyes from 116 patients who had phaco-only. Baseline IOP was 16.2 mmHg for each group, baseline medications were 1.4 and 1.6 for the phaco-iStent and phaco-only groups, respectively, and visual field mean deviation was -4.6dB and -7dB, respectively. After 24 months, the mean IOP had reduced by 12.3% in the phaco-iStent group and 4% in the phaco-only group, whereas mean medication had reduced by 58% in the phaco-iStent eyes and 7.2% in the phaco-only eyes. No significant stent-related complications were documented, and overall rate of complications was low and comparable between groups.

Conclusions

Data from the FGB shows IOP lowering and medication lowering is greater in eyes receiving phaco-iStent compared to eyes that received phaco-only.

GENETIC VARIANTS ASSOCIATED WITH A RARE PHENOTYPE OF CENTRAL KERATOPATHY IN NEONATAL ONSET CONGENITAL GLAUCOMA

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Introduction

This study aimed to elucidate the genetic underpinnings of neonatal onset congenital glaucoma in children exhibiting dense corneal haze and central corneal opacity.

Methods

Children diagnosed with neonatal onset primary congenital glaucoma (PCG) characterised by severe corneal haze, who underwent surgical management were genetically evaluated using a next-generation sequencing-based whole exome sequencing approach.

Results

Thirty-two eyes (16 children) presenting with severe corneal haze (mean ± SD: 4.25 ± 0.7) and neonatal onset PCG underwent surgery at a median age of 0.28 months (0.14, 0.67). The mean preoperative intraocular pressure (IOP) measured 26.6 ± 8.9 mmHg and horizontal corneal diameter (HCD) was 12.1 ± 1.57 mm. Initial surgeries included combined trabeculotomy and trabeculectomy in 28 eyes, trabeculectomy in 2 eyes, and laser cyclophotocoagulation in 1 eye. Twenty-seven eyes (84%) exhibited dense central corneal scars and no Haab's striae. Most eyes presented with dilated pupils and ectropion uveae (94% eyes). Over a median follow-up of 2.5 years, an average of 1.9 ± 0.8 glaucoma surgeries were performed, with 18 eyes (56%) requiring glaucoma drainage device implantation. The mean cup-disc ratio was 0.59 ± 0.1. Genetic analysis revealed that 12 out of 16 cases exhibited homozygous variants in the *CYPB1B1* gene, while the remaining 4 cases displayed heterozygous variants in the *PITX2*, *FOXC1*, and *TEK* genes. Of note, 11 out of 16 cases

were associated with consanguineous parental marriages. Five novel variants were identified, including a missense variant in *TEK* reported for the first time as a potential cause of PCG in an Indian patient.

Conclusion

This cohort exhibited refractory glaucoma necessitating multiple interventions, smaller corneal diameter, moderate disc damage, dense central corneal scars, and ectropion uveae. The study reaffirms *CYP1B1* as the primary genetic cause for neonatal onset PCG with central corneal opacity (*CYP1B1* keratopathy) in the Indian population. Additionally, *TEK*, *PITX2*, and *FOXC1* variations were infrequently associated with a similar phenotype.

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Figures

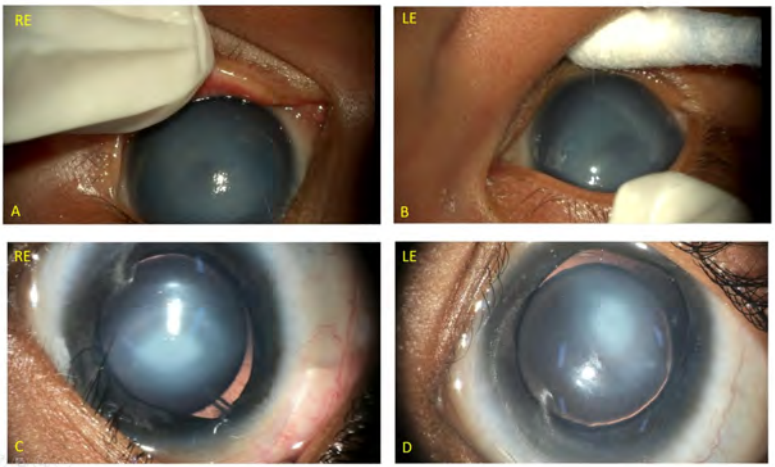

Figure 1. (A,B) Right eye and left eye showing megalocornea, grade 4 corneal haze(more dense in the centre than in the periphery); (C,D:) Right eye and left eye at the last follow-up post trabeculectomy with trabeculotomy, post repeat trabeculectomy and post Ahmed glaucoma valve implantation with corneal oedema cleared the mid-periphery and periphery, but persistent central corneal haze.

ASSOCIATION OF OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY PARAMETERS WITH VISUAL FIELD AND STRUCTURAL PARAMETERS IN SINGLE-HEMIFIELD AFFECTED EYES AND CONTRALATERAL EYES OF PRIMARY OPEN-ANGLE GLAUCOMA PATIENTS

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Introduction

Optical coherence tomography angiography (OCT-A) is used to imaging glaucomatous eyes with documented ONH and peripapillary vasculature attenuation.[1] Vascular factors play a role in the development and progression of glaucomatous nerve damage and visual field loss.[2] The objective of this study is to determine the association of OCT-A vascular parameters with visual field indices and structural parameters among single hemifield affected primary open-angle glaucoma.

Methods

We enrolled 42 eyes of primary open-angle glaucoma eyes with hemiretinal field defects and 42 of healthy eyes in this prospective cross-sectional study. Visual field perimetry, peripapillary retinal nerve fibre layer (pRFNL), macular ganglion cell complex (mGCC), and OCT-A imaging were performed. In both the affected and intact hemifields, the severity of glaucomatous visual field defects was correlated with vascular and structural measurements.

Results

The results show that the average standard automated perimetry (SAP) mean deviation (MD), average SAP pattern standard deviation (PSD), average SAP total deviation (TD), rim area, average pRFNL, average mGCC thickness, average percent perfusion, average flux index (all $p < 0.001$), and average mVD ($p < 0.024$) significantly differ between healthy eyes and glaucomatous eyes. In the affected hemifields, the

strongest associations between mean sensitivity were found with percent perfusion (r = 0.620) and mGCC (r = 0.632), while PSD is highly correlated with mGCC (r = 0.636) followed by percent perfusion (r = 0.495). The TD is correlated with mGCC (r = 0.709) and percent perfusion (r = 0.446). The AUROCs for discriminating between glaucomatous and healthy eyes among the structural and vascular parameters were highest for average pRNFL thickness (0.93) followed by average percent perfusion (0.85).

Conclusion

In summary, our study determined that individuals with bilateral open-angle glaucoma displayed a significant reduction in vessel density within both the macular and peripapillary regions. Peripapillary and macular OCT-A is a valuable additional diagnostic examination in equivocal and early primary open-angle glaucoma patients.

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OUTCOMES OF COMBINED PHACOEMULSIFICATION-MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION VERSUS PHACOEMULSIFICATION-ISTENT INJECT SURGERY IN ASIAN EYES

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Introduction

The purpose is to compare the efficacy and safety of phacoemulsification combined with iStent Inject W (phaco-iStent) and phacoemulsification combined with MicroPulse transscleral cyclophotocoagulation (phaco-MP3) in Asian eyes.

Methods

This is a retrospective cohort study wherein hospital records of patients with open-angle glaucoma and cataract who underwent either phaco-iStent or phaco-MP3 in a tertiary hospital in Singapore were included. Intraocular pressure (IOP), number of antiglaucoma medications, visual acuity (VA), and intraoperative/postoperative complications at 1, 3, 6, and 12 months were recorded and analysed.

Results

Forty-six eyes of 46 patients with mostly primary open-angle glaucoma. (76.1%) were included in the analysis. Twenty-three eyes (group 1) underwent phaco-iStent and 23 (group 2) had phaco-MP3. The baseline medicated IOPs were similar in both groups (16.6 ± 3.6 mmHg in group 1 and 16.8 ± 3.5 mmHg in group 2; $p = 0.84$). There was no significant difference in mean IOP between the 2 groups 12 months after surgery (group 1: 15.7 ± 3.1 and group 2: 14.5 ± 2.2; $p = 0.16$). The decrease in IOP, pre- and post phaco-MP3 was significant ($p < 0.05$). Group 2 had a higher percent IOP reduction compared to group 1 after 12 months (15.3% for group 2 and 7.4% for group 1, but statistical analysis was insignificant ($p = 0.31$). Both groups achieved significant medication reduction burden ($p < 0.0001$). VA for both groups by month

12 were comparable (p = 0.13). Postoperative complication rates were similar in both groups.

Conclusion

Both groups showed decrease in IOP and reduction in antiglaucoma eyedrops after 12 months. However, only the phaco-MP3 group demonstrated significant reduction in IOP over 1 year when compared to baseline IOP. Both procedures had good safety profiles.

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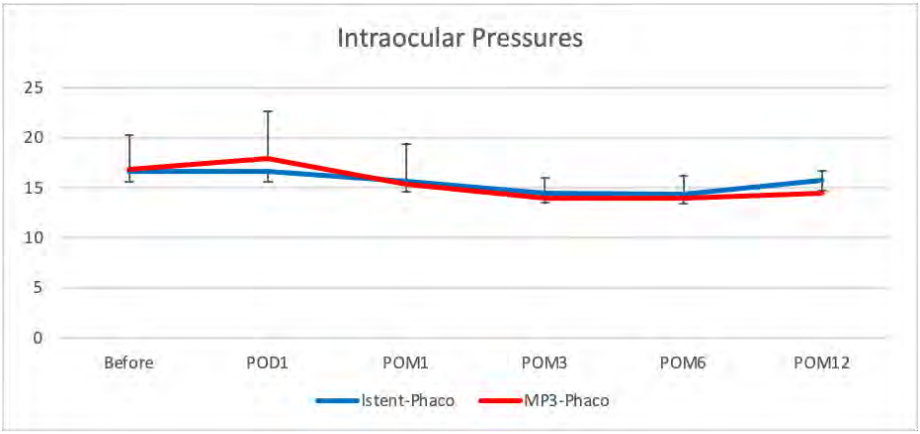
Tables, Figures, and Illustrations

Table 1. Study Demographics			
	Phaco iStent **(n = 23)**	Phaco MP3 **(n=23)**	*p*-value
Mean age (SD) in years	70.6±9.0	74.8±8.9	0.11
Gender (M/F)	13/10	14/9	0.76
Race			
Chinese	20	20	
Indian	1	1	
Malay	2	0	
Others	0	2	
Glaucoma Type			0.62
POAG	16	19	
OHT	5	3	
PXG	1	0	
Pigmentary Glaucoma	1	1	
Pre-Op IOP	16.6±3.6	16.8±3.5	0.84
Pre-Op Medications	1.1±0.5	1.52±0.6	0.02
Pre-Op log MAR BCVA	0.26±0.12	0.39±0.18	0.0036

SD, standard deviation; M/F, male/female; POAG, primary open-angle glaucoma; OHT, ocular hypertension; PXG, pseudoexfoliation glaucoma; IOP, intraocular pressure

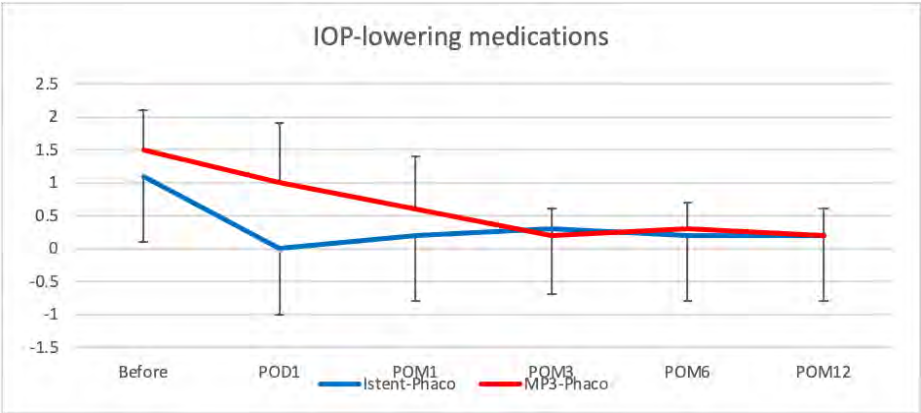
Table 2. Results					
	Phaco iStent	*p*-value Pre-Op vs.	Phaco MP3	*p*-value Pre-Op vs.	*P-value Phaco Istent vs. Phaco Mp3*
Intraocular Pressure					
Pre-Op	16.6±3.6		16.8±3.5		0.84
POD1	16.6±7.8		17.9±4.7		0.48
POM1	15.6±3.9		15.3±4.1		0.8
POM3	14.5±3.5		14.0±2.0		0.62
POM6	14.4±3.6		14.0±2.2		0.72
POM12	15.7±3.1		14.5±2.2		0.16
IOP Reduction (%)					
POD1	-3.8±51.2	0.98	-10.0±34.6	0.38	0.63
POM1	7.8±29.9	0.28	6.3±25.6	0.20	0.85
POM3	20.7±36.5	0.048	21.5±29.8	0.004	0.94
POM6	17.0±26.2	0.003	14.1±17.6	0.003	0.66
POM12	7.4±26.5	0.19	15.3±26.0	0.014	0.31
Medications					
Preop	1.1±0.5	N/A	1.52±0.6	N/A	0.02
POD1	0.0±0.2	<0.0001	1.0±0.9	0.004	<0.0001
POM1	0.2±0.6	<0.0001	0.6±0.8	<0.0001	0.12
POM3	0.3±0.7	<0.0001	0.2±0.4	<0.0001	0.74
POM6	0.2±0.7	<0.0001	0.3±0.4	<0.0001	0.85
POM12	0.2±0.7	<0.0001	0.2±0.4	<0.0001	1
Visual Acuity					
Preop	0.26±0.12		0.39±0.18		0.0036
POM1	0.10±0.11		0.30±0.22		0.0004
POM3	0.11±0.11		0.17±0.14		0.14
POM6	0.08±0.09		0.16±0.14		0.0396
POM12	0.05±0.07		0.15±0.28		0.13

Pre-op, preoperative; POD, postoperative day; POM, postoperative month; IOP, intraocular pressure



POD, postoperative day; POM, post-operative month

Figure 1. IOP in the 2 study groups.



POD, postoperative day; POM, post-operative month

Figure 2. IOP lowering-medications in the 2 study groups.

BASELINE VISUAL FIELD DAMAGE IN PATIENTS WITH GLAUCOMA IN ASIA: A REPORT FROM THE ASIAN GLAUCOMA REGISTRY

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Introduction

This inaugural Asian Glaucoma Registry (AGR) assembles data to advance the understanding of glaucoma, its progression, and management patterns in Asia. This report outlines the baseline visual field status in Asian patients with glaucoma.

Methods

The AGR is a multicentre collaboration of 13 study sites in 11 Asian countries (Hong Kong China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, Vietnam). Clinical data of 260 patients (392 eyes) who had VF testing at least once a year over 5 years in the registry were analysed. Mean of Mean Deviations (MD) were compared between countries and severity was classified on the basis of MD.[1]

Results

Among 260 patients with glaucoma, 29.3% had normal-tension glaucoma (NTG), 58.0% had primary open-angle glaucoma (POAG), and 12.7% had primary angle-closure glaucoma (PACG). The mean (SD) age, intraocular pressure (IOP), central

corneal thickness, axial length, and VF MD at the baseline visit was 51.7 (14.8) years, 18.8 (6.4) mmHg, 530 (60) µm, 25.1 (3.0) mm, and -6.63 (6.45) dB, respectively. The severity of glaucoma at the baseline visit varied widely from -4.2 dB (SD:3.9) in Hong Kong to -12.1 dB (SD: 8.2) in India. In 4 countries, the mean baseline damage was classified as mild (Hong Kong, Korea, Philippines, and Taiwan), in 6 countries (Singapore, Japan, Indonesia, Malaysia Vietnam, Thailand) as moderate, and severe in India. There were no statistically significant differences in mean IOP at baseline between all 3 severity groups. The moderate damage group was significantly older than the mild group (53 [SD: 15] years vs 57 [SD: 14] years, p = 0.013). Age and baseline IOP were not significantly correlated with baseline MD.

Conclusion

There exists wide variation in glaucoma severity at presentation in the Asia-Pacific region.

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SAFETY AND EFFICACY OF GONIOTOMY FOLLOWING FAILED SURGERY FOR GLAUCOMA

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Introduction

To evaluate the efficacy and safety of goniotomy (GT) in patients with prior failed surgery for glaucoma.

Methods

A prospective, observational, multicentre study was performed for patients who underwent GT with prior single or multiple surgery for glaucoma. Outcome measures included intraocular pressure (IOP) change, best-corrected visual acuity (BCVA) change, ocular hypotensive medication use, and occurrence of adverse events through 12 months. Complete success was defined as a postoperative IOP within 6 to 18 mmHg and a 20% reduction from baseline without ocular hypotensive medications. Qualified success was the same as the definition of complete success, except for postoperative use of medication. Logistic regression models were used to investigate the potential factors for surgical success.

Results

A total of 38 eyes of 34 patients were included. Twenty-three eyes had only 1 prior surgery, 13 eyes had 2 prior surgeries, 1 eye had 3 prior surgeries, and 1 eye had 4 prior surgeries. At month 12, there was complete success in 42.1% of the eyes and qualified success in 78.9% of the eyes. Preoperatively, the mean IOP was 29.4 ± 6.9 mmHg and the median number of glaucoma medications used was 3.0 (2.0, 4.0); this decreased to 16.7 ± 3.6 mmHg (43.2% reduction; $P < 0.001$) and 2.0 (0.0, 3.0) ($P < 0.001$) at month 12, respectively. The most common complications included

hyphaema (13.2%), IOP spike (7.9%), and corneal oedema (5.2%). Older age significantly contributed to surgical success.

Conclusion

GT appears to be a safe and effective procedure for patients with prior failed surgery for glaucoma.

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TWO-YEAR POST-MARKET SURVEILLANCE OF SAFETY AND CLINICAL OUTCOMES OF ISTENT INJECT® W COMBINED WITH PHACOEMULSIFICATION IN JAPANESE EYES WITH OPEN-ANGLE GLAUCOMA

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Introduction

The Japanese government stipulates post-market surveillance of new medical device entrants.[1]We report the 2-year safety, clinical outcomes, and success of iStent Inject W combined with phacoemulsification in adult eyes with mild to moderate open-angle glaucoma (OAG).

Methods

Patient baseline characteristics and adverse events, intraocular pressure (IOP), and number of glaucoma medications at postoperative day 1, week 1, and months (POM) 1, 3, 6, 12, and 24 were recorded. Success at POM24, evaluated from POM3 onwards, was defined as achieving lower IOP on same or fewer medications as preoperative or same IOP on fewer medications as preoperative. Statistical analysis on differences between POM24 and preoperative values included one-sample t-test for continuous variables and Wilcoxon signed-rank test for count variables. $P < 0.05$ indicated statistical significance.

Results

Among 211 eyes in the efficacy population, 49% were primary OAG, 46% were normal-tension glaucoma and 5% were exfoliation glaucoma. Statistically significant reductions in IOP and medications were achieved at all time points (POM24: mean -2.2 mmHg/-1.3 medications; both $P < 0.001$; Figure 1). Similar trends were observed in glaucoma subtypes. Success was 93%. The incidence of adverse events was 7.9% (safety population, n = 216), with “IOP increase” being the most

common at 2.8%. Stent-related issues occurred in 6.0% of eyes, of which stent occlusion was the most frequently observed (4.2%). Only 2.3% of eyes required additional glaucoma interventions.

Conclusion

In Japanese eyes, iStent Inject W combined with phacoemulsification safely relieved medication burden with additional IOP reductions across different OAG subtypes over 2 years.

References

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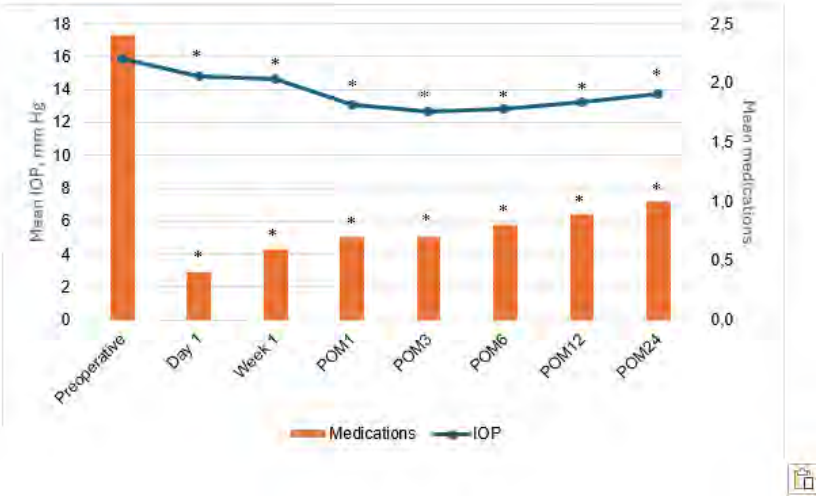
Figures

Figure 1. Observed mean IOP and medications over 2 years.



GENETIC CHARACTERIZATION OF OCULAR ANOMALIES: LTBP2 MUTATIONS AND A UNIQUE OCULAR PROFILE

Indu Pavani V[1], Senthil S[1], Parameshwarappa D[1]

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Introduction

This study aimed to uncover the genetic basis of a distinctive ocular condition featuring congenital megalocornea, persistent pupillary membrane, gross iridodonesis, ectopia lentis, and secondary glaucoma.

Methods

An 18-child cohort from 14 consanguineous families (age: 4 months to 12 years) underwent comprehensive ocular assessments and genetic analysis using whole-exome sequencing validated by Sanger sequencing.

Results

The cohort consistently displayed megalocornea, ectopia lentis, gross iridodonesis (100%), and high incidences of persistent pupillary membrane (78%), Ectropion uveae (19%), and secondary glaucoma (72%). Lensectomy effectively controlled intraocular pressure when treated before 2 years of age. Glaucoma surgery was required in 36% of eyes. Concurrent retinal issues affected 36% of eyes, with 20% developing retinal detachment after lensectomy or glaucoma surgery, and 5% experiencing suprachoroidal haemorrhage following glaucoma surgery. Genetic analysis identified pathogenic *LTBP2* gene variations in all 18 children, including missense, duplications, and deletions. These variations were uniform among affected siblings and were not found in population genome databases. These variations likely affect microfibril and elastin fiber functions, causing the typical phenotypic changes.

Conclusion

This study emphasizes the need to distinguish this unique ocular phenotype linked to *LTBP2* genetic mutations from primary congenital glaucoma. Early clinical diagnosis, targeted genetic testing, and lensectomy are crucial. Comprehensive retinal assessment and prophylactic laser therapy can help prevent vision-threatening complications. This research contributes to our understanding of this distinct ocular condition and its genetic underpinnings.

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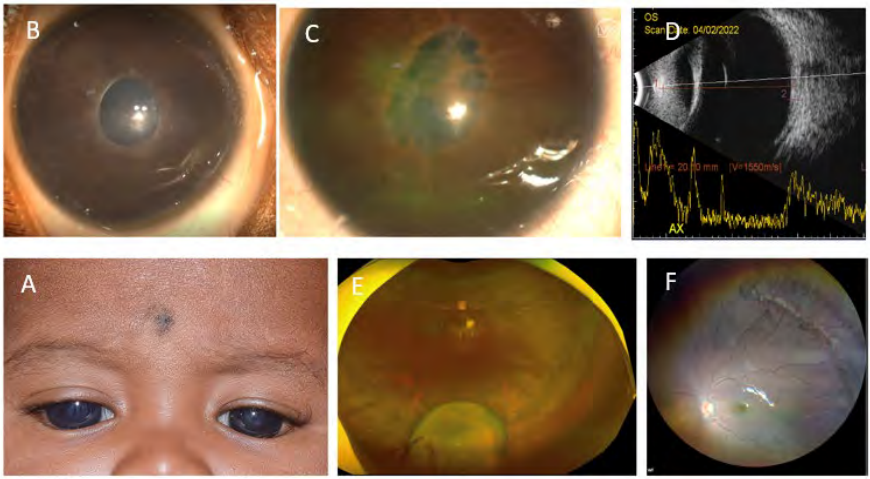
Figures



A 4-month-old child with BE congenital megalocórnea. (A) Pupillary membrane (B,C) gross iridodonesis, zonular weakness with subluxation/posterior dislocation of crystalline lens. (D,E), Peripheral retinal degeneration (F) with or without secondary glaucoma. A distinct ocular phenotype entity associated with autosomal recessive *LTBP2* mutation.

GLAUCOMA FOLLOWING VITREORETINAL SURGERY: A PRELIMINARY REPORT

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Introduction

Vitreoretinal surgeries (VRS) are recognized for inducing an increase in intraocular pressure (IOP), leading to subsequent risk of developing glaucoma. This study aims to assess the likelihood of open-angle glaucoma (OAG) development after VRS in comparison to eyes that have not undergone such procedures.

Methods

Medical records of 2,750 patients who underwent vitrectomy at Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand from 2013 to 2022 were screened for eligibility. The primary endpoint of interest was the incidence of developing OAG. Comparative analysis was conducted to assess the incidence rates of OAG development between eyes that underwent VRS (VRS cohort) and fellow eyes which did not undergo VRS (non-VRS cohort).

Results

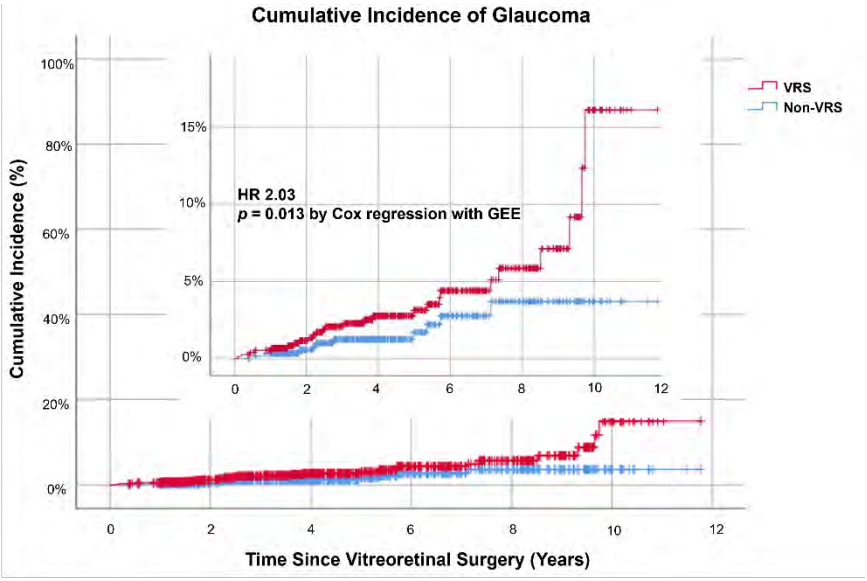
The study included 1,330 eyes from 693 patients, with 743 eyes in the VRS cohort and 587 eyes in the non-VRS cohort. The median age was 64.0 years (IQR 58.0–70.0). Notably, 26 eyes in the VRS cohort developed OAG, in contrast to 10 eyes in the non-VRS cohort. The median time from VRS to the diagnosis of glaucoma was 3.98 (2.25–6.31) years for VRS eyes. The 10-year cumulative probability of developing glaucoma in the VRS cohort was 13.58% (95% CI 7.43%–24.11%), and 3.68% (95% CI 1.75%–7.63%) in the non-VRS cohort. The cog regression analysis with generalized estimating equation indicated that the incidence of glaucoma development in the

VRS cohort was statistically higher than in the non-VRS cohort with a hazard ratio of 2.03 (95% CI 1.15–3.56, p = 0.013)

Conclusion

Individuals who underwent VRS face an elevated risk of developing glaucoma, which may occur at a considerable duration following VRS, with a median time of 3.98 years. Vigilant and extended monitoring is recommended for these patients to detect and manage the potential development of glaucoma.

Figures



OUTCOME OF PAUL GLAUCOMA IMPLANT IN REFRACTORY GLAUCOMA

Konar I, Mathews D

Objectives

To describe the surgical technique and early postoperative outcomes for a novel glaucoma drainage device-the PAUL® Glaucoma Implant (PGI).

Methods

A retrospective evaluation of subjects who had PGI surgery between November 2020 and June 2023 with a 6–24-month follow-up. Primary outcome measures included surgical success rate of PGI defined as IOP of 5–18 mmHg or at least 30% reduction, and qualified success (with or without IOP-lowering drops), at 6, 12, 18 and 24 months.

Results

Twenty-six eyes of 25 patients had a preoperative IOP (mean ± standard deviation) of 32.80 ± 10.76 mmHg, falling to 14.2 ± 6.56 mmHg at 3 months, 15.28 ± 4.88 mmHg at 6 months, 14.2 ± 5.13 mmHg at 12 months, and 14.16 ± 5.53 at 24 months. The mean change in number of medications was a reduction from 4.23± 0.71 to 0.92 ± 1.26 postoperatively ($p < 0.0001$). Eleven out of 26 patients required IOP-lowering drops postoperatively. Complete success of 61.53% at 6 months, 55% at 12 months, 54.50% at 18 months and 33.33% at 24 months was noted. Qualified success was 88.46 % at 6 months, 90% at 12 months, 100 % at 18 months, and 83.33% at 24 months.

Conclusion

This study presents a safe surgical technique that significantly reduces IOP and number of medications with minimal complications.

HOME MONITORING OF GLAUCOMA WITH A DEVICE-INDEPENDENT WEB-BROWSER PERIMETRY SOFTWARE: MELBOURNE RAPID FIELDS (MRF-WEB)

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Background

Previous studies from our group demonstrate that visual field (VF) test can be performed at home with iPad tablets.[1,2] In this study, we examined whether glaucoma patients can perform VF testing using their own home computer device and a web browser device-independent software Melbourne Rapid Fields (MRF-web).

Methods

Eighteen glaucoma patients (30 eyes) were tasked to perform 24-2 VF test at home. Patients were instructed to ensure the screen was ≥ 246 mm (9.7”), how to do a simple calibration step, and to turn the screen brightness to maximum. Webcam computer vision was used to monitor viewing distance. Patients were instructed to complete a weekly test for 4 weeks. The results were compared to previous outcomes on Humphrey Field Analyzer (HFA) SITA-Faster performed in clinic.

Results

Patient age ranged from 46 to 86 (average 66.9, SD 11.27). High concordance was found for Mean Deviation (MD) and Pattern Standard Deviation (PSD), (ICC = 0.95, and 0.85, respectively). Bland-Altman methods found a bias of -0.76 dB for mean deviation (MD, HFA-MRF) and 95% Limits of Agreement of -8.67 dB to 7.16 dB. Similarly, the PSD found a bias of 0.47 dB for PSD with 95% Limits of Agreement of -5.04 dB to 5.98 dB. Test-retest showed high concordance between repeat tests, (ICC range 0.89–0.98) for MD. There was no statistical difference between MRF-web and

HFA in FP% rate (10.7% ± 2.3% vs 7.1% ± 1.5%, p = 0.15), FL% rate (15.1% ± 2.5% vs 12.2% ± 3.3%, p = 0.48) or test time (4.04 ± 0.1 min vs 4.02 ± 0.2 min, p = 0.93).

Conclusion

Novel MRF-web software allows patients to perform VF testing at home using their own computer. This returns comparable outcomes to HFA done in clinic and good test-retest repeatability.

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DIFFERENTIAL RISK FACTORS FOR ANGLE CLOSURE IN CHINESE EYES WITH COMPARABLE SHALLOW ANTERIOR CHAMBER AND SHORT AXIAL LENGTH: INSIGHTS FROM THE HANDAN EYE STUDY

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Introduction

Many normal eyes exhibit anterior chamber depth (ACD) and axial length (AL) similar to those found in primary angle-closure disease (PACD). This study aims to explore the distinctions in anterior chamber, angle, iris, and lens parameters between individuals with PACD and normal eyes sharing comparable central ACD and AL.

Methods

Cross-sectional study. Participants of the Handan Eye Study aged ≥ 35 years with PACD and with normal open angle diagnosed by gonioscopic examination and anterior segment optical coherence tomography (ASOCT) imaging were selected. PACD and normal eyes were 1:1 matched for central ACD and AL, and included for analysis. Demographic information, ocular conditions, and anterior segment parameters were compared between PACD and normal groups.

Results

Of the 2,161 participants, 702 participants with PACD and 702 normal controls were finally enrolled. Following propensity score matching, no statistically significant differences were observed in AL, ACD, average keratometry, absolute lens position, relative lens position, or lens thickness. Despite the matching, statistical significance persisted in age, visual acuity, spherical equivalent, anterior chamber and angle parameters, iris curvature and thickness, and lens vault between the 2 groups akin with central ACD and AL (all $p < 0.001$).

Conclusion

The study's findings emphasize that, even among eyes with comparable short ACD and AL, a smaller anterior chamber and angle area, coupled with thicker and more curved peripheral iris and higher lens vault, significantly contribute to the incidence of angle closure.

Tables and Figures

Table 1. Demographic and biometric characteristics of the PACD and normal participants with similar central anterior chamber and axial lengths

Parameter	1 = Normal (*n* = 702)	2 = PACD (*n* = 702)	*P* value
Age (IR), years	60.0 (57.8, 65.0)	63.0 (58.0, 67.0)	< 0.001†
Gender			
Male (%)	260 (37.0)	216 (30.8)	0.013‡
Female (%)	442 (63.0)	486 (69.2)	
PVA (IR)	0.20 (0.08, 0.36)	0.30 (0.10, 0.40)	< 0.001†
BCVA (IR)	0.00 (0.00, 0.10)	0.00 (0.00, 0.20)	< 0.001†
AK (IR), diopter	44.25 (43.50, 45.25)	44.50 (43.50, 45.50)	0.057†
SE (IR), diopter	0.63 (-0.13, 1.25)	0.75 (0.13, 1.50)	< 0.001†
IOP (IR), mmHg	11.9 (10.2, 13.9)	11.7 (10.2, 13.9)	0.938†
VCDR (IR)	0.30 (0.30, 0.40)	0.30 (0.20, 0.40)	0.265†
CCT (IR), μm	528.0 (513.0, 548.0)	528.0 (513.0, 547.0)	0.419†
Central ACD (IR), mm	2.57 (2.38, 2.76)	2.57 (2.38, 2.76)	0.924†
LT (IR), mm	4.80 (4.47, 5.07)	4.82 (4.40, 5.07)	0.884†
ALP, mm	4.95 (4.79, 5.18)	4.95 (4.78, 5.16)	0.597†
RLP	0.22 (0.21, 0.23)	0.22 (0.21, 0.23)	0.856†
AL (IR), mm	22.47 (22.09, 23.07)	22.42 (21.99, 23.00)	0.166†

PACD, primary angle-closure disease; PVA, presenting visual acuity; BCVA, best-corrected visual acuity; AK, average keratometry; SE, spherical equivalent; IOP,

intraocular pressure; VCDR, vertical cup disc ratio; CCT, central corneal thickness; ACD, anterior chamber depth; LT, lens thickness; ALP, absolute lens position; RLP, relative lens position; AL, axial length; IR, interquartile range.
* Independent t-test. † Mann–Whitney test. ‡ $\chi 2$ test.

Supplement Table 1. Demographic and biometric characteristics of the PACD and normal participants with similar central anterior chamber and axial lengths before propensity score matching

Parameter	1 = Normal (*n* = 1446)	2 = PACD (*n* = 715)	*P* value
Age (IR), years	60(53,65)	63(58,67)	< 0.001†
Gender			
Male (%)	602 (41.6)	218 (30.5)	< 0.001†
Female (%)	844 (58.4)	497 (69.5)	
PVA (IR)	0.2(0.08,0.32)	0.3(0.12,0.42)	< 0.001†
BCVA (IR)	0(0,0.1)	0(0,0.2)	< 0.001†
AK (IR), diopter	44.25(43.25,45.25)	44.5(43.5,45.5)	< 0.001†
SE (IR), diopter	0.38(-0.25,1.13)	0.88(0.13,1.5)	< 0.001†
IOP (IR), mmHg	11.99(10.24,13.87)	11.74(10.24,13.87)	0.499†
VCDR (IR)	0.3(0.2,0.5)	0.3(0.2,0.4)	0.049†
CCT (IR), μm	528(513,547)	528(513,547)	0.391†
Central ACD (IR), mm	2.74(2.51,2.95)	2.57(2.37,2.76)	< 0.001†
LT (IR), mm	4.76(4.38,5.01)	4.82(4.4,5.07)	0.002†
ALP, mm	5.07(4.86,5.31)	4.94(4.78,5.14)	< 0.001†
RLP, mm	0.22(0.22,0.23)	0.22(0.21,0.23)	< 0.001†
AL (IR), mm	22.79(22.19,23.34)	22.4(21.9725,23)	< 0.001†

PACD, primary angle-closure disease; PVA, presenting visual acuity; BCVA, best-corrected visual acuity; AK, average keratometry; SE, spherical equivalent; IOP, intraocular pressure; VCDR, vertical cup disc ratio; CCT, central corneal thickness;

ACD, anterior chamber depth; LT, lens thickness; ALP, absolute lens position; RLP, relative lens position; AL, axial length; IR, interquartile range.
* Independent t-test. † Mann–Whitney test. ‡ χ2 test.

Table 2. Anterior chamber, angle, lens, and iris parameters measured by ASOCT in PACD and normal participants with similar central anterior chamber and axial lengths

Parameter	1 = Normal (*n* = 702)	2 = PACD (*n* = 702)	*P* value
AOD500 (IR), mm	0.192 (0.135, 0.248)	0.111 (0.070, 0.161)	< 0.001†
TISA500 (IR), mm	0.085 (0.063, 0.105)	0.053 (0.037, 0.072)	< 0.001†
ARA (IR), mm^2	0.228 (0.157, 0.312)	0.133 (0.086, 0.194)	< 0.001†
ACW (SD), mm	11.48 (0.40)	11.29 (0.40)	< 0.001*
ACA (IR), mm^2	18.43 (16.84, 20.26)	16.15 (14.57, 17.70)	< 0.001†
ACV (IR), mm^3	74.35 (65.86, 84.00)	62.27 (54.10, 70.35)	< 0.001†
IT750 (SD), mm	0.47 (0.06)	0.49 (0.06)	< 0.001*
IA (IR), mm^2	2.88 (2.63, 3.12)	2.89 (2.65, 3.12)	0.502†
IC (IR), mm	0.29 (0.24, 0.33)	0.31 (0.27, 0.36)	< 0.001†
LV (SD), μm	494.6 (207.0)	646.8 (194.1)	< 0.001*
PD (IR), mm	4.72 (4.22, 5.17)	4.66 (4.17, 5.13)	0.204†

PACD, primary angle-closure disease; AOD500, angle opening distance at 500 μm; TISA500, trabecular-iris space area at 500 μm; ARA, angle recess area at 750 μm; ACW, anterior chamber width; ACA, anterior chamber area; ACV, anterior chamber

volume; IT750, iris thickness at 750 µm; IA, iris cross-sectional area; IC, iris curvature; LV, lens vault; PD, pupil diameter; SD, standard deviation; IR, interquartile range.
* Independent t-test. † Mann–Whitney test.

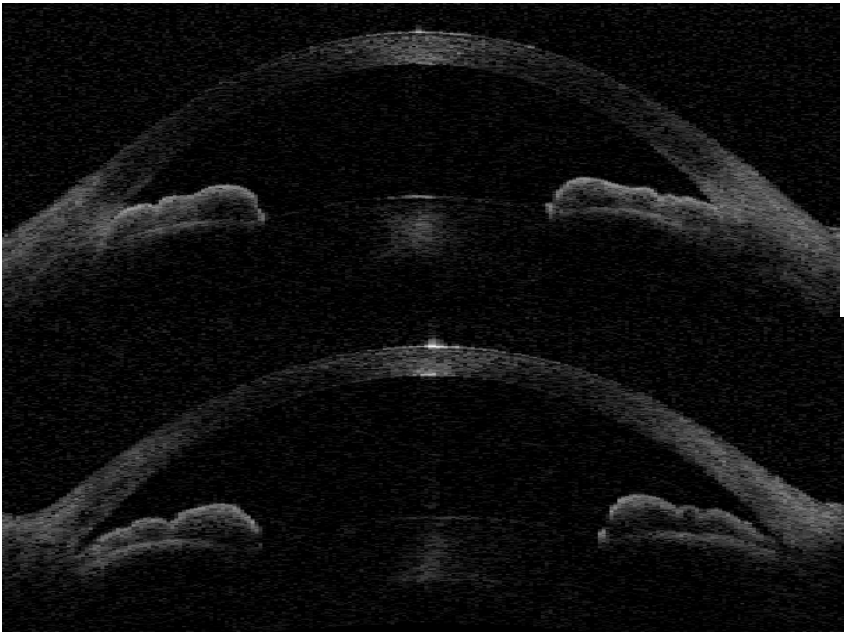
Table 3. Risk factors for PACD in participants with similar central anterior chamber and axial lengths

Variable	Univariate logistic regression		Multivariate logistic regressior		
	OR (95% CI)	P	OR (95% CI)	P value	V
Age (years)	1.039 (1.027, 1.052)	<	1.013 (1.000,	0.043	1.
Female	1.324 (1.060, 1.652)	0.013	----	----	1.
AK (diopter)	1.081 (1.008, 1.160)	0.030	----	----	1.
CCT (µm)	0.998 (0.995, 1.002)	0.292			
LT (mm)	0.967 (0.766, 1.221)	0.778			
ALP (mm)	0.944 (0.682, 1.305)	0.725			
RLP (mm)	2.928 (0.002, 5170.313)	0.778			
TISA500 (0.1	0.021 (0.014, 0.031)	<	0.182 (0.109,	< 0.001	2.
IT750 (0.1 mm)	2.117 (1.817, 2.467)	<	1.868 (1.533,	< 0.001	1.
IA (mm^2)	1.098 (0.829, 1.454)	0.513			
IC (mm)	52.587 (12.390, 223.193)	0.006	----	----	1.
ACV (mm^3)	0.929 (0.920, 0.938)	<	0.951 (0.940,	< 0.001	2.
LV (µm)	1.004 (1.003, 1.005)	<	1.002 (1.001,	< 0.001	2.
PD (mm)	0.943 (0.816, 1.088)	0.421			

PACD, primary angle-closure disease; OR, odds ratio; CI, confidence interval; VIF, variance inflation factor; AK, average keratometry; CCT, central corneal thickness; LT, lens thickness; ALP, absolute lens position; RLP, relative lens position; TISA500, trabecular-iris space area at 500 µm; IT750, iris thickness at 750 µm; IA, iris cross-

sectional area; IC, iris curvature; ACV, anterior chamber volume; LV, lens vault; PD, pupil diameter.

Figure 1. ASOCT images of PACD and normal eyes with similar central ACD and AL



ANGLE-BASED MINIMALLY INVASIVE GLAUCOMA SURGERY IN NORMA- TENSION GLAUCOMA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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[1]National Healthcare Group Eye Institute, Department of Ophthalmology, Tan Tock Seng Hospital, [2]Yong Loo Lin School of Medicine, National University of Singapore

Introduction

The safety and efficacy of angle-based minimally invasive glaucoma surgery (MIGS) in the treatment of primary open-angle glaucoma is well established. Despite not being clinically indicated for use in normal-tension glaucoma (NTG), angle-based MIGS have increasingly been used in this patient population. Hence, this systematic review and meta-analysis aims to quantitatively examine the efficacy of angle-based MIGS in NTG.

Methods

A literature search was performed on Medline, Embase, PubMed, CINAHL, and Cochrane Library from inception until 20 December 2022. Pilot, cohort, observational studies, and randomised controlled trials including at least 5 subjects undergoing angle-based MIGS (trabecular bypass devices, excisional trabeculotomy, goniotomy, and ab-interno canaloplasty) for NTG, with or without cataract surgery, were included for review. Meta-analysis of continuous outcome using the meta routine in R version 2022.12.0+353 was performed to determine mean intraocular pressure (IOP) and antiglaucoma medication (AGM) reduction postoperatively.

Results

Of the 848 studies initially identified, 15 studies with a pooled total of 367 eyes which underwent combined phacoemulsification and angle-based MIGS were included for final meta-analysis. Outcomes of the iStent were reported in 5 studies, iStent Inject in 7 studies, Hydrus Microstent in 1 study, Kahook Dual Blade in 3 studies, and

Trabectome in 2 studies. There was significant reduction in both IOP and AGM postoperatively at 6 months (2.44 mmHg, 95% CI: 1.83–3.06; 1.21 AGM, 95% CI: 0.99–1.44), 12 months (2.28 mmHg, 95% CI: 1.71–2.84; 1.18 AGM, 95% CI: 0.90–1.47), 24 months (2.10 mmHg, 95% CI: 1.51–2.68; 1.26 AGM, 95% CI: 0.85–1.68), and 36 months (2.43 mmHg, 95% CI: 1.71–3.15, 0.87 AGM, 95% CI: 0.21–1.53) (all $p < 0.05$). Subgroup analysis on combined phacoemulsification-iStent Inject surgery demonstrated a reduction in both IOP (2.31 mmHg, 95% CI: 1.07–3.56, $p < 0.001$) and AGM (1.07 AGM, 95% CI: 0.86–1.29, $p < 0.001$) 12 months postoperatively.

Conclusion

Angle-based MIGS in combination with phacoemulsification is efficacious in reducing both IOP and AGM for NTG eyes up to 36 months after surgery.

Tables, Figures, and Illustrations

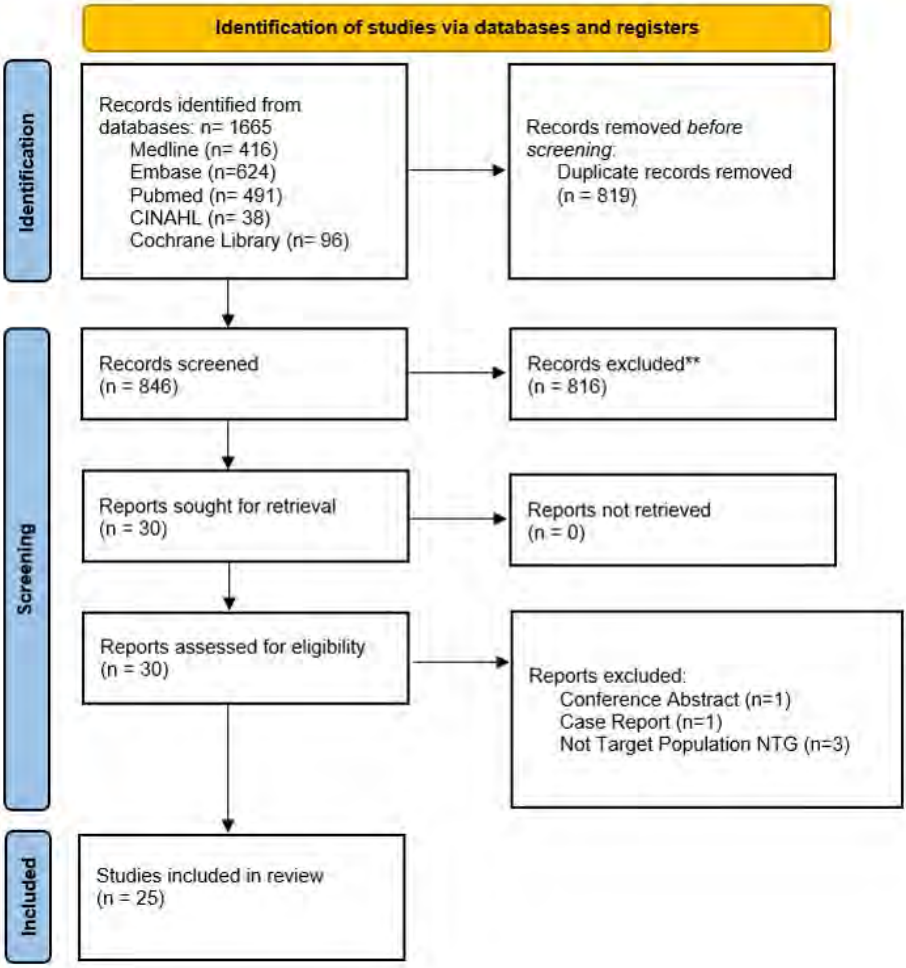
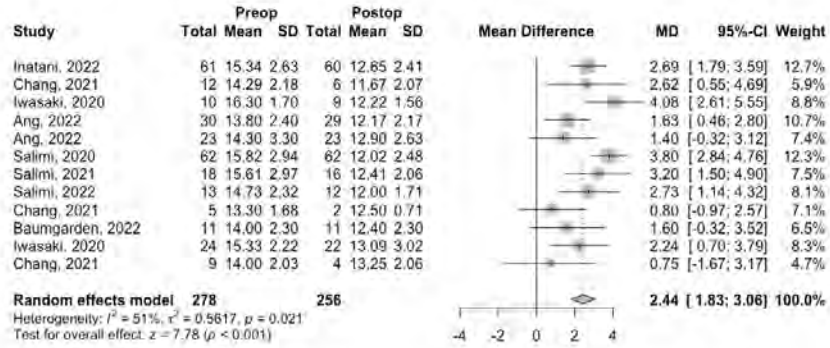
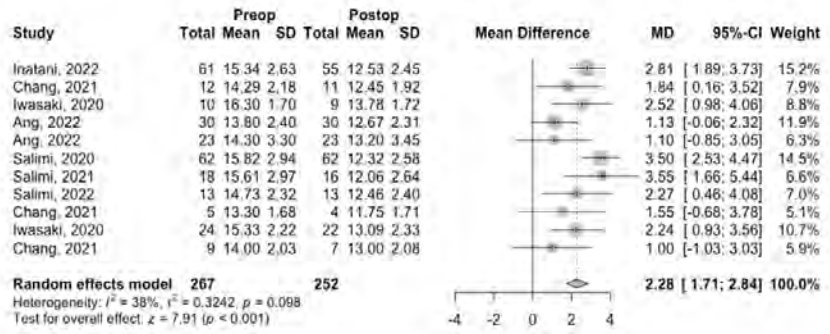


Figure 1. PRISMA flow diagram.

Post-operative Month 6



Post-operative Month 12



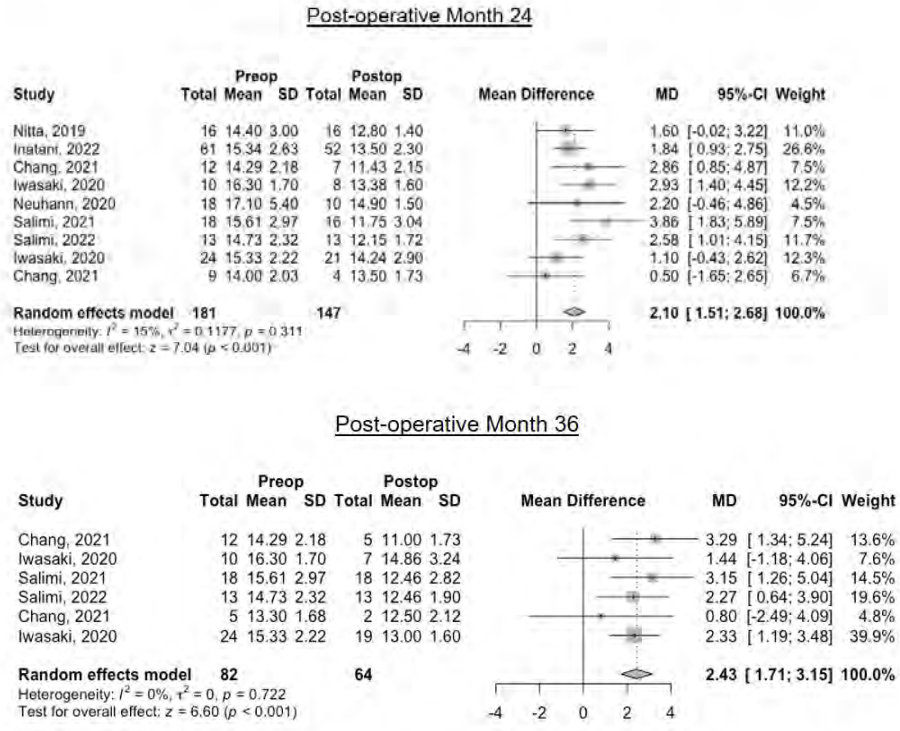
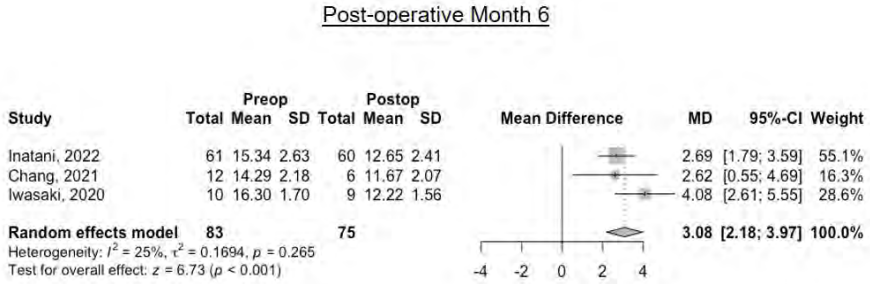


Figure 2. Pooled mean IOP at various postoperative time points.



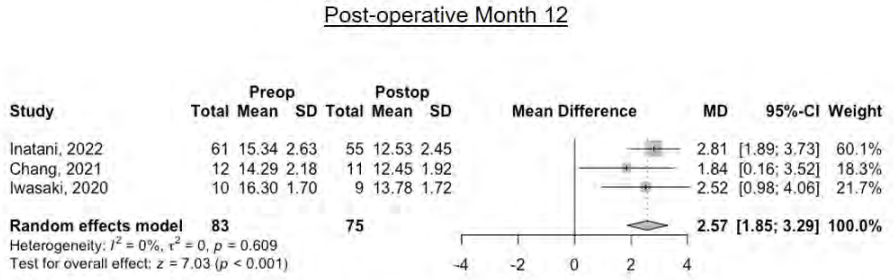


Figure 3a. Mean IOP for iStent at various postoperative time points.

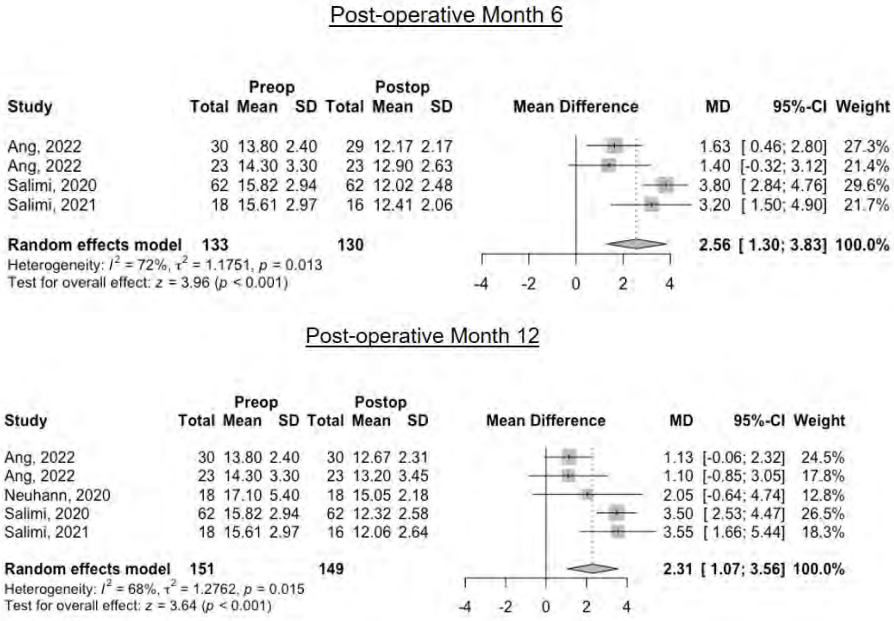
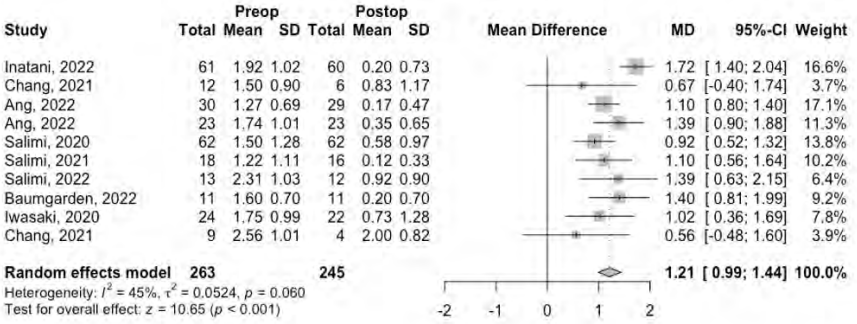
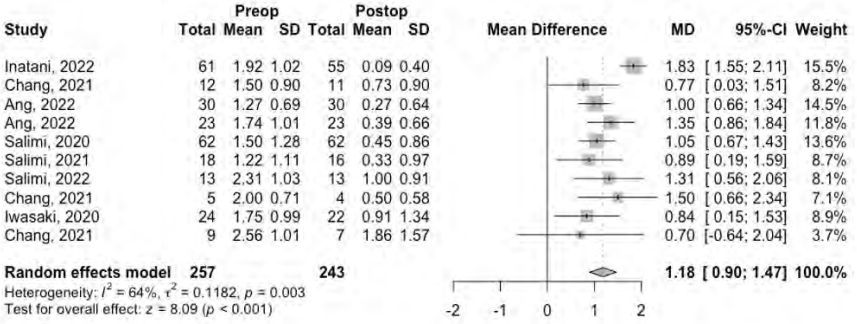


Figure 3b. Mean IOP for iStent Inject at various postoperative time points.

Post-operative Month 6



Post-operative Month 12



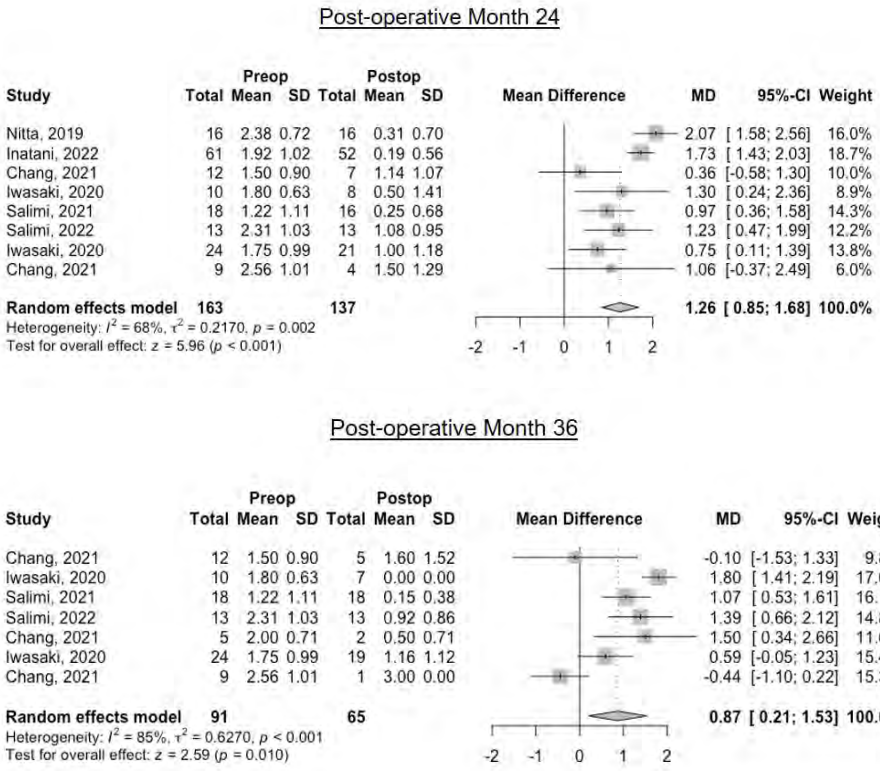
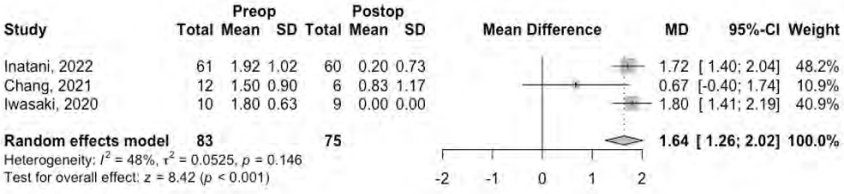


Figure 4. Pooled mean number of AGM at various postoperative time points.



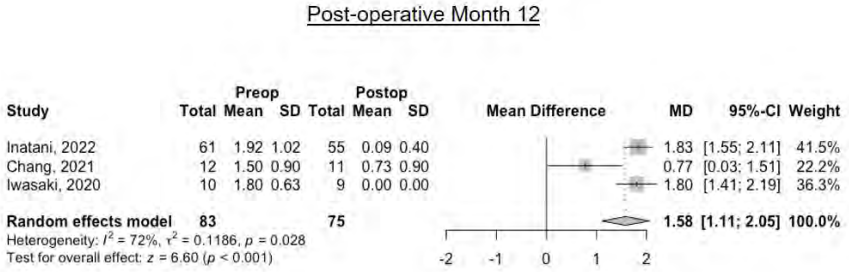


Figure 5a. Mean number of AGM for iStent at various postoperative time points.

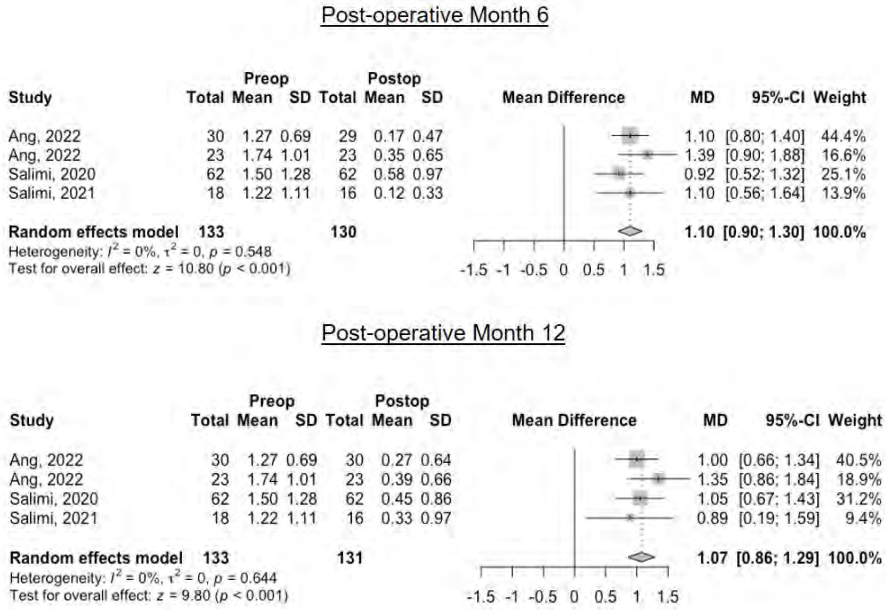


Figure 5b. Mean number of AGM for iStent inject at various postoperative time points.

SURGICAL OUTCOMES OF XEN45 IMPLANTATION, TRABECULECTOMY, AND PENETRATING CANALOPLASTY IN OPEN-ANGLE GLAUCOMA: A NONRANDOMISED COMPARATIVE STUDY

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Introduction

To compare the surgical success and the postoperative complications among XEN45 implantation, trabeculectomy with mitomycin C, and penetrating canaloplasty.

Methods

Patients with open-angle glaucoma who underwent successful XEN45 implantation, trabeculectomy, or penetrating canaloplasty by a single experienced glaucoma surgeon were evaluated. The primary outcome measures were success rate at 12 months and postoperative complications. Surgical success was defined as IOP ≤ 21 mmHg and ≥ 5 mmHg without (complete success) or with/without (qualified success) glaucoma medications.

Results

A total of 78 patients (101 eyes; 32 XEN45, 33 trabeculectomy and 36 penetrating canaloplasty) were included. After a 12-month follow-up, complete success and qualified success were 65.8% and 74.5% in the XEN45 group, 75.7% and 87.9% in the trabeculectomy group, and 75.0% and 88.9% in the penetrating canaloplasty group, respectively (Fig. 1). At 12 months after surgery, the mean IOP after XEN45 implantation was 14.3 ±3.9 mmHg, trabeculectomy was 15.0 ± 3.1 mmHg, and penetrating canaloplasty was 14.9 ± 3.8 mmHg. Transient IOP elevation was the most common complications in the penetrating canaloplasty (50.0%). The most common complication in the XEN45 group was shallow anterior chamber (25.0%). Postoperative interventions, especially bleb management, were required in 59.4%

of eyes in the XEN45 group and 63.6% of eyes in the trabeculectomy group. No eye in the penetrating canaloplasty group needed interventions.

Conclusion

All 3 surgical procedures effectively reduced IOP after 12 months. Trabeculectomy and penetrating canaloplasty showed comparable complete and qualified success, and penetrating canaloplasty did not need postoperative intervention.

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Figures

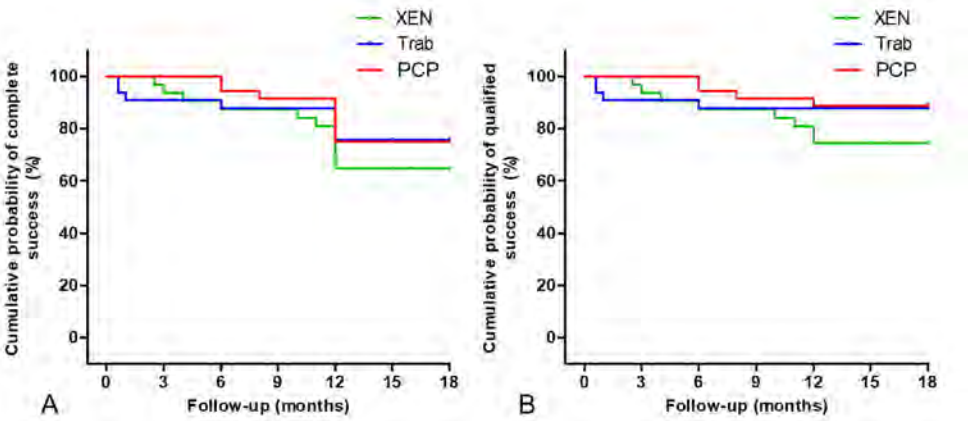

Figure 1. Kaplan–Meier curve for the (a) complete success and (b) qualified success of follow-up. Trab = trabeculectomy, PCP = penetrating canaloplasty.

EFFICACY AND SAFETY OF PAUL GLAUCOMA IMPLANT (PGI) IN THE TREATMENT OF DIFFERENT TYPES OF GLAUCOMA IN CHINA: A REAL-WORLD STUDY

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Introduction

To explore the initial clinical observations of the PAUL Glaucoma Implant (PGI) in the treatment of different types of glaucoma.

Methods

Using real-world research methods, 31 patients with different types of glaucoma who underwent PGI treatment from May 2022 to January 2023 were included in this study. The main indicators were postoperative intraocular pressure (IOP), visual acuity, postoperative complications, and the number of IOP-lowering agents.

Results

There were 31 cases/31 eyes, including 14 males and 17 females, average age: 28-69 years (51 ± 11.2 years). Glaucoma classification: 9 cases of primary open-angle glaucoma, 10 cases of primary angle-closure glaucoma, 7 cases of neovascular glaucoma, and 5 cases of secondary glaucoma. Twenty-six patients had undergone at least 1 glaucoma surgery and 11 patients had undergone 2 or more glaucoma surgeries. The IOP before the surgery was 38.83 ± 7.25 mmHg, the average use of IOP-lowering agents was 3.0 ± 1.2 drugs. IOP after PGI implantation was 15.41 ±8 .77 mmHg at 1 month, 14.19 ± 6.82 mmHg at 3 months, 16.30 ±7 .86 mmHg at 6 months, and 17.20 ± 8.86 mmHg at 12 months. After 12 months, IOP-lowering agents decreased from 0.8 (0–3). All the differences were statistically significant ($P < 0.001$). There was no decrease in visual acuity 12 months after operation, and 9 cases improved by > 2 lines. The total number of early complications was 11/31 cases

(35.5%), 5 cases of hyphaema, 3 choroidal leakage/detachment, and 3 cases of shallow anterior chamber. The late surgical complications (> 6 months) were filtering bleb encapsulation of 2 cases (6.5%).

Conclusion

The PGI is a safe and effective glaucoma drainage implant that can be used to treat different types of mid-to-late-stage glaucoma. The long-term efficacy of the treatment in Chinese patients needs further observation.

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POLYGENIC RISK SCORES INFLUENCING PENETRANCE IN MYOCILIN GLAUCOMA PEDIGREES

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[1]University of Western Australia

Introduction

Primary open-angle glaucoma (POAG) is highly heritable, and many genes have been associated with glaucoma risk. Recently polygenic risk scores (PRS) have been developed for POAG and these have been associated with increased risk in combination with the myocilin Gln368Ter mutation using population studies. Several pedigrees with myocilin mutations have been published. We wished to determine if there was evidence for interaction of PRS with the myocilin mutations.

Methods

In the Glaucoma Inheritance Study in Tasmania, we identified pedigrees with myocilin mutations: Gln368Ter, Thr377Met, and Gly252Arg.

Results

Within all these pedigrees, we noted phenocopies (where the person with POAG lacked the main myocilin mutation) and incomplete penetrance (where members of the pedigree carrying a myocilin mutation were unaffected).

Conclusion

The likely explanation for both of these is interaction with a PRS. As PRS continue to be refined in myocilin pedigrees, these analyses will need to be combined with myocilin mutation screening to give family members a better interpretation of their POAG risk.

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A COMPARISON OF THE SHORT-TERM RESULTS OF PRESERFLO MICROSHUNT ™ VERSUS TRABECULECTOMY

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[1]Aichi Medical University, Japan, [2]Aichi Medical University Eye Centre, Japan

Purpose

The PreserFlo MicroShunt™ (PMS) is a recently introduced drainage device for filtration surgery. The purpose of this study is to compare the efficacy and invasiveness of PMS and trabeculectomy.

Methods

Medical charts of potential participants who underwent PMS or trabeculectomy from March 1, 2023 to August 31, 2023 at Aichi Medical University Hospital and Aichi Medical University Eye Centre were retrospectively reviewed. All patients with more than 3 months of postoperative follow-up were included in the study. The patients were divided into two groups: PMS or trabeculectomy (trab) group. Baseline characteristics such as the type of glaucoma and duration of the surgery were collected from the medical charts. Intraocular pressure and the number of medications before surgery, 1 day, 1 week, 1 month, and 3 months after the surgery were monitored. Postoperative interventions such as needle or incisional revisions were compared between groups.

Results

Nineteen eyes in 18 patients were categorized into the PMS group and 13 eyes in 12 patients were categorized into the trab group. There was no significant difference in preoperative IOP and preoperative ocular score. Duration of the surgery was significantly shorter in the PMS group (P=0.00382) than the trab group. IOP at 1 day after surgery (6.5 ± 2.4 mmHg in the PMS group and 12.9 ± 6.5 mmHg in the trab group, P = 0.00463) showed a statistically significant differences between the two

groups. At 1 week, 1 month, and 3 there months were no significant differences between the 2 groups.

Conclusion

There was no significant difference in short-term postoperative outcomes between PMS and trabeculectomy. However, PMS was less invasive than trabeculectomy in terms of the duration of the surgery. Further studies with a greater number of eyes and longer follow-up is necessary for clarifying the effectiveness of PMS compared to trabeculectomy.

INFLUENCE OF GLAUCOMA SURGERY ON OPTIC NERVE HEAD PERFUSION DENSITY IN OPEN-ANGLE GLAUCOMA PATIENTS ASSESSED BY THE ANGIOPLEX® OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY

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Introduction

To evaluate the changes of the perfusion density (PD) of the optic nerve head (ONH) by using optical coherence tomography angiography (OCTA) pre- and post-glaucoma surgery in open angle-glaucoma (OAG) patients.

Methods

We prospectively recruited OAG patients who underwent glaucoma surgery in Hospital Canselor Tuanku Muhriz (HCTM). PD of the ONH was measured using OCTA prior to glaucoma surgery and 1, 3, and 4 months after surgery. IOP, flux index, visual acuity (log MAR), and topical antiglaucoma medication usage were also measured.

Results

A total of 24 eyes completed all assessments. They either underwent iStent (41.7%), XEN tube (16.7%), trabeculectomy (20.8%) or glaucoma drainage device (GDD) (20.8%) surgery. Post-glaucoma surgery there was a significant reduction in the mean IOP (6.36 ± 9.67 mmHg, $p < 0.05$), mean log MAR visual acuity (0.033± 0.15, $p < 0.05$), and mean number of antiglaucoma medication (2.56 ± 1.66, $p < 0.05$). There was a negative correlation between change in IOP (Pearson $r = -0.22$, $p = 0.301$), change in number of antiglaucoma medication (Pearson $r = -0.143$, $p = 0.506$), and change in log MAR visual acuity (Pearson $r = -0.12$, $p = 0.957$) with PD after glaucoma surgery but it was not significant. There was a significant increase in the PD of ONH (0.192 ± 2.79 %, $p < 0.05$) post-subconjunctival drainage glaucoma surgery and significant decrease in the PD of ONH post angle drainage (-2.42 ± 4.90%, $p < 0.05$). Subconjunctival drainage causes larger IOP reduction (-9.21 ± 12.13 mmHg, $p < 0.05$)

compared to angle drainage glaucoma surgery (-3.40 ± 2.75 mmHg ($p < 0.05$). Both IOP reduction and PD of ONH had a weak negative correlation in both glaucoma surgeries (Pearson r = -0.169 and -0.255) but it was not significant ($p = 0.563$, $p = 0.478$).

Conclusion

OCTA revealed that the magnitude of PD increase depends on the magnitude IOP reduction outcome of the glaucoma surgery.

SECONDARY GLAUCOMA FOLLOWING PARS PLANA VITRECTOMY WITH TAMPONADE: A RETROSPECTIVE ANALYSIS

Mohan N

Background and rationale

Vitreoretinal (VR) surgery is the third most common intraocular surgery performed after cataract and refractive surgery. Increased intraocular pressure (IOP) is a common complication, with reported incidence ranging from 20% to 60%. Most of the published literature is from a few decades back and VR surgery has evolved since then.

Objective

Primary: Assess the incidence of secondary glaucoma after pars plana vitrectomy (PPV) with silicone oil (SO) or gas injection.
Secondary: Analyse risk factors for secondary glaucoma post PPV with tamponade.

Methods

Case records of 250 patients who underwent PPV between June 1, 2019 and October 31, 2019 analysed. Secondary glaucoma was defined as need for antiglaucoma medications (AGM) or IOP more than 21 mmHg persisting at postoperative day 42. IOP more than 21 mmHg for less than 6 weeks was considered a transient rise.

Results

Incidence of secondary glaucoma at postoperative day 42 was 21%, at 3 months 24% and 31.8% at 6 months. Secondary glaucoma with SO tamponade was 43.5%. (43.3% with 1000 Cs and 50% with 5000 Cs). With gas tamponade the incidence was 27.08%. (38.5% with SF6 and 13.6% with C3F8). Incidence of secondary glaucoma in combined phacoemulsification and PPV was 24% and for PPV alone was 37% ($p = 0.009$). Incidence in PPV as primary surgery was 30.5% and in re-surgery was 53.8% ($p = 0.011$). Highest Incidence was in retinal detachment surgery (55%), least with

macular hole surgery (4.1%). Five patients underwent YAG laser iridotomy for angle closure, 1 trabeculectomy, 3 diode laser cyclophotocoagulation and 2 glaucoma drainage implant.

Conclusion

Secondary glaucoma post-VR surgery is a common complication with the incidence increasing up to 6 months. Patients undergoing re-surgeries and retinal detachment surgeries are at a higher risk. Most patients were managed with topical medications, with a small proportion needing surgical intervention.

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CATARACT AFFECTS MACULAR GANGLION CELL THICKNESS GREATER THAN PERIPAPILLARY RETINAL NERVE FIBRE LAYER THICKNESS

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Introduction

The assessment of peripapillary retinal nerve fibre layer (pRNFL) and macular ganglion cell complex (mGCC) is crucial in diagnosing and managing various retinal and optic nerve diseases. Our study was undertaken to evaluate changes in pRNFL and mGCC measurements on spectral domain optical coherence tomography (SD-OCT) following cataract surgery, in patients with immature senile cataract (IMSC).

Methods

Forty-seven patients with uncomplicated IMSC underwent pre- and 1-month postoperative (phacoemulsification and intraocular lens implantation) assessment of pRNFL and mGCC using SD-OCT (Cirrus HD-OCT, Carl-Zeiss Meditec). Only images with a quality score of 6 and above were included. Pre- and postoperative pRNFL and mGCC values were compared and $P < 0.05$ considered significant.

Results

The average age of patients was 59.88 ± 8.86 years. There were 29 men and 18 women. The median preoperative quality score was 7(6, 7) and postoperatively was 8 (7,9) [P < 0.001]. Significant differences were seen in the measurements of the average and temporal pRNFL (average pRNFL: $P < 0.001$, temporal pRNFL: $P = 0.03$). Significant differences were seen on comparing all mGCC measurements pre- and postoperatively (average mGCC: $P < 0.001$, minimum mGCC: $P < 0.001$, superior mGCC: $P = 0.002$, superotemporal mGCC: $P = 0.002$, superonasal mGCC: $P = 0.002$, inferior mGCC: $P = 0.018$, inferotemporal mGCC: $P < 0.001$, inferonasal mGCC: $P = 0.006$). All mGCC measurements were significantly affected irrespective of nuclear

(n = 26) or posterior subcapsular (n = 21) subtype compared with the pRNFL values (only average pRNFL was affected).

Conclusion

Our study shows that cataract affects the measurements of mGCC more than those of pRNFL on SD-OCT (Cirrus HD-OCT, Carl-Zeiss Meditec), even when the quality score may be deemed acceptable. It is therefore necessary to carefully examine for any evolving lens changes prior to suspecting progression and resetting the baseline following cataract surgery in glaucoma patients.

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FIVE-YEAR OUTCOMES OF THE PAUL GLAUCOMA IMPLANT FOR TREATMENT OF GLAUCOMA

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Introduction

The Paul Glaucoma Implant (PGI) is a novel glaucoma tube shunt. In a previous study, the PGI had shown sustained IOP reduction with dose reduction at 2 years postoperatively. This study is to examine 5-year efficacy of the PGI.

Methods

Retrospective review of patients who had undergone PGI implantation at National University Hospital, Singapore from May 2017 to February 2019. Primary outcome measure was failure, defined as intraocular pressure (IOP) > 18 mmHg or < 6 mmHg after 3 months, reoperation, explantation of PGI, or loss of light perception. We defined complete success as the absence of failure without medications at 5 years. The mean postoperative IOP, number of medications, and visual acuity were assessed.

Results

Thirty-eight eyes of 38 patients were identified. At 5 years postoperatively, 12 cases (31.6%) fulfilled criteria for failure and 22 (57.9%) met criteria for complete success. Mean medicated IOP was reduced from 20.4 ± 6.3 mmHg preoperatively to 14.4 ± 3.8 mmHg at 5 years ($p < 0.001$). Mean number of medications at 5 years was 0.7 ± 1.2, from mean preoperative of 3.1 ± 1.0 ($p < 0.001$).

Conclusion

The PGI had shown sustained IOP reduction and reduced number of medications through 5 years post-operatively.

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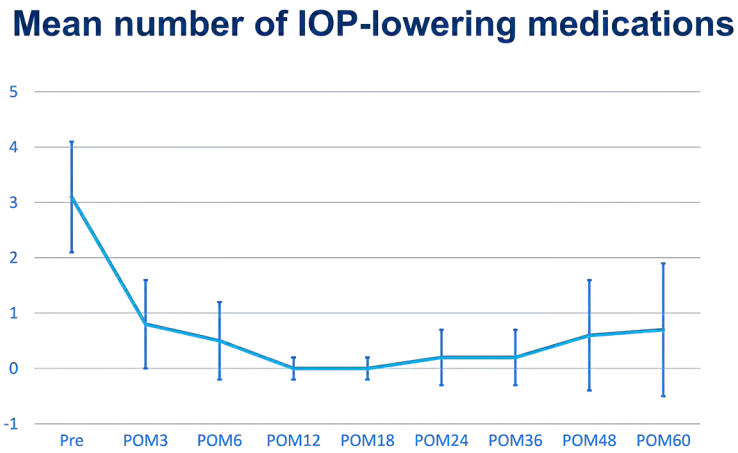
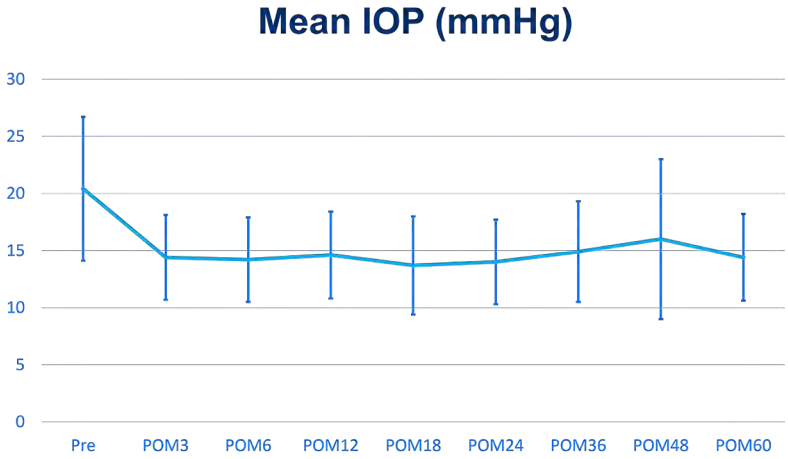
Figures


Mean number of IOP-lowering medications
5
4
3
2
1
0
-1
Pre
POM3
POM6
POM12
POM18
POM24
POM36
POM48
POM60


Mean IOP (mmHg)
30
25
20
15
10
5
0
Pre
POM3
POM6
POM12
POM18
POM24
POM36
POM48
POM60

THE SHORT-TERM SAFETY AND EFFICACY OF XEN GEL STENT IMPLANTATION AB EXTERNO WITH OPEN CONJUNCTIVAL APPROACH COMBINED WITH THE SURROUNDING SUTURE

Park H

Introduction

It has been reported that XEN Gel Stent placement ab externo with open conjunctival approach provides lower intraocular pressure (IOP) than ab interno approach. But there are possible postoperative complications such as shallow anterior chamber, corneoiridial synechiae, and hypotony. For this reason, this novel procedure is devised that the surrounding suture to sclera is additionally placed around the inserted XEN Gel Stent combined with XEN Stent placement. The safety and efficacy of this new method is evaluated with compared to the standalone XEN Gel Stent Implantation ab externo with open conjunctival approach.

Methods

A retrospective chart review of eyes that received XEN Gel Stent placement only ab exteno (AE group) or ab externo combined with the surrounding suture (C group) from October to December 2023 was conducted. A single surgeon performed all operations and all ab externo XEN Gel Stent placements were designed as ab externo with open conjunctival approach. The acuity (VA), spherical equivalent (SE), IOP, corneal endothelial cell density (CD), and anterior chamber depth (ACD) were measured preoperatively and postoperatively in each 2 groups.

Results

Eight eyes in AE group and 7 eyes in C group were studied. There were no baseline demographic data differences between the 2 groups ($p > 0.05$). VA, SE, and ACD changes were more significant in the AE group than in the C group at 1 month after surgery, but not different postoperatively at 2 months. IOP was more significantly reduced after surgery than before surgery in both groups. The amount of IOP

reduction after surgery was significantly more in AE group than C group ($p = 0.203$), but not different at 2 months ($p = 0.034$).

Conclusion

This novel procedure is simple and effective for reducing the occurrence of postoperative complications and the control of IOP in the early period after XEN Gel Stent implantation.

CHARACTERISTIC OF OCT ABNORMALITIES IN THE RNFL THICKNESS DEVIATION MAP ENABLES DIFFERENTIATION BETWEEN FALSE-POSITIVE AND GLAUCOMA IN MYOPIC EYES

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Background and rationale

In myopia, the usefulness of the OCT deviation map is limited due to a high frequency of false-positive results in healthy eyes, yielding a poor specificity. The aims of the present study were: (1) To describe the pattern of OCT abnormalities in the peripapillary retinal nerve fibre layer (RNFL) deviation map in healthy myopic eyes and (2) to compare the location of the abnormalities between healthy and glaucomatous myopic eyes.

Methods

Peripapillary RNFL thickness was assessed with Cirrus OCT in 137 myopic eyes (median spherical equivalent -4.9 D) of 137 healthy subjects and 42 eyes (-4.6 D) of 42 glaucoma patients (Group 1), and with Topcon OCT-2000 in 116 myopic eyes (-3.0 D) of 116 healthy subjects and 74 eyes (-2.0 D) of 74 patients (Group 2). We recorded (1) the area of the color-coded region in the RNFL thickness deviation map and (2) the location of the color-coded region relative to the major temporal retinal vessels. We calculated the sensitivity and specificity with a positive test defined as (1) presence of a color-coded region that qualified as abnormal and (2) presence of a color-coded region that qualified as abnormal and was located at least partially on the temporal side of the major temporal vessels.

Results

By taking the location into account, the specificity increased from 22.6% to 95.8% in Group 1 ($P < 0.001$) and from 62.1% to 94.0% in Group 2 ($P < 0.001$). Corresponding sensitivities were 96.2% and 95% (Group 1) and 94.6% and 91.9% (Group 2).

Conclusions

The location of the color-coded region in the RNFL thickness deviation map relative to the major temporal retinal vessels offers a simple and valuable clue for differentiating between false-positive and glaucoma in myopic eyes.

PREDICTORS OF ANTERIOR CHAMBER ANGLE STATUS AT THE TIME OF NEOVASCULAR GLAUCOMA DIAGNOSIS

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Introduction

Since treatment for neovascular glaucoma (NVG) may differ depending on angle status, we sought to perform a retrospective cross-sectional study to identify clinical features which may predict the baseline angle morphology at the time of NVG diagnosis. Additionally, we sought to describe the subgroup of eyes that did not have gonioscopy documented at the time of NVG diagnosis to better elucidate why some eyes did not undergo this critical part of the eye exam.

Methods

Chart review was performed for all NVG eyes from 2010 to 2022. Complete angle closure was defined as having > 75% PAS, partial angle closure as having 1–75% PAS, and open angles as having 0% PAS.

Results

Among 190 eyes with a diagnosis of NVG, 29 eyes had a prior NVG diagnosis and 32 eyes did not undergo gonioscopy; 129 eyes (mean 65.5 years, 50% women) had a gonioscopy documented at the time of diagnosis. There were 32 eyes with open angles, 39 eyes with partially closed angles, and 58 eyes with completely closed angles. Mean BCVAs were 20/138 (logMar 0.84, CI = 0.78–0.90), 20/662 (logMar 1.52, CI = 1.41–1.62), and 20/4375 (logMar 2.34, CI = 2.17–2.51), respectively ($p < 0.05$). The mean presenting IOP was 31 mmHg, 40 mmHg, and 59 mmHg, and the proportion of eyes that were phakic were 47%, 46%, and 67%, respectively. The proportion of eyes presenting to the emergency department and belonging to new patients were 6% and 4%, 21% and 46%, and 26% and 55%, respectively.

Conclusion

Among NVG eyes with a documented initial gonioscopy, nearly half had total synechial closure. While eyes with increasing degrees of angle closure trended towards worse vision and higher IOP, these clinical characteristics are not perfectly predictive of angle anatomy and should not replace gonioscopy. Eyes with closed angles tended towards being phakic, presenting to the ED, and belonging to unestablished patients.

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Figures

Table 1. Clinical characteristics of NVG eyes with varying anterior chamber angle status at time of initial diagnosis.

PDR = proliferative diabetic retinopathy; RVO = retinal vein occlusion; RD = retinal detachment; RAO = retinal artery occlusion; OIS = ocular ischemic syndrome; BCVA = best corrected visual acuity; CF = count fingers; HM = hand motion; LP = light perception; NLP = no light perception; IOP = intraocular pressure; PRP = panretinal photocoagulation; PPV = pars plana vitrectomy

* = $p < 0.05$

Note: N = number of eyes; there were 129 eyes from 115 patients with a documented gonioscopy and 32 eyes from 31 patients without a gonioscopy

	OPEN ANGLE (N=32, 24.8%)	PARTIALLY CLOSED (N=39, 30.2%)	COMPLETELY CLOSED (N=58, 45.0%)	NO GONIOSCOPY AVAILABLE (N=32)
MEAN AGE (yrs)	67.5 (SD 10.9)	67.4 (SD 15.2)	63.1 (SD 14.8)	66.6 (SD 15.0)
GENDER				
Male	15 (46.9%)	20 (51.3%)	30 (51.7%)	19 (61.3%)
Female	17 (53.1%)	19 (48.7%)	28 (48.3%)	13 (38.7%)
RACE				
Black	17 (53.1%)	28 (71.8%)	40 (69.0%)	20 (62.5%)
White	15 (46.9%)	10 (25.6%)	16 (27.6%)	12 (37.5%)
Other	0 (0%)	1 (2.6%)	2 (3.4%)	0 (0%)
ETIOLOGY				
PDR	19 (59.4%)	20 (51.3%)	29 (50.0%)	26 (81.3%)
RVO	7 (21.9%)	13 (33.3%)	18 (31.0%)	6 (18.7%)
RD	1 (3.1%)	3 (7.7%)	5 (8.6%)	0 (0%)
RAO	1 (3.1%)	1 (2.6%)	6 (10.3%)	0 (0%)
OIS	1 (3.1%)	2 (5.1%)	0 (0%)	0 (0%)
Radiation Retinopathy	1 (3.1%)	0 (0%)	0 (0%)	0 (0%)
Idiopathic	2 (6.3%)	0 (0%)	0 (0%)	0 (0%)
BCVA				
MEAN LOGMAR	0.84*	1.52*	2.34*	1.92
20/20-20/40	14 (43.8%)	8 (20.5%)	0 (0%)	4 (12.5%)
20/50-20/200	8 (25.0%)	7 (17.9%)	5 (8.6%)	4 (12.5%)
20/250-20/1250	4 (12.5%)	5 (12.8%)	2 (3.4%)	2 (6.3%)
CF-HM	5 (15.6%)	10 (25.6%)	26 (44.8%)	10 (31.3%)
LP	1 (3.1%)	8 (20.5%)	15 (25.9%)	5 (15.6%)
NLP	0 (0%)	1 (2.6%)	10 (17.2%)	7 (21.9%)
MEAN IOP (mmHg)	31.0 (SD 11.0)	40.3 (SD 12.9)	44.8 (SD 11.9)	39.7 (SD 11.6)
MEAN # OF IOP-LOWERING MEDS	0.9 (SD 1.4)	1.3 (SD 1.7)	0.9 (SD 1.5)	0.4 (SD 1.3)
NEW PATIENT				
YES	13 (40.6%)	18 (46.2%)	32 (55.2%)	14 (43.8%)
NO	19 (59.4%)	21 (53.8%)	26 (44.8%)	18 (56.2%)
SETTING				
Emergency Department	2 (6.3%)	8 (20.5%)	15 (25.9%)	5 (15.6%)
Clinic	30 (93.8%)	31 (79.5%)	43 (74.1%)	27 (84.4%)
SYMPTOMATIC				
YES	16 (50.0%)	32 (82.1%)	56 (96.6%)	28 (87.5%)
NO	16 (50.0%)	7 (17.9%)	2 (3.4%)	4 (12.5%)
MICROCYSTIC EDEMA				
YES	5 (15.6%)	13 (33.3%)	30 (51.7%)	8 (25.0%)
NO	27 (84.4%)	26 (66.7%)	28 (48.3%)	24 (75.0%)
HYPHEMA				
YES	3 (9.4%)	7 (17.9%)	10 (17.2%)	6 (18.7%)
NO	29 (90.6%)	32 (82.1%)	48 (82.8%)	26 (81.3%)
LENS STATUS				
Phakic	15 (46.9%)	18 (46.2%)	39 (67.2%)	15 (46.9%)
Pseudophakic	16 (50.0%)	21 (53.8%)	18 (31.0%)	17 (53.1%)
Aphakic	1 (3.1%)	0 (0%)	1 (1.7%)	0 (0%)
VITREOUS HEMORRHAGE				
YES	7 (21.9%)	4 (10.3%)	21 (36.2%)	4 (12.5%)
NO	25 (78.1%)	35 (89.7%)	37 (63.8%)	28 (87.5%)
PRIOR PRP				
YES	4 (12.5%)	11 (28.2%)	24 (41.4%)	8 (25.0%)
NO	28 (87.5%)	28 (71.8%)	34 (58.6%)	24 (75.0%)
PRIOR PPV				
YES	4 (12.5%)	6 (15.4%)	12 (20.7%)	3 (9.4%)
NO	28 (87.5%)	33 (84.6%)	46 (79.3%)	19 (90.6%)

INITIAL EXPERIENCE AND EARLY COMPLICATIONS OF PRESERFLO MICROSHUNT IN THE MANAGEMENT OF ADVANCED GLAUCOMA

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Introduction

To evaluate the safety and efficacy of the Preserflo Microshunt alone or in combination with cataract surgery.

Methods

This is a single surgeon cohort study of all consecutive patients who received the PreserFlo Microshunt in 3 tertiary referral centres in Malaysia. Eligible patients were aged over 18 years with a diagnosis of advanced glaucoma (MD < -12 dB), inadequately controlled on maximal tolerated medical therapy, and receiving the PreserFlo MicroShunt with intraoperative MMC 0.4 mg/mL. Intraoperative, early (< 3 months), and late (> 3 months) postoperative complications as well as postoperative interventions, including bleb injections and needling, revisions, and reoperations were collected. Primary outcome at 6 months was complete success (IOP < 18 mmHg, without antiglaucoma medications), qualified success (IOP < 18 with antiglaucoma medications), with failure defined as IOP > 18 mmHg, IOP ≤ 5 mmHg with any decreased vision on 2 consecutive visits, reoperation, or loss of light perception vision.

Results

Thirty eyes of 28 patients are included. Complete and qualified success at six months were achieved in 86.6% (N = 26) and 6.7% (N = 2), respectively, and failure occurred in 6.7% (N=2). There was a significant reduction in IOP (mmHg) from preoperatively (27.4 ± 1.2, to 6 months (13.5 ± 0.8) ($p < 0.0001$). Antiglaucoma medications also decreased from preoperatively (3.7 ± 0.3) to 12 months (0.6 ± 0.3) ($p < 0.0001$). Complications were tube blockage (3.3%, n = 1), aqueous misdirection

(3.3%, n = 1), transient hypotony (20%, n = 6) and transient hyphaema (10%; N = 3). Needling and 5-fluorouracil injections were performed in (13.3%, n = 4) and 6.7%, n = 2) required revision surgery.

Conclusion

The PreserFlo MicroShunt with MMC 0.4 mg/mL showed an overall success rate of 93.3% at 6 months with significant IOP and medication reduction with a low rate of complications.

THE DUEL OF THE BEHEMOTHS OF EXCISIONAL GONIECTOMY: COMPARING THE EARLY OUTCOMES OF KAHOOK DUAL BLADE VS. BENT AB INTERNO NEEDLE GONIECTOMY

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Introduction

Excisional goniectomy represents a pivotal component of the evolving landscape of minimally invasive glaucoma surgeries. This study aims to compare the early postoperative efficacy of two prominent excisional goniectomy procedures: Kahook Dual Blade (KDB) (New World Medical, United States) and bent ab interno needle goniectomy (BANG).

Methods

The study enrolled 50 eyes, with 25 eyes in each arm allocated to either the KDB or BANG group. Inclusion criteria encompassed patients with mild to moderate open-angle glaucoma, excluding secondary and angle-closure glaucoma cases. Preoperative and postoperative intraocular pressure (IOP) and the number of antiglaucoma medications (AGMs) were recorded at 1 week, 1 month, 3 months, and 6 months. The primary objectives centred on analysing the reduction in these parameters, while the secondary objective aimed to quantify the success of each procedure in terms of complete (IOP > 5 and ≤ 20 mmHg without medication) and qualified success (IOP > 5 and ≤ 20 mmHg with medication).

Results

Preoperative baseline IOP was 22.28 ± 3.34 mmHg in the BANG group and 25.83 ± 3.67 mmHg in the KDB group. The mean reduction in IOP was 3.21 ± 0.62 mmHg and 2.05 ± 1.11 mmHg in the BANG and KDB groups, respectively. The reduction in the number of AGMs was 0.79 ± 0.10 and 1.00 ± 0.33 in the BANG and KDB groups, respectively. At 1 month postoperatively, the BANG group achieved a commendable

complete success rate of 86%, while the KDB group demonstrated an impressive 100% complete success rate.

Conclusion

While both procedures exhibited comparable outcomes regarding reductions in IOP and the number of AGMs, KDB showcased fool-proof efficacy with a remarkable 100% complete success rate. This study contributes valuable insights into the ongoing dialogue surrounding the choice KDB and BANG in the realm of excisional goniectomy.

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CORRELATION BETWEEN PERIPAPILLARY PERFUSION DENSITIES AND RETINAL NERVE FIBRE LAYER THICKNESS IN PRIMARY OPEN-ANGLE GLAUCOMA IN INDONESIA

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Introduction

Retinal nerve fibre layer thickness (RNFL) is a structure that affected in glaucoma. Ocular perfusion is factor that can influence manifestation and progressivity of primary open-angle glaucoma (POAG). The aim of the study was to compare the peripapillary perfusion densities between POAG and healthy eyes and corelation between peripapillary perfusion and RNFL thickness in POAG.

Methods

This was a cross-sectional observational study conducted in 53 eyes from 33 POAG patients and 56 eyes from 31 healthy subjects. Peripapillary perfusion density was measured using optical coherence tomography angiography (OCTA) and RNFL thickness was measured using Cirrus optical coherence tomography (OCT).

Results

Peripapillary perfusion density was significantly lower in POAG 43.04 ± 3.769 compared to healthy eyes 45.33 ± 1.547 ($p = 0.006$). Peripapillary flux index was significantly lower in POAG 0.38 ± 0.061 compared to healthy eyes 0.45 ± 0.030 ($p = 0.0001$). The correlation between peripapillary perfusion and RNFL showed significantly moderate correlation $r = 0.536$ ($p = 0.0001$) and correlation between peripapillary flux index and RNFL also showed significantly strong correlation $r = 0.690$ ($p = 0.0001$)

Conclusion

Decreased peripapillary perfusion was found in POAG patients and it correlates with structural changes of RNFL. This finding suggests that peripapillary perfusion changes seem to play a role in the thinning of RNFL in POAG.

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ONE-YEAR OUTCOMES OF BENT ANGLE NEEDLE GONIECTOMY WITH PHACOEMULSIFICATION IN PATIENTS ACROSS THE GLAUCOMA SPECTRUM

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Purpose

To study 1-year outcomes of bent angle needle goniectomy (BANG) with phacoemulsification in patients across the glaucoma spectrum.

Design

Prospective cohort study.

Participants

Adult glaucoma patients of any stage with medically controlled intraocular pressure (IOP) and visually significant cataracts. Patients completing a minimum 1-year post-surgical follow-up were analysed.

Intervention

Clear corneal phacoemulsification with intraocular lens placement was combined with BANG using a 25-gauge needle bent as a reverse cystitome.

Main Outcome Measures

The primary outcome was the change in antiglaucoma medications (AGM) required after surgery. Secondary outcomes were IOP control and complications. Qualified and complete success, respectively, were defined as IOP 6–21 mmHg with and without 3 topical medications.

Results

Thirty eyes of 30 patients were analysed. Fourteen eyes had primary open-angle glaucoma (POAG), 11 had primary angle-closure disease (PACD), 3 had

pseudoexfoliation glaucoma, and 2 had normal-tension glaucoma (NTG), respectively. The mean baseline IOP was 15.3 ± 3.6mmHg, and the mean number of topical AGMs was 2.6 ± 1.3. Ten patients were on systemic acetazolamide.
Topical AGM requirement decreased to 0.60 ± 0.99 ($p < 0.0001$) and 0.87 ± 1.02 ($p < 0.0001$) at 6 months and 1 year, respectively. No patient required oral acetazolamide after surgery. The mean IOP decreased to 13.57 ± 2.79 ($p = 0.028$) and 14.43 ± 2.92 mmHg ($p = 0.11$) at 6 months and 1 year, respectively. At 1 year, complete and qualified success was seen in 14 eyes each (93.4%). One eye required additional glaucoma surgery, and one required a fourth topical AGM. Six eyes (20%) had an episode of a transient IOP spike, which resolved in 2 weeks, and 1 eye had hyphaema, which resolved by the fourth day. There were no serious complications.

Conclusions

Phacoemulsification with BANG is an effective and safe procedure for reducing the medication burden in patients across the glaucoma spectrum.

PHACOGONIOTOMY VERSUS PHACOTRABECULECTOMY FOR ADVANCED PRIMARY ANGLE-CLOSURE GLAUCOMA WITH CATARACT: A RANDOMISED NON-INFERIORITY TRIAL

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Introduction

To investigate the effectiveness and safety of phacogoniotomy versus phacotrabeculectomy (PVP) among patients with advanced primary angle-closure glaucoma (PACG) and cataract.

Methods

Multicentre, randomised controlled, non-inferiority trial. A total of 124 patients (124 eyes) with advanced PACG and cataract were enrolled, with 65 in the phacogoniotomy group and 59 in the phacotrabeculectomy group. Patients were followed up for 12 months with standardized evaluations. The primary outcome was the reduction in intraocular pressure (IOP) from baseline to 12 months postoperatively, of which a non-inferiority margin of 4 mmHg was evaluated. Secondary outcomes included the cumulative surgical success rate, postoperative complications, and changes in the number of glaucoma medications.

Results

After 12 months, phacogoniotomy demonstrated non-inferiority to phacotrabeculectomy in terms of IOP reduction, with mean IOP reductions of -26.1 mmHg and -25.7 mmHg (P = 0.383), respectively, from baseline values of around 40 mmHg. Both groups experienced a significant reduction in the mean number of medications used postoperatively (P < 0.001). The cumulative success rate was comparable between the groups (P = 0.890). However, phacogoniotomy had a lower rate of postoperative complications and interventions (12.3% and 4.6%, respectively) compared to phacotrabeculectomy (23.7% and 20.3%, respectively). The phacogoniotomy group reported shorter surgery time (22.1 ± 6.5 vs. 38.8 ± 11.1 minutes; P = 0.030) and higher quality of life (EQ-5D-5L) improvement at 12 months (7.0 ± 11.5 vs. 3.0 ± 12.9, P = 0.010) than the phacotrabeculectomy group.

Conclusion

Phacogoniotomy was non-inferior to phacotrabeculectomy in terms of IOP reduction for advanced PACG and cataract. Additionally, phacogoniotomy provided a shorter surgical time, lower postoperative complication rate, fewer postoperative interventions, and better postoperative quality of life.

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ASSESSING OCULAR RISK FACTORS IN PRIMARY ANGLE-CLOSURE DISEASE PROGRESSION: THE ASYMPTOMATIC NARROW ANGLES LASER IRIDOTOMY STUDY

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Purpose

To evaluate baseline ocular risk factors associated with primary angle-closure glaucoma suspect (PACS) progression to primary angle closure (PAC) or acute angle closure (AAC).

Methods

Participants underwent comprehensive ocular examinations including anterior segment imaging (Visante, Carl Zeiss Meditec, Dublin) and ultrasound biomicroscopy for plateau iris quadrant (PIQ) assessment before laser iridotomy (LPI). PACS was diagnosed if pigmented trabecular meshwork was not visualised for 2 or more quadrants on non-indentation gonioscopy. Progression over 5 years was defined as the development of PAC (defined by elevated intraocular pressure [IOP] >24 mmHg or peripheral anterior synechiae) or an AAC attack.

Results

The mean age of subjects was 62.85 ± 7.18 years, with a majority being female (76.4%). Among 322 eyes, 16 (4.97%, 7 with LPI and 9 without LPI) showed progressors. Univariable logistic regressions demonstrated there were significant correlations between progression and IOP (odd ratio [OR] = 1.38 per 1 mmHg increase, P = 0.009), post-dilation IOP (OR = 1.33 per 1 mmHg increase, P = 0.004), lens vault (LV; OR = 1 per 1 mm increase, P = 0.016), angle opening distance (AOD500; OR = 2.63 per 10 mm decrease, P = 0.014), trabecular iris space area (TISA500; OR = 8.33 per 10 mm^2 decrease, P =0 .005) and PIQ (OR = 12.75 per quadrant increase, P <

0.001). In a multivariable model, IOP (OR = 1.6, P = 0.025), AOD500 (OR = 3.45, P = 0.022) and PI (OR = 13.48, P < 0.001) were significantly associated with progression (area under curve = 0.91).

Conclusions

At baseline visit before LPI, narrower anterior chamber angles, increased quadrants of plateau iris, and higher IOP serve as key ocular risk factors for stratifying the risk of progression from PACS to severe disease.

AUTOMATED MACHINE LEARNING MODEL FOR THE MULTI-CLASS CLASSIFICATION OF PATHOLOGICAL MYOPIA AND GLAUCOMA ON COLOUR FUNDUS PHOTOGRAPHS

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Introduction

Being the leading causes of visual impairment worldwide, artificial-intelligence (AI)-assisted screening for myopia and glaucoma is potentially beneficial to lowering the disease burden and improving prognosis.[1] In the past, traditional deep learning models have struggled with differentiating between glaucomatous and myopic eye images, causing notable false positives or negatives when performing classification with the 2 classes.[2,3] In this paper, we have created and validated an automated machine learning (AutoML) model to investigate its discriminative power when screening for pathological myopia (PM) and glaucoma on colour fundus photographs (CFP)s.

Methods

A Vertex AI AutoML (Google) model was constructed based on 2,834 CFPs retrieved from the Ocular Disease Intelligent Recognition (ODIR) dataset. Poor quality images (e.g. blurred or cropped images) were removed, and image re-annotation was not performed. The CFPs were labelled based on the standardised evaluation of Chinese ophthalmology experts with quality control in place. CFPs were split into 8-1-1 for training, validation, and testing of the model. External validation of the model was performed using 90 CFPs retrieved from the Pathologic Myopia challenge (PALM) dataset and Standardised Fundus Glaucoma dataset (SMDG).

Results

The AutoML model showcased excellent discriminating performance in PM and glaucoma detections. At the 0.5 confidence threshold cut-off, the model has an overall accuracy of 90.74%, precision of 90.7%, and recall of 90.7%. The per-class accuracy and specificity for PM is 98.79% and 99.13% respectively, and 91.76% and 97.11% respectively for glaucoma. Upon external validation, the AutoML model performed at an overall accuracy of 77.78%. The per-class accuracy and specificity for PM are 80.46% and 100% respectively, and 95.89% and 100% respectively for glaucoma.

Conclusion

With high per-class accuracies and specificities for PM and glaucoma, our AutoML model can accurately distinguish between PM and glaucoma on CFPs in screenings.

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EARLY DETECTION OF POTENTIAL NON-RESPONDERS TO SELECTIVE LASER TRABECULOPLASTY IN OPEN-ANGLE GLAUCOMA

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Introduction

Selective laser trabeculoplasty (SLT), which is gradually recognized as the first choice in the treatment of open-angle glaucoma (OAG), fails to relieve the conditions in certain non-responders. To detect potential non-responders to SLT earlier, we posed a more sensible standard and applied interpretable machine learning with high-quality data from a large prospective trial.

Methods

We included 170 eyes from 98 newly diagnosed OAG patients who underwent repeat SLT and 3-year follow-ups in the Laser-1st Arm of the LiGHT China trial. A silver standard defined that maximum intraocular pressure (IOP) reduction < 20% after both initial SLT and repeat SLT indicated poor responsiveness. Logistic regression, support vector machine, and random forest models were developed to detect the potential non-responders and cross-validation was taken for evaluation. Because of severe imbalanced group size, f1 score rather than area under the receiver operating characteristic curves (AUROC) was primarily assessed.

Results

Potential non-responders to SLT had older age ($P = 0.01$), a higher proportion of females ($P = 0.03$), and lower IOP ($P < 0.001$) compared to the responders. On average, they achieved much more IOP reduction from subsequent topical medication than SLT ($P < 0.001$). Machine-learning models trained on merely baseline characteristics achieved at least equivalent f1 scores to the routine ($P = 0.44$ for logistic regression, $P = 0.11$ for support vector machine, and $P = 0.24$ for random forest) in cross-validation. Adding the maximum intraocular pressure reduction

within 4-month follow-ups to models improved the f1 scores further to 0.6 ($P < 0.01$), with a better AUROC of 0.89 ($P < 0.01$).

Conclusion

Potential non-responders to SLT need early detection for timely topical medicines, and our data-driven machine learning method achieved an earlier and more precise detection.

THE ASYMMETRIC BINOCULAR VISUAL ACUITY RATHER THAN THE LEVEL OF VISUAL ACUITY AFFECTS ILLNESS PERCEPTIONS IN GLAUCOMA PATIENTS

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Introduction

To determine whether asymmetric binocular visual acuity has a greater impact on illness perceptions than vision acuity.

Methods

In this cross-sectional study, we recruited 97 patients diagnosed with glaucoma who had been using topical ocular medications to reduce intraocular pressure for at least 2 weeks. All participants completed the Brief Illness Perception Questionnaire (BIPQ) and a questionnaire regarding sociodemographic and clinical information. Two-sample t-test, ANOVA analysis, and generalised linear model analysis were performed.

Results

Patients with a disease duration of ≥ 2 years and <5 years (95% CI 1.222~9.219, P = 0.011), as well as patients with a disease duration of ≥ 5 years (95% CI 2.171~11.136, P = 0.004), have stronger illness perceptions compared to patients with a disease duration of less than 2 years. Patients with a history of glaucoma surgery have stronger illness perceptions compared to patients who have not undergone surgery (95% CI 1.496~11.721, P = 0.011). There is no significant difference in illness perception among patients with different levels of LogMAR in their better (95% CI -1.408~8.014, P = 0.169) and worse eyes (95% CI -3.255~2.045, P = 0.655). It is interesting to note that we have observed patients with asymmetric binocular visual acuity have a stronger perception of their illness compared to patients without asymmetric binocular visual acuity (95% CI 2.344~11.199, P = 0.003). Additionally, research has found that there is an interactive effect between surgical history and

asymmetric binocular visual acuity on illness perception (95%CI 3.518~13.934, P = 0.001).

Conclusion

Among glaucoma patients using medication, those who have undergone glaucoma surgical treatment and those with a longer disease duration tend to have a stronger illness perception. The asymmetric binocular visual acuity results in a stronger illness perception of glaucoma patients. This is particularly prominent among patients who have previously undergone glaucoma surgery. However, visual acuity does not have a significant impact on illness perception in glaucoma patients. It is important to highlight that patients with visual acuity impairment in both eyes may have their illness perception underestimated, thus requiring healthcare professionals to pay more attention to their needs.

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8. 79-x.

Tables and figures

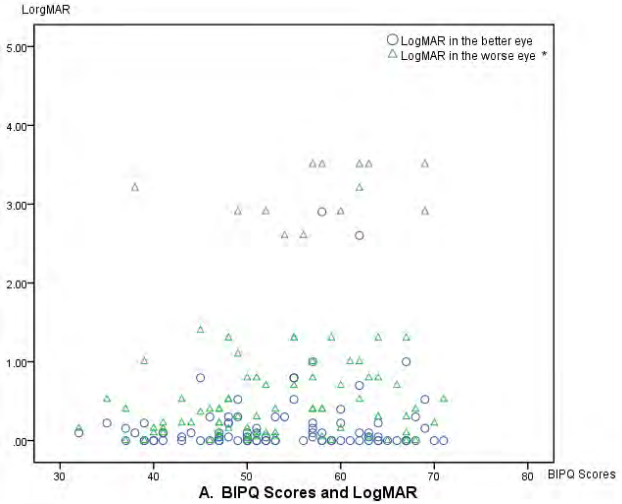
Table1 Sociodemographic and clinical characteristics

Characteristics	n (%)	BIPQ Scores Mean (SD)	t /F value	P-value
Gender			0.850	0.397
Female	49(54.4%)	52.65±9.6		
Male	41(45.6%)	54.37±9.5		
Educational level			4.093*	0.004
Illiterate	15(16.7%)	49.13±9.8		
Elementary school	29(32.2%)	50.48±8.1		
Middle school	21(23.3%)	54.33±9.6		
High school	7(7.8%)	56.14±10.0		
College or above	18(20.0%)	59.67±8.2		
Chronic comorbidities			0.578	0.565
No	54(60.0%)	53.91±9.8		
Yes	36(40.0%)	52.72±9.2		
Type of glaucoma			-2.352	0.021
Secondary glaucoma	26(28.9%)	57.04±8.6		
Primary glaucoma	64(71.1%)	51.97±9.5		
Family history			-2.638	0.017
No	81(90.0%)	53.94±9.8		
Yes	9(10.0%)	48.89±4.7		
Duration of glaucoma			11.613*	< 0.001
< 2 years（Ref）	49(54.4%)	49.47±8.8		
≥2years and <5 years	25(27.8%)	57.96±8.1		
≥ 5 years	16(17.8%)	58.50±8.2		
Surgical history			4.502	< 0.001
No	49(54.4%)	49.69±8.6		
Yes	41(45.6%)	57.90±8.7		
Asymmetric binocular visual acuity			2.507	0.014
No	37(41.1%)	50.51±9.6		
Yes	53(58.9%)	55.47±9.0		

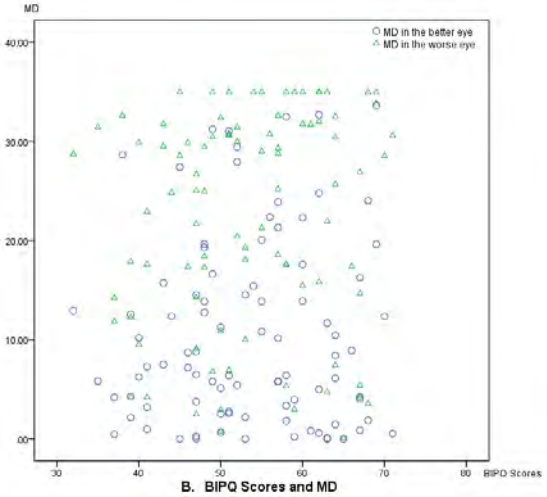
Table2 Results of the generalized linear models analysis on patients' illness perceptions

Variables	β	95%CI	P val
Age，years	-0.135	-0.273~0.003	0.0
Gender			
Female（Ref）			
Male	-0.766	-4.045 ~ 2.514	0.6
Educational level			
Illiterate（Ref）			
Elementary school	0.273	-4.559 ~5.105	0.9
Middle school	2.254	-2.938~7.445	0.3
High school	5.675	-1.169~12.520	0.1
College or above	3.700	-2.790~10.189	0.2
Chronic comorbidities			
No（Ref）			
Yes	0.015	-3.285~3.315	0.9
Type of glaucoma			
Secondary glaucoma （Ref）			
Primary glaucoma	0.624	-3.286~4.535	0.7
Family history			
No（Ref）			
Yes	-2.959	-8.326~2.409	0.2
Duration of glaucoma			
< 2 years（Ref）			
≥2years and <5 years	5.220	1.222~9.219	**0.0**
≥ 5 years	6.654	2.171~11.136	**0.0**
LogMAR in the better eye	3.303	-1.408~8.014	0.1
LogMAR in the worse eye	-0.605	-3.255~2.045	0.6
MD in the better eye	-0.158	-0.417~0.102	0.2
MD in the worse eye	0.068	-0.121~0.257	0.4
No surgical history* No asymmetric binocular visual acuity（Ref）			
Surgical history* No asymmetric binocular visual acuity	6.608	1.496~11.721	**0.0**
No surgical history* asymmetric binocular visual acuity	6.772	2.344~11.199	**0.0**
Surgical history* asymmetric binocular visual acuity	8.726	3.518~13.934	**0.0**

Figure 1. LogMAR, MD and BIPQ.



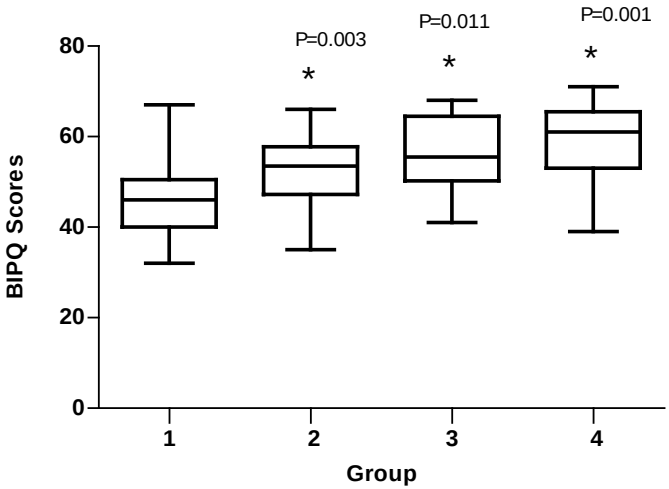
A. BIPQ Scores and LogMAR



B. BIPQ Scores and MD

logMAR in the better eye: r = 0.136, P = 0.200, logMAR in the worse eye: r = 0.242, P = 0.022. MD in the better eye: r = 0.055, P = 0.608, MD in the worse eye: r = 0.082, P = 0.444

Figure2 BIPQ Scores of Different Groups



Group 1: no surgical history and no asymmetric binocular visual acuity, Group 2: no surgical history and asymmetric binocular visual acuity, Group 3: surgical history and no asymmetric binocular visual acuity, Group 4: surgical history and asymmetric binocular visual acuity.

* Compared with Group 1, the difference was statistically significant.

Poster Presentations

CLINICAL PROFILE OF CHILDHOOD GLAUCOMA AT TERTIARY EYE CARE CENTRE IN SOUTH INDIA

A S[1]

[1]Aravind Eye Hospital and Postgraduate Institute of Ophthalmology

Purpose

To analyse the prevalence of various types of childhood glaucoma, their clinical presentation, and various treatment modalities.

Study Design

Retrospective study.

Methods

A total of 554 patients with childhood glaucoma that presented to our glaucoma clinic between January 2019 to December 2022 were analysed for this study.

Results

Out of 554 patients, 226 (40.8%) patients had primary glaucoma, of which 196 children had primary congenital glaucoma and 30 children had juvenile glaucoma. Secondary glaucoma constituted for 59.2% (328 patients) of which glaucoma associated with acquired conditions (22.20%) being most common, followed by glaucoma associated with non–acquired ocular anomalies (16%), glaucoma following cataract surgery (15%), and glaucoma associated with syndrome and systemic diseases (5.60%). Out of 558 patients, 289 patients underwent glaucoma surgeries. Trabeculectomy was the most common surgery performed for patients with primary childhood glaucoma (35.37%), followed by combined Trab + Trab (29%), trabeculotomy (28%), AADI (4.27%), and AGV (3%). AADI (56%) was the most

common surgery performed for patients with secondary childhood glaucoma followed by trabeculectomy (20%), trabeculotomy (10%), and AGV (8%).

Conclusion

In our retrospective study, we found that secondary glaucoma was the most common childhood glaucoma (59.92%) presented to our centre. Glaucoma associated with acquired conditions (22.20%) contributes the majority. Trabeculectomy was the most common surgery performed for patients with primary childhood glaucoma (35.37%). AADI (56%) was the most common surgery performed for patients with secondary childhood glaucoma.

Clinical Implication

These results indicate the need for early detection and referral of glaucoma cases in order to prevent significant visual loss. There is also a need for a community-based assessment to determine the prevalence of glaucoma as a baseline for future interventions.

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In our retrospective study, we found that Secondary glaucoma is the most common childhood glaucoma (59.92%) presented to our center , glaucoma associated with acquired conditions(22.20%) contributes the majority . Trabeculectomy being the most common surgery performed for patients with primary childhood glaucoma(35.37%). AADI(56%) being the most common surgery performed for patients with secondary childhood glaucoma.

Clinical Implication

These results indicate the need for early detection and referral of glaucoma cases in order to prevent significant visual loss. There is also a need for a community based assessment to determine the prevalence of glaucoma as a baseline for future intervention.

SUCCESSFUL OUTCOMES OF MICROPULSE LASER TRABECULOPLASTY IN PRIMARY OPEN-ANGLE GLAUCOMA PATIENTS AFTER GLAUCOMA SURGERY: A CASE SERIES

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Introduction

MicroPulse laser trabeculoplasty (MLT) has been proposed as an alternative to topical eye drops for the first-line treatment of primary open-angle glaucoma (POAG). To our knowledge, there is no data on MLT results specifically in patients after glaucoma procedures. This report aims to show successful MLT outcomes in 2 POAG patients undergoing previous glaucoma surgery.

Methods

A prospective study of 2 POAG patients who underwent MLT after glaucoma surgery. 577-nm MLT was performed by a glaucoma specialist with 1000 mW laser power, 300 ms micropulse duration, 15% duty cycle, 300 µm spot size diameter, and 120 laser spots distributed in 360° of the pigmented trabecular meshwork. The main outcome measures were glaucoma medication use and intraocular pressure.

Results

The first patient was a 55-year-old woman with advanced glaucoma. A trabeculectomy in her left eye was performed 22 years ago. The IOP was 15 mmHg with prostaglandin analog and beta blocker eye drops before MLT. Six weeks after the procedure, the IOP decreased to 13 mmHg with only prostaglandin analog eye drops once daily.

The second patient was a 59-year-old woman with moderate glaucoma with Virna Glaucoma Implant (VGI) surgery in her left eye performed 5 months before

prenetation. The IOP was 16 mmHg with prostaglandin analog and beta blocker eye drops before MLT. Six weeks after the procedure, the IOP decreased to 14 mmHg with only prostaglandin analog eye drops once daily. No IOP spikes and adverse events were reported in either patient.

Conclusion

MLT has successfully reduced one antiglaucoma eyedrop with stable IOP in POAG patients after glaucoma surgery. This reduction is expected to improve the patient's quality of life by avoiding drug-induced toxicity and reducing the cost of therapy. MLT may also postpone additional surgical intervention in POAG patients. No adverse event was reported in the 6-week follow-up after treatment.

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ABILITY OF TEMPORAL RAPHE SIGN VERSUS MACULAR GANGLION CELL LAYER THICKNESS IN DISCRIMINATING GLAUCOMA FROM OTHER OPTIC NEUROPATHY

Aquino L[123], Aquino N[1], Kho R[1], [3]Richard C. Kho[1,3,4] and Norman Marquez Aquino[1,3,4]

[1]American Eye Center, [2]Department of Ophthalmology and Visual Sciences, Philippine General Hospital, Manila, National Capital Region, Philippines, [3]The Medical City South Luzon, Santa Rosa, Laguna, Philippines, [1]American Eye Center, Mandaluyong, National Capital Region, Philippines, [4]Eye and Vision Institute, The Medical City, Mandaluyong, National Capital Region, Philippines

Introduction

Glaucomatous and non-glaucomatous optic neuropathies can present with similar features on clinical examination. This study aims to compare the discriminatory abilities of the temporal raphe sign and measurement of macular ganglion cell layer thickness in distinguishing between the 2.

Methods

This was a single-centre, cross-sectional, retrospective study. Subjects were recruited from a single institution and underwent spectral-domain optical coherence tomography (OCT) scan of the macular ganglion cell layer. A total of 148 eyes from 88 subjects were randomly included and sorted into glaucomatous and non-glaucomatous optic neuropathy groups (GON and NGON) based on clinical findings. The presence of the temporal raphe sign was independently verified by 2 ophthalmologists. Discriminatory ability was measured via area under receiver operating curves (AUC).

Results

In the GON group, temporal raphe sign was seen in 32 of 63 eyes (51%). This was compared to 16 of 85 eyes (19%) in the NGON group ($P < 0.001$; Chi square test). Temporal raphe sign positivity had an AUC value of 0.660 ($P < 0.015$, 95% confidence interval; 0.569–0.751) indicating positive discriminatory ability. AUC values were

lower for mGCL thickness, ranging from 0.213–0.614. The highest AUC value of 0.614 ($P < 0.01$; 95% confidence interval; 0.522–0.706) for mGCL thickness measurements was seen in the inferonasal sector.

Conclusion

The presence of the temporal raphe sign on OCT shows better utility in discriminating a glaucomatous versus a non-glaucomatous optic neuropathy compared to measuring mGCL thickness alone. This can aid clinicians especially in the presence of equivocal optic disc findings.

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CHALLENGING MANAGEMENT OF MALIGNANT GLAUCOMA IN PRIMARY ANGLE-CLOSURE GLAUCOMA PATIENT

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[1]Ciptomangunkusumo Hospital, Indonesia

Introduction

Malignant glaucoma is characterized by rise in intraocular pressure (IOP) and shallow anterior chamber despites patent iridectomy.[1] It is one of the most challenging forms of glaucoma to manage.

Methods

The objective of this case report is to highlight approaches in management of malignant glaucoma.

Results

A 31-year-old female was referred with chronic primary angle-closure glaucoma. Her presenting visual acuity of was hand movement on right eye (RE) and 6/9 of left eye (LE), with IOP 23 mmHg and 18 mmHg, and cup-to-disc ratio 1.0 and 0.6–0.7, respectively. Gonioscopy of both eyes (BE) revealed grade-0 with peripheral anterior synechiae. Patient was on latanoprost, timolol, and brinzolamide on BE. Trabeculectomy with mitomycin-C was performed on LE, with results IOP of LE 11 mmHg, von-Herrick-1, and diffuse bleb 2 weeks postoperatively. She was suspected with malignant glaucoma but unfortunately lost to follow-up and returned after 6 months. Upon returning, IOP of LE was 35 mmHg, with VH-0, patent iridectomy and diffuse bleb, despites oral acetazolamide, timolol, latanoprost, and brinzolamide, and atropine 1%. Phacoemulsification, synechiolysis, and anterior chamber reformation was performed with prior sclerotomy to reduce pressure. Post phacoemulsification, IOP was 32 mmHg despite full antiglaucoma medication and Virna glaucoma implant (VGI) was planned. After VGI, anterior chamber was still flat with IOP of LE was 25 mmHg. Patient underwent iridectomy, synechiolysis, and

anterior vitrectomy but with anterior chamber returned flat postoperatively. We consulted to vitreoretinal division, core vitrectomy and mechanical posterior vitreous detachment was performed. At 1-week postoperative, visual acuity was 6/9, with IOP 24 mmHg, and formed anterior chamber.

Conclusion

This case report demonstrates malignant glaucoma management that resolved with hyaloid vitrectomy.

References

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VISUAL IMPROVEMENT IN PATIENT WITH SECONDARY GLAUCOMA CAUSED BY LENS SUBLUXATION: A CASE REPORT

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Introduction

Lens-induced glaucoma is a secondary glaucoma caused by crystalline lens involved in the mechanism of intraocular pressure (IOP) increase. Lens subluxation is the most common of lens-induced glaucoma caused by pupillary block. Lens extraction is the definitive treatment of lens-induced glaucoma. The purpose of study is to report the visual improvement in patient with secondary glaucoma caused by lens subluxation due to cataract extraction.

Methods

A 57-year-old man complained of blurred vision in the left eye and getting worse for 1 year. He came with pain, red eyes, and headache. The visual acuity (VA) was 6/60 S+3.00 6/40 NBC in right eye (RE) and good light perception in left eye (LE). The IOP was 18.3 mmHg in RE and 46.9 mmHg in LE. In LE, we found conjunctival hyperaemia, corneal oedema, shallow anterior chamber, mid-dilated pupil, negative pupillary reflex, and lens subluxation. There was no posterior segment abnormality from ultrasonography B-Scan. We diagnosed with secondary glaucoma caused by lens subluxation. The patient administered acetazolamide 250 mg, topical timolol maleate 0.5%, and topical prednisolone acetate 1%. We did intracapsular cataract extraction (ICCE) without intraocular lens (IOL) and debulking vitrectomy as a definitive therapy. Three months later, we did secondary implant surgery.

Results

Two months post-secondary implant, visual improvement was obtained become 6/15 NBC with S+2.50 C-3.00 X90 in LE. Improvement of the IOP also was found, with 16 mmHg. Anterior and posterior segment were stable, and IOL position was good.

Conclusions

Cataract extraction as a definitive treatment should be done when IOP and inflammation is controlled. When the IOP is well controlled, the anterior and posterior segment is stable, and IOL is in good position and fixation, visual improvement will be achieved.

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AN AUDIT REPORT OF PREOPERATIVE CARDIOLOGY REFERRALS IN THE DEPARTMENT OF OPHTHALMOLOGY OF UNIVERSITY OF MALAYA MEDICAL CENTRE

Bamadhaj H, Marium, Sujaya

Department of Ophthalmology, University Malaya Medical Centre

Introduction

Patients planned for surgery in the department of ophthalmology require a thorough preoperative evaluation and assessment prior to surgery. However, due to an overwhelming number of patients undergoing surgery in the department, this has caused an increasing number of referrals to the cardiology clinic, which leads to a backlog of patients requiring cardiac assessment prior to surgery. To overcome this situation, the cardiology department with the assistance of the Anaesthesiology department created with a comprehensive protocol of cardiac referral to minimize and better manage the preoperative assessment.

Methods

This audit was done based on reviewing patients with underlying cardiology illness or those who needed cardiology review/assessment prior to ophthalmology surgery from April 2021 to April 2022.

Results

The audit managed to show that the protocol of referral to the cardiology department for cardiac assessment managed to reduce the number of patients needing cardiac assessment prior to surgery. The protocol allowed the preoperative assessment to run smoothly. Phone call consultations with the cardiology consultants also enabled the primary team to manage patients appropriately. This as a result reduced waiting time and cardiology clinic referrals.

Conclusion

This audit revealed that the cardiology protocol enabled the ophthalmology medical officers to better plan and advice patients accordingly during the preoperative clinic and managed to reduce the burden of the cardiology clinic. Consultations via phone are truly beneficial since prompt management advice can be given immediately and this leads to reducing the amount of operation cancellation rates due to waiting time for cardiologist review. This also reduces unnecessary referrals to the cardiology clinic.

References

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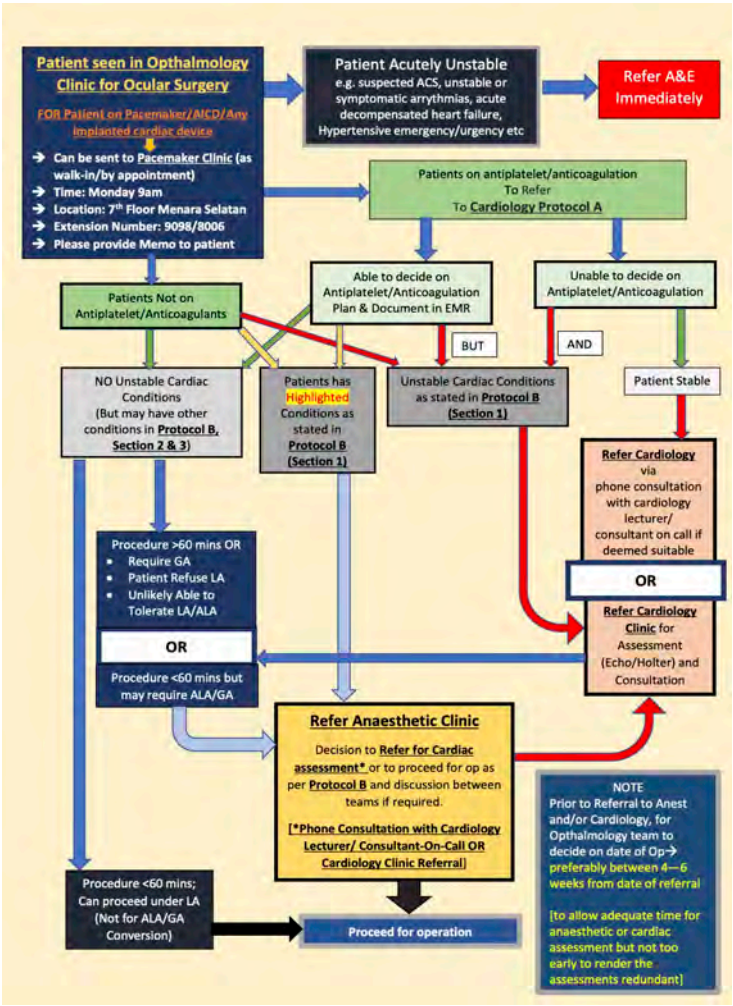
Figures

Figure 1. Cardiology case referral protocol.



Cardiac referral (Ophtalmology patients)

Protocol A:

Guidance in antiplatelets/anticoagulants
Patients on dual antiplatelet medications Cataract surgery should be deferred until DAPT is reduced to single antiplatelets. **Patients on Anticoagulants for AF (NOACs or Warfarin)** Anticoagulant therapy can be stopped prior to cataract surgery without the need for overlapping IV Heparin. NOACs can be stopped 48 hours prior to surgery. Warfarin usually takes 5-7 days for the effect to wear off. All anticoagulants should be started post OP at the usual dose once the surgical bleeding risk has subsided. **Patients on Warfarin for prosthetic valves** Patients with prosthetic valves cannot stop Warfarin. Consultation is required. **Patients on single antiplatelets** If required for surgery, the medications can be stopped 5-7 days prior to surgery. A risk of stent thrombosis of about 3% should be quoted. Antiplatelet medications should be restarted post OP at the usual dose once the surgical bleeding risk has subsided.

Protocol B:

Patient conditions (Section 1) Potentially Unstable Cardiac Conditions	Expected Duration of Surgery	Planned Anaesthetic Techniques	Action
1. **Unstable IHD** (Signs and symptoms e.g. chest pain at rest) (Diagnosed or Undiagnosed) 2. **Orthopnea** 3. **Syncopal attacks** (unprovoked, from postural changes or palpitations) 4. **Decompensated cardiac failure** (with clinical S & S) 5. **Unexplained shortness of breath** OR **Cardiac symptoms** that are clinically difficult to differentiate its origin (e.g., lungs, heart, kidney or psychogenic) 6. **Complex anticoagulant/antiplatelet management** (phone consult or cardiac referral) 7. **History of underlying cardiac disease and not well optimized** 8. **Unexplained palpitations** 9. **Suspicious ECG changes* but clinically asymptomatic** e.g. ventricular ectopics, bigeminy, trigeminy (not exhaustive list—to be discussed with anesthetic and/or cardiology consultant in charge that day)	Regardless	Regardless	Refer for Cardiac Assessment And / Or Consultation ***Please do refer this group of patients to anaesthetic clinic for assessment post cardiac assessment unless operation is done under LA strictly.** **Note:** If patient found to have highlighted conditions by ophthalmology team →can refer patient to **anaesthetic clinic (call ext 3785)** for assessment on same day (if walk-in slot available) →preferably with a **tentative surgery date, baseline IX and ECG**

<table>
<tr><th>Patient conditions (Section 2)</th><th>Expected Duration of Surgery</th><th>Planned Anaesthetic Techniques</th><th>Action</th></tr>
<tr><td rowspan="3">1. Stable IHD (e.g chest pain on moderate to severe exertion; with or without pre-existing diagnosis)
2. Unsure of functional status/ADL dependent and MACE >1% (As per ACC/AHA guidelines)
3. Chronic or severe medical conditions that might affect cardiac function
A. Lung diseases: severe COPD, Pulmonary fibrosis, or
B. Endocrine: thyroid dysfunctions
4. Murmur (newly detected, asymptomatic)
5. Cardiomegaly on CXR
6. Pre-existing heart conditions but defaulted treatment/follow-up, otherwise clinically well-controlled
7. Abnormal ECG
Some Examples:
• Not suggestive of acute coronary events e.g. Q wave, ST depressions but clinically asymptomatic or no raised troponin;
• occasional ventricular or atrial ectopics etc
BUT
• Patient is able to lie flat for prolonged period of time (without feeling claustrophobic, pain, shortness of breath or any other discomfort requiring ALA or GA)
OR WITH
• Recent history of able to tolerate operation under LA or ALA (within 2 years) & no major cardiac event/hospitalizations/new symptoms from previous operation till now</td><td>>60 mins

OR</td><td>Procedure requiring GA OR may require conversion from ALA to GA

Patient refuse or unlikely to be able to tolerate LA or ALA</td><td>Refer for Cardiac Assessment And/Or Consultation</td></tr>
<tr><td><60 mins

OR</td><td>If surgeon wish to proceed with ALA</td><td>Cardiac referral requirement will be assessed by the anesthetist in charge and individualized according to patient.</td></tr>
<tr><td>If to proceed strictly under LA (absolutely not for ALA or GA conversion)

*Pre-op:
If decided to change to ALA/GA after patient being admitted→ may cause postponement of surgery for cardiac referral and optimization

*Intra-op:
In the event of inadvertent conversion to ALA/GA on table, both patient and surgical team need to understand that it may pose significant risk for this group of patients.</td><td>Not required for echo or cardiac assessment</td></tr>
</table>

Patient conditions (Section 3)	Expected Duration of Surgery	Planned Anaesthetic Techniques	Action

• Asymptomatic or stable IHD
  ○ on medical therapy
  ○ with stents
  ○ Post CABG
• On regular follow up with cardiologists and has recent follow up (within 6 months OR within 1 year with no major cardiac event)
• METS> or =4
• No unexplained palpitation, syncopal attacks or new onset chest pain
	Regardless	Regardless	Not required for echo or cardiac assessment

MANAGEMENT OF A DUPLEX OF CASES WITH AQUEOUS MISDIRECTION SYNDROME

Bhatta S[1], Hassan F[1]

[1]Aberdeen Royal Infirmary

Introduction

Aqueous misdirection syndrome (AMS) is a rare complication with an incidence of 0.4–6% following incisional glaucoma surgery. Several theories exist regarding the pathophysiology of this condition, but the premise is that posterior vitreous pressure exerts a force on the anterior hyaloid, causing a forward displacement of the lens-iris diaphragm and shallowing of the anterior chamber in the presence of a patent iridotomy and normal posterior segment.

Method

Case 1: An 80-year-old Caucasian was treated successfully for acute angle-closure glaucoma (ACG) with iridotomy and cataract extraction in the left eye. The visual acuity (VA) was 6/15 and intraocular pressure (IOP) was 42 mmHg with advanced visual field defect for which he underwent trabeculectomy. On first postoperative day, the anterior chamber was flat, IOP measured 21 mmHg with a poorly formed bleb.

Case 2: A 78-year-old Caucasian, with acute ACG, previous iridotomy, and cataract extraction, VA of 6/7.5, IOP 30 mmHg and advanced field defect underwent trabeculectomy in her right eye. On first postoperative day, the anterior chamber was shallow, the IOP was 45 mmHg with a flat bleb.

Results

A clinical diagnosis of AMS was made. Treatment was initiated with prednisolone 1%, atropine 1%, and dorzolamide/timolol eye drops. In case 1, YAG laser capsulotomy and anterior hyaloidotomy led to deepening of the anterior chamber and lowering of IOP to 14 mmHg but the signs of AMS recurred after 4 weeks and IOP

spiked to 25 mmHg. Both patients underwent pars plana vitrectomy and anterior hylaoidectomy and responded well with deepening of the anterior chamber, lowering of IOP to 14 and 10 mmHg, respectively, at 6 months.

Conclusion

Both cases demonstrate the importance of prompt clinical diagnosis and appropriate medical and surgical management leading to a favourable outcome in a potentially refractory and visually debilitating condition following trabeculectomy surgery in predisposed eyes.

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INCIDENCE OF INFECTION AND TUBE EROSION FOLLOWING GLAUCOMA DRAINAGE DEVICE SURGERY: A RETROSPECTIVE ANALYSIS

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Introduction

Infection is one of the most common vision-threatening complications of glaucoma drainage device (GDD) surgery, and tube erosion is the most common risk factor known so far. This study evaluates the incidence of infection and tube erosion after GDD surgery in a tertiary referral hospital.

Methods

Medical records of patients who underwent GDD surgery from January to December 2019 were reviewed retrospectively for demographic profile, clinical details, and visual outcome. The incidence of infection, tube erosion, graft use in GDD, and visual outcome were analysed.

Results

One hundred fourteen eyes were included in this study. Three cases of infected grafts, one case of endophthalmitis, and one case of preseptal cellulitis with conjunctival abscess were identified. All cases used scleral patch grafts from remnant keratoplasty and were operated on within two weeks. In 4 out of 5 infection cases, *Pseudomonas aeruginosa* was isolated as the causative agent. Infection management consisted of implant explantation, and the visual outcome varied

according to infection type. Additionally, tube erosion was detected in 7 cases, although infection did not ensue in any of these instances.

Conclusion

Tube erosion does not pose a risk for infection within our hospital setting. The possibility of infection exists with scleral grafts. Hence, it is vital to oversee scleral graft handling to prevent infections. An alternative approach involving a scleral flap and pericardium could also be considered for infection prevention. Prompt action is essential in addressing both tube erosion and infection incidents.

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EFFECTS OF TOPICAL ROCK INHIBITOR ON RETINAL GANGLION CELLS IN NERVE CRUSH MODEL

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Introduction

The Rho-associated kinase (ROCK) inhibitor is the latest drug class that was developed as a novel anti-glaucoma medication.[1] Several of its effects reported include control of aqueous outflow, protection of trabecular meshwork cells from oxidative stress, improvement of blood flow to the optic nerve, as well as neuroprotection.[2] Y-27632, an example of a ROCK inhibitor, is a potential retinal ganglion cell (RGC) protectant apart from its intraocular pressure (IOP)-lowering effect, although its exact mechanism has not been fully elucidated. This study investigated the neuroprotective effects of topically applied ROCK inhibitor Y-27632 to murine RGCs damaged by optic nerve crush (NC).

Methods

We employed a unilateral NC model of mice. A ROCK inhibitor, Y-27632 of 100 mM, or saline was applied topically once daily for 14 days to experimental eyes. The effect was then evaluated by counting the survived RGCs of enucleated flat retinal tissues according to retinal orientation, measuring the inner retinal thickness using optical coherent tomography (OCT), and the magnitude of electroretinogram (ERG). IOP monitoring was done.

Results

Y-27632 showed neuroprotective effects in terms of significant improvement of the survived RGCs by approximately 7% (Fig. 1). The OCT and ERG findings also supported a Y-27632-induced neuroprotective effect. Y-27632 reduced the IOP by approximately 12% (Fig. 2).

Conclusion

A ROCK inhibitor, Y-27632, may exert some neuroprotective effect to the RGCs when used as eyedrops through an IOP-independent neuroprotective action to the RGCs.

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Tables, Figures, and Illustrations

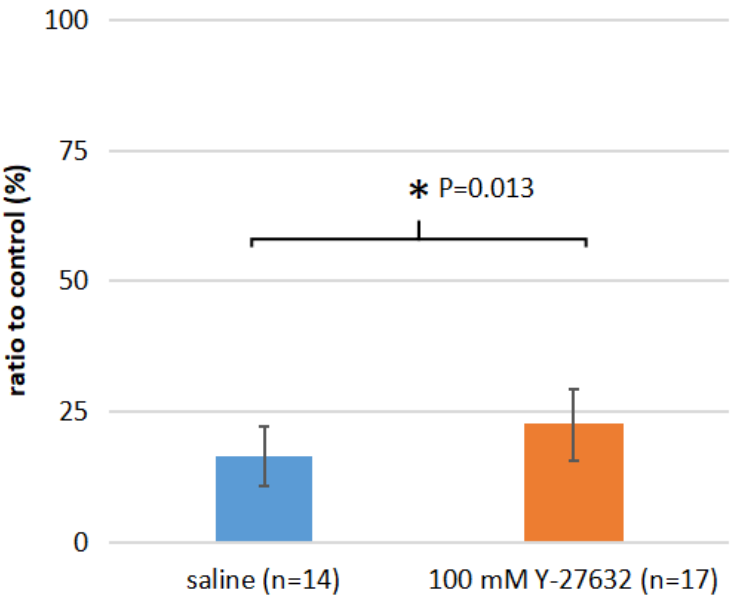

Figure 1. Cell counting ratio of CFP-positive-RGCs.

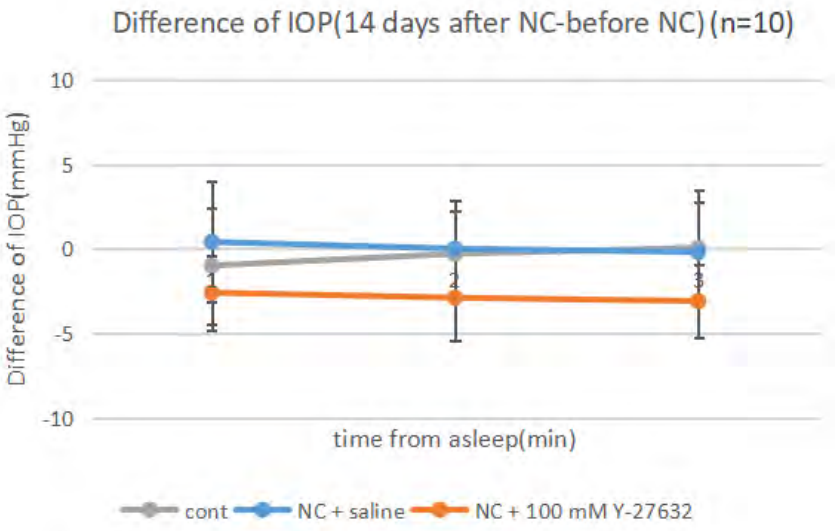

Figure 2. Average IOP before and after NC with 100 mM Y-27632 or saline treatment by eye drops.

A SIX-MONTH PROPENSITY SCORE-MATCHED ANALYSIS OF ISTENT INJECT COMBINED WITH PHACOEMULSIFICATION VERSUS PHACOEMULSIFICATION ALONE IN ASIAN EYES WITH NORMAL TENSION GLAUCOMA

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Introduction

In previous studies, Asian eyes with normal-tension glaucoma (NTG) implanted with combined phacoemulsification and iStent Inject/iStent Inject W (combo) demonstrated intraocular pressure (IOP) lowering and medication reductions.[1,2] This ambispective study compared IOP and medication changes in NTG eyes undergoing combo versus phacoemulsification alone (control).

Methods

Baseline characteristics, IOP, and medication numbers at preoperative and postoperative time points up to Month (POM) 6 were obtained from medical records in NTG eyes with combo or control procedures conducted from January 2020 to May 2023. Propensity score matching created similar groups based on age, preoperative IOP and medications, and Humphrey visual field mean deviation in eyes with POM6 data. Multilevel mixed-effects regression modelling estimated treatment effects on IOP and medications. Chi-Square test was used to analyse treatment effects on proportion of eyes achieving medication or target IOP success criteria.

Results

Our study incorporated 61 patients/93 eyes undergoing the combo procedure and 65 patients/105 eyes constituting the control group. Post-matching, no differences were discerned in baseline characteristics in combo (28 patients/41 eyes) and control groups (31 patients/41 eyes). Mean changes in IOP over time revealed no significant differences between groups, except for Day 1. Notably, combo group

exhibited more pronounced reduction in medication usage at all time points, except POM3 (Figure 1). At POM6, 55.2% of combo group eyes achieved medication reduction compared to 17.1% in control group eyes. (P = 0.001).

Conclusion

iStent Inject with phacoemulsification may alleviate medication burden in Asian NTG eyes. These early comparative results underscore the potential role of iStent *inject* in enhancing therapeutic outcomes and improving glaucoma management in NTG patients.

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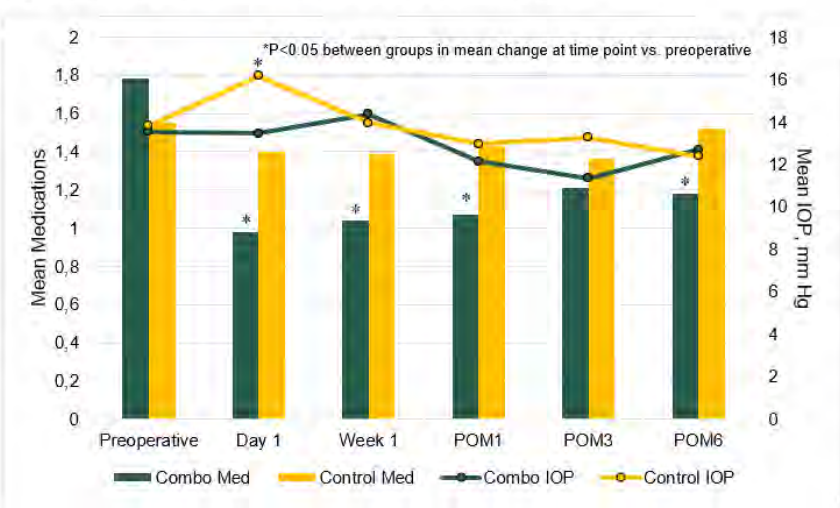
Figures

Figure 1. Mean IOP and medications in NTG combo and control group.



OUTCOMES FROM THE AUSTRALIAN STANDALONE 3 ISTENT W CLINICAL TRIAL

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Introduction

To report intermediate outcomes from the trial of 3 iStent Inject W as a standalone treatment for glaucoma.

Methods

In this prospective, multicentre study, patients with glaucoma underwent implantation of 3 iStent Inject W as a standalone treatment. Outcomes of interest included change in intraocular pressure (IOP), change in medication, and adverse events up to 24 months following surgery. Outcomes up to 18 months after surgery are available so far.

Results

Sixty-five eyes from 52 patients underwent surgery with outcomes available for the 6-month (n = 27), 12-month (n = 12), and 18-month (n = 5) follow-up. Baseline IOP and number of medications was 17.41 mmHg and 2.54, respectively, with mean cup-disc ratio of 0.75 and a visual field mean deviation -5.13 dB. Mean IOP and mean number of medications were reduced by 12.8% and 44.5% respectively at 6 months and reductions were maintained out to 18 months (18.7% and 73.7%, respectively). There have been no stent-related complications documented at either of the 3 follow-up visits so far. However, 1 eye went on to have glaucoma filtration surgery because the IOP target was not met.

Conclusions

Intermediate results from this prospective study show 3 iStent Inject W as a standalone procedure is associated with significant IOP and medication reduction

up to 18 months after surgery. No stent-related complications have been identified so far.

INTRAOCULAR PRESSURE CONTROL FOLLOWING CATARACT SURGERY IN FILIPINO PATIENTS WITH PRIMARY ANGLE-CLOSURE DISEASE

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Introduction

The beneficial role of cataract surgery in intraocular pressure reduction and the associated mechanisms has been the subject of different studies.

Methods

This is a retrospective, single-centre study which aims to investigate the effect of phacoemulsification on the intraocular pressure control in Filipino cataract patients with primary angle-closure disease (PACD) in a tertiary hospital.

Results

Results showed that the mean preoperative IOP of PACD patients is 16.7 (SD = 4.2) which significantly went down to 12.7 postoperatively. Statistical analysis has shown that IOP reduction postoperatively is significantly higher in the ACD group (3.7 mmHg) compared to the healthy group (1.4 mmHg). The PACS and PAC sub-groups had the largest IOP reduction of 4.2 mmHg (24.41%) and 4.1 mmHg (23.16%) respectively, while the PACG group had lower drop in IOP of 1.7 mmHg (13.08%).

Conclusion

The change in IOP after phacoemulsification in Filipino cataract patients with narrow angles was significantly higher compared with healthy patients over the course of their follow-up. Thus, cataract surgery may be offered in patients with visually significant cataract and narrow angles who would benefit most from the IOP lowering effect of cataract removal. Moreover, cataract surgery, being a simpler procedure, and having a more predictable course and outcome postoperatively

compared to glaucoma filtering surgeries, may be considered as an alternative management option in areas with limited access to glaucoma care.

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Tables

Appendix:

Table 1: Amount of IOP Change - Comparison between PACD and Healthy Group

Table 1.1 PACD and Healthy Groups

	PACD Group (n=25)	Healthy Group (n=126)	p value
IOP, Pre-Operative (mmHg)	16.7 ± 4.2	14.2 ± 1.9	-
IOP, Post-Operative (mmHg)	12.7 ± 2.2	12.8 ± 1.9	-
paired samples	25	126	-
p value	0.0001	0.0001	-
	PACD Group (n=25)	**Healthy Group (n=126)**	**p value**
Amount of Change	3.7 ± 3.5	1.4 ± 1.5	0.0001

Pre Op minus Post Op

Table 1.2 Sub Group Analysis:

	paired samples	IOP, Pre-Operative	IOP, Post-Operative	% IOP reduction	p value
Primary Angle Closure Suspect (PACS)	9	17.2 ± 3.7	13.0 ± 2.3	24.41	0.0053*
Primary Angle Closure (PAC)	10	17.7 ± 4.8	13.6 ± 2.7	23.16	0.0092*
Primary Angle Closure Glaucoma (PACG)	6	13.0 ± 1.4	11.3 ± 0.96	13.08	0.2351

*significant, ns not significant

Table 2: Univariate and Multivariate Analysis of Baseline and Clinical Characteristics:

	Univariate			Multivariate		
	Coef	**SE**	**p**	**Coef**	**SE**	**p**
Type of Patients						
PACD	0.13	0.45	0.7731^{ns}	-1.25	0.41	0.00
Healthy		Reference			Reference	
Age (years),	-0.0063	0.02	0.7576^{ns}	0.007	0.02	0.68
Sex						
Male	-0.5413	0.35	0.1282^{ns}	-0.5218	0.28	0.06
Female		Reference			Reference	
Comorbid						
Without Comorbid		Reference			Reference	
With Comorbid	0.7164	0.34	0.0347*	0.5471	0.2687	0.04
Hypertension	0.6066	0.33	0.0687^{ns}	-	-	-
Diabetes Mellitus	0.3819	0.37	0.3022^{ns}	-	-	-
Pre Op IOP	0.4655	0.05	0.0001*	0.539	0.05	0.00
Visual acuity, logmar	0.1599	0.92	0.8629	-0.954	0.75	0.205

**significant, ns not significant*

PHACOMATOSIS PIGMENTO-VASCULARIS: UNRAVELLING THE CLINICAL AND DEMOGRAPHIC PROFILE OF A RARE CONGENITAL MALFORMATION SYNDROME : A COMPREHENSIVE SERIES

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Introduction

Phacomatosis pigmento-vascularis (PPV) is a rare neurocutaneous syndrome characterized by the coexistence of pigmentary nevi and capillary malformations, often accompanied by multisystemic involvement.[1] Ocular manifestations in PPV are strongly associated with glaucoma. This retrospective case study analyses the clinical profile and demographics of the largest cohort of PPV patients to date.

Methods

A retrospective study conducted over a 27-year period (1996-2023). We examined 71 patients (137 eyes) with PPV at a tertiary care centre.

Results

Findings from structured case records revealed a patient population consisting of 22 females (30.9%) and 49 males (69.1%), with a median age of 1 year (range: 4 days to 40 years). All patients exhibited bilateral pigmentary and vascular malformations, with 70.4% presenting with bilateral glaucoma and 29.5% with unilateral glaucoma. Median visual acuity and intraocular pressure at presentation were documented. Systemic abnormalities, including epilepsy and MRI abnormalities, were observed in a significant proportion (44%) of patients. Surgical intervention for intraocular pressure control was necessary in approximately two-thirds of the patients, 76% underwent combined trabeculotomy with trabeculectomy and 22% trabeculectomy. Post-surgical outcomes indicated a significant reduction in antiglaucoma medication use and intraocular pressure. However, surgical complications occurred in 13% eyes, some of which were sight threatening.

Conclusion

In this PPV cohort, a majority of patients presented with bilateral glaucoma and systemic abnormalities. Approximately two-thirds of patients required glaucoma surgery, with a few sight-threatening complications. This study emphasizes the importance of detailed ocular and systemic evaluation including imaging of the brain in every patient of PPV and need for close follow-up for glaucoma.

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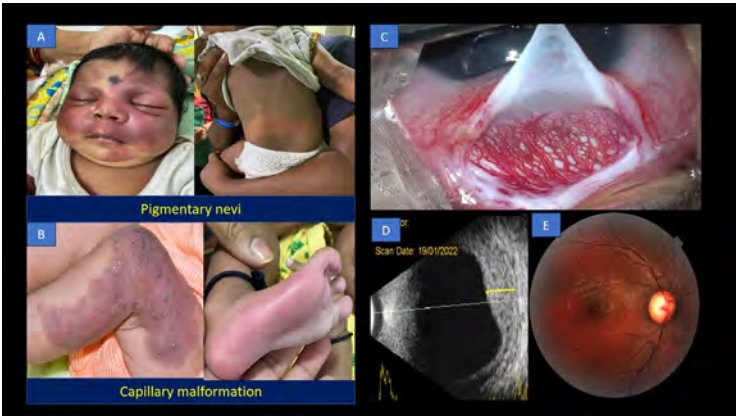
Figures

Figure 1. Cutaneous and ocular manifestations in PPV. (A,B) Skin manifestations of pigmentary nevi and capillary malformations. (C-E) Ocular capillary malformations leading to glaucoma (C), increased choroidal thickness on B-scan, and increased red glow indicating choroidal haemangioma (D and E)



"THROUGH THE EYES OF A CHILD": A *FOXC1* GENE-RELATED PRIMARY CONGENITAL GLAUCOMA

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Introduction

This paper aims to discuss a case of primary congenital glaucoma (PCG) managed holistically. This report calls attention to the importance of comprehensive evaluation, early recognition, genetic counselling, and adequate management of such a visually disabling disease.

Methods

Examination under anaesthesia confirmed our working diagnosis of bilateral PCG. Patient underwent glaucoma drainage device placement on the right eye and goniotomy on the left. The patient was also referred to an ocular geneticist where testing and counselling was done.

Results

Glaucoma surgery has been successful in lowering increase in intraocular pressure. *A FOXC1* gene mutation was detected in our patient. This *FOXC1* variant (c.532G>C (p.Asp178His) has not yet been reported in literature in individuals with PCG.

Conclusion

PCG is a debilitating disorder caused by increased IOP in infants. A comprehensive approach to history taking and ophthalmological examination in patients who manifest with these symptoms is crucial to curb the progression of this sight-threatening disease. Thus, detection of symptoms early in this patient was key to a timely treatment course.

PCG carries a poor prognosis if left unmanaged but holds a favourable outcome if treated without delay. This case illustrates how a high index of suspicion along appropriate management may help curtail such an ill- fated disease. This *FOXC1* variant has not yet been reported in literature in individuals with PCG. With ongoing genetic studies, it may be the first in the Philippines if proven pathogenic.

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TEN-MINUTE MINIMALLY INVASIVE GLAUCOMA SURGERY WITHOUT IMPLANT DEVICE

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Introduction

Transconjunctival limbotomy-iridotomy ablation procedure (TLIAP) is a quick and cost-effective MIGS that redirects aqueous humour from the eye's chambers to the subconjunctival network. It doesn't require an implant device and is suitable for both open and closed-angle glaucoma patients with viable conjunctiva.

Methods

Design: Retrospective, non-comparative, interventional case series.
Inclusion criteria: Patients diagnosed with non-neovascular glaucoma who underwent TLIAP with a minimum follow-up of 1 month.

Procedure

Case records reviewed for demographic data. The main outcomes included intraocular pressure (IOP) and the number of anti-glaucoma meds (AGM).
Primary outcome measures: Complete success was postoperative IOP of ≥ 6 and ≤ 18 mmHg. Qualified success obtaining the same postoperative IOP range with AGMs. Failure was not falling in the IOP range.

Data Analysis

Descriptive statistics summarized the data. Categorical variables were described using frequency and percentage, while continuous variables were described using mean, median, standard deviation, and ranges. Normality was tested with the Shapiro-Wilk test. Paired t-test compared intraocular pressure for normally distributed data and Wilcoxon signed-rank test for non-normally distributed data. Survival analysis was conducted using the Kaplan-Meier method.

Results

The study involved 29 patients (31 eyes), with a mean age of 59.74 ±1 8.45 years old and a median follow-up of 4 weeks (1–48 weeks). The preoperative IOP mean was 33.52 ± 11.03 mmHg, which significantly decreased to 11.97 ± 6.45 mmHg at week 1 (p = < 0.0001), with a mean difference of 21.55 mmHg. At 12 months, the IOP had dropped to 16.75 ± 6.65 mmHg, with AGMs decreasing from 3.6 ± 0.50 to 1 AGM. The intervention's success rate was 85.7% after 12 months, as seen in Figure 1.

Discussion

Limitations of the study: retrospective, short follow-up, heterogenous.

Conclusion

Short-term outcome shows that TLIAP is safe and effective in treating glaucoma.

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Tables

Table 1. Comparison of Intraocular Pressure (IOP) and Number of AGMs

Follow – up Period (n)	Mean IOP	Mean Difference (IOP)	p-value (IOP)	No. of AGM
Preop (31)	33.52±11.03			3.6±0.50
Week 1 (31)	11.97±6.45	21.55	<0.0001*	2.0±0
Week 2 (31)	12.87±8.17	-0.90	0.760ns	1.7±0.52
Week 3 (25)	13.60±8.60	-1.16	0.222ns	2.0±0.71
Week 4 (23)	15.13±9.41	-0.60	0.833ns	1.9±0.90
Week 6 (21)	14.48±9.08	0.75	0.888ns	2.0±1.27
2 months (18)	13.06±5.83	2.43	0.339ns	1.3±0.60
3 months (15)	14.20±5.97	-1.14	0.384ns	1.7±1.15
4 months (13)	12.54±3.73	2.50	0.136ns	2.0±1.41
5 months (10)	12.70±2.06	0.38	0.798ns	2.0±1.41
6 months (6)	15.83±3.06	-0.25	0.206ns	2.0±1.41
7 months (6)	12.83±3.37	1.33	0.317ns	2a
8 months (5)	14.20±4.92	-0.33	0.317ns	1a
9 months (6)	9.50±6.22	6.33	0.407ns	-
10 months (3)	10.33±4.04	1.50	0.205ns	-
11 months (3)	10.33±3.06	-0.50	0.500ns	-
12 months (4)	16.75±6.65	-6.50	0.144ns	1a

*Highly significant at α=0.05; ns = not significant

a = only one qualified success for the follow-up period, SD was not computed

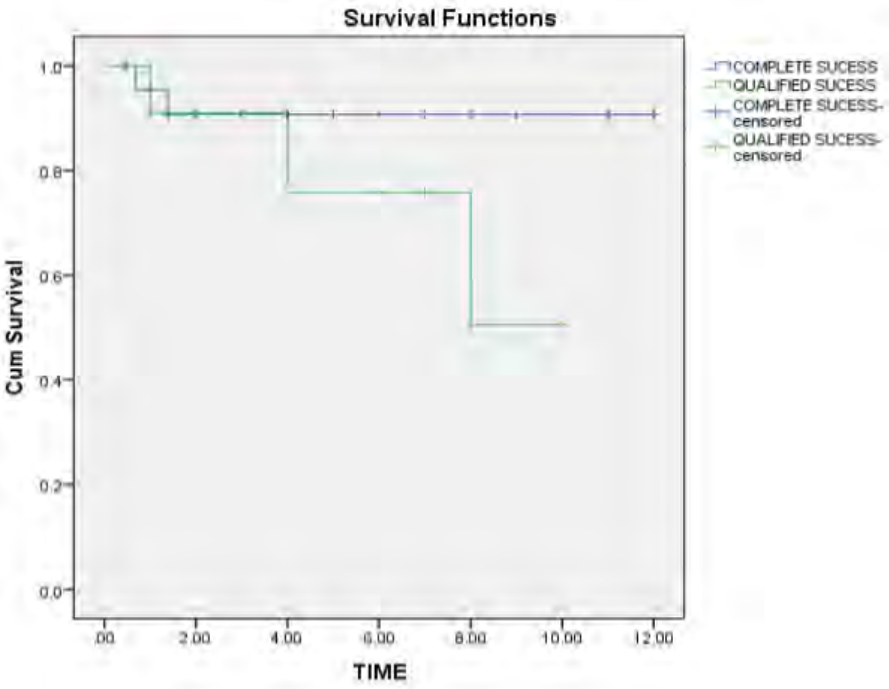

Figure 1. Kaplan-Meir for Complete and Qualified Success

THE DIAGNOSTIC ACCURACY OF BRUCH'S MEMBRANE OPENING-MINIMUM RIM WIDTH IN THE DIAGNOSIS OF GLAUCOMA: A META-ANALYSIS

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Introduction

Detecting specific optic nerve damage and visual field defects is paramount in glaucoma diagnosis. Optical coherence tomography (OCT) has expanded the diagnostic landscape, although its sensitivity and specificity in glaucoma suspects were questioned. Anatomic variations have also complicated OCT's diagnostic accuracy. Addressing these, Reis et al. introduced Bruch's membrane opening-minimum rim width (BMO-MRW), an OCT-derived diagnostics grounded in anatomy. This heightened accuracy, as it eliminates dependence on arbitrary reference planes used to differentiate the optic rim and cup. This study aimed to determine the accuracy of BMO-MRW in diagnosing glaucoma in adults compared to the current reference standard, retinal nerve fibre layer thickness (RNFLT).

Methods

Meta-analysis.

Results

The study found that BMO-MRW (0.940, 0.916 to 0.964) is diagnostically non-inferior to RNFLT(0.922, 0.892 to 0.952), and in the nasal (BMO-MRW: 0.869, 0.820 to 0.917 vs RNFLT 0.792, 0.733 to 0.851) and superotemporal sectors (BMO-MRW: 0.905- 0.866 to 0.944 vs RNFLT: 0.845, 0.794 to 0.897), it shows higher accuracy in terms of AUROC compared to RNFLT. The advantage of BMO-MRW is attributed to the anatomic relation of Bruch's membrane opening to the internal limiting membrane, which is independent of arbitrary reference planes that differentiate the optic rim and cup. This gives BMO-based parameters a consistent basis of measurement, which is less susceptible to variability. BMO-MRW was found to be the most consistent.

Conclusion

This study provides evidence for the diagnostic accuracy of BMO-MRW in glaucoma and highlights its potential as a diagnostic tool in clinical practice.

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COMPARING TOPICAL GLAUCOMA TREATMENT AND SELECTIVE LASER TRABECULOPLASTY AS ADJUNCT IN THE MANAGEMENT OF OPEN ANGLE GLAUCOMA IN A TERTIARY GOVERNMENT HOSPITAL: COST MINIMIZATION ANALYSIS

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Introduction

This study aims to determine cost reduction of selective laser trabeculoplasty (SLT) as adjunctive therapy for medically controlled open-angle glaucoma (OAG) in a tertiary government hospital setting.

Methods

This is a cost minimisation analysis determining SLT cost savings versus topical eye drops in a live cohort of medical controlled OAG patients who underwent SLT as adjunctive therapy from 2018-2022 at the glaucoma service clinic of a tertiary government hospital, using hospital-based chart review and using actual costs of treatment and medications.

Results

Forty-two (42) patients were included in the study. The annual cost savings observed were at 22.7% (Php 22,938.8 pre-SLT vs. Php 17,734.8 7-12 months post-SLT). These savings stem primarily from the reduced dependency on topical medications, which is further amplified by government subsidies and senior discounts. These can lead to substantial reductions in patients' out-of-pocket expenses. In addition, PHIC subsidies for the SLT procedure greatly reduces costs incurred by the cohort. There is a reduction of costs across all market price scenarios when PHIC coverage is applied. The average medication cost at the lowest market prices drops from Php 12,975.8 pre-SLT to Php 9,171.8 post-SLT. At the highest market prices, this average reduces from Php 14,735.1 pre-SLT to Php 10,441.8 post-

SLT. For senior citizens, the cost dynamics shift mostly in the low market price segment, the average cost decreases from Php 8,960.5 pre-SLT to Php 6,165.2 post-SLT.

Conclusion

SLT as an adjunctive therapy in OAG offers significant annual cost savings in the context of the public healthcare system in the Philippines. The economic advantages are fueled by a consistent reduction of medication burden and PHIC coverage. SLT can be recommended as adjunctive therapy for OAG patients in tertiary government hospitals with active PHIC coverage.

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TELESCOPING THROUGH TUNNEL VISION: A CASE REPORT ON THE ROLE OF LOW VISION IN STEROID-INDUCED GLAUCOMA IN A 25-YEAR-OLD FILIPINA WITH JUVENILE RHEUMATOID ARTHRITIS

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Introduction

Glaucoma is the leading cause of irreversible blindness. The affectation of visual field in glaucoma can greatly impair a patient's activities of daily living. Low vision services play a significant role in maintaining functionality and quality of life in glaucoma patients.

Methods

This study is a case report.

Results

This is a case of a 25-year-old Filipina diagnosed with juvenile rheumatoid arthritis who developed steroid-induced glaucoma of both eyes. After 9 years of management, patient was referred to low vision. The goals of the patient were to have better navigation, to enjoy travelling, and to find an occupation.

On physical examination, visual activity of light perception on the right and 20/231 using the ETDRS chart at 1 meter on the left. The patient had near vision of 1.6 M print using the near HOTV chart and a contrast sensitivity of 14/25. Visual field showed tunnel-vision with temporal field defect on the left eye.

Low vision devices were prescribed according to the patient's needs. A telescope helped the patient see far objects while the tunnel vision was addressed by reversing the position of the telescope widening the field of vision.

For near vision, mobile applications that read and identify objects were recommended (SeeingAI and SuperVision). The handheld magnifier maximized near vision to newspaper print.

The patient was referred to Resources of the Blind for the use of a walking cane as well as to ATRIEVE, a training facility that helps the blind develop occupational skills using computers.

Conclusion

Despite a narrow view, the low vision clinic widened all opportunities for the patient to maximize functionality. The clinic met her goals and inspired her to live life despite her disability. Early referral to low vision will play a significant role in restoring function in patients with glaucoma.

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Figures

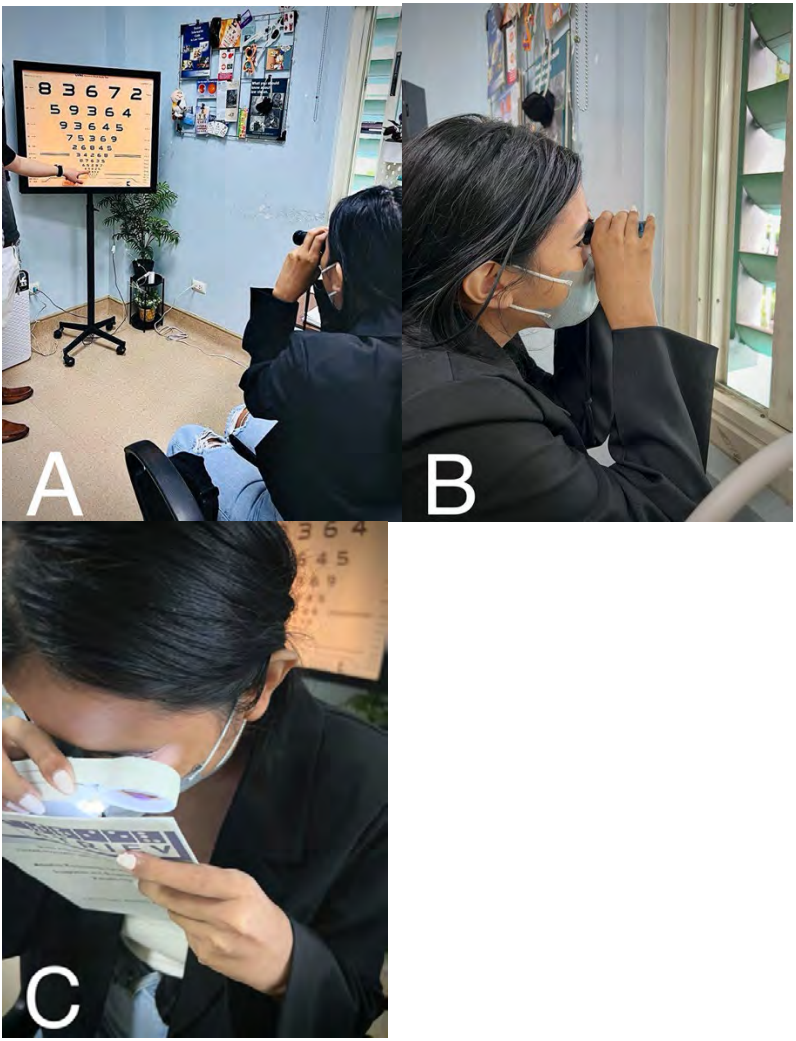

Figure 1. (A) Telescope used for far vision. (B) Reverse telescope for widened vision. (C) Handheld magnifier.

MACULAR AND PERIPAPILLARY PERFUSION DENSITY, FLUX INDEX AND VESSEL DENSITY OF GLAUCOMA PATIENTS IN A TERTIARY PHILIPPINE HOSPITAL

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Introduction

This study measured papillary and macular vascular network, papillary retinal nerve fibre layer (pRNFL) and macular ganglion cell complex (mGCC) thickness among Filipino glaucoma patients.

Methods

This was a single-centre, single-observer, cross-sectional, prospective study of Filipino patients with primary glaucoma. Two arms were compared: Healthy Group and Glaucoma Group. Optical coherence tomography angiography (OCTA) parameters including papillary perfusion density (pPD), papillary flux index (pFI), macular perfusion density (mPD) and macular vessel density (mVD) were taken and analyzed. Comparison with optical coherence tomography (OCT) parameters, including pRNFL and mGCC, thickness was done. Area under the receiver operating characteristic curve (AUC) was utilized.

Results

Healthy Group included 68 eyes of 39 patients, while Glaucoma Group included 35 eyes of 24 patients. The average pPD, pFI, mPD and mVD were all lower in glaucomatous eyes (40.17 ± .37%, 0.358 ± 0.034, 39.40 ± 3.78% and 20.97 ± 2.29 mm/mm^2, respectively) compared with healthy eyes (45.77 ± 1.37%, 0.455 ± 0.035, 42.23 ± 1.73% and 23.16 ± 2.72 mm/mm^2, respectively) ($p < 0.001$, 95% CI). The OCTA parameters at the peripapillary region are strongly related to the pRNFL - Pearson Correlation at 0.810 for pPD, 0.822 for pFI. The highest ability to detect glaucoma is

still the average pRNFL (0.986) followed by the average mGCC (0.982), pFI (0.967) and pPD (0.930). The AUC for average mPD and average MVD were only fair at 0.796 and 0.795, respectively. A lower average pPD ($p < 0.001$, 95% CI) and pFI ($p = 0.01$, 95% CI) was also detected in severe glaucoma (48.56 ± 2.75% and 0.341 ± .022, respectively) compared with mild glaucoma (42.82 ± 3.10% and 0.381 ± 0.038, respectively).

Conclusion

Papillary and macular vasculature, as determined by OCTA parameters, are decreased in glaucomatous eyes. Papillary OCTA parameters—perfusion density and flux index—have good potential in the detection of glaucoma.

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A PROSPECTIVE OBSERVATIONAL STUDY ON GLAUCOMA KNOWLEDGE, PATIENT ADHERENCE, AND COMPLIANCE TO THERAPY TO KNOWN GLAUCOMA PATIENTS IN A TERTIARY GOVERNMENT HOSPITAL: AN OVERVIEW

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Introduction

This study investigated glaucoma knowledge, patient adherence, and compliance to therapy to known glaucoma patients in Quirino Memorial Medical Center by using the Filipino-translated 27-statement version of the Glaucoma Treatment Compliance Assessment Tool (GTCAT).

Methods

The 27-statement version of the Glaucoma Treatment Compliance Assessment Tool (GTCAT) was translated in Filipino and underwent the process of forward and back translation and pilot testing prior to employment in the study. Inferential statistics using student t-test was applied in the analysis of the results.

Results

A total of 73 participants were recruited in the study. Different variables and external factors were examined and compared using student t-test wherein values of $p < 0.05$ were noted to be of significance. The study found that patients who finished tertiary education have a better understanding of their condition compared to those who finished secondary education. It also showed that most patients reported experiencing side effects from using the eyedrops and these reports were mostly from employed and retired patients than from unemployed patients. Patients who were diagnosed earlier reported that they will go blind if they will not use their eye drops. Patients with advanced and end-stage glaucoma were more compliant in using and in bringing their eyedrops as compared to patients with early-moderate glaucoma who were less compliant. Lastly, patients with glaucoma of low severity

highly believe that their knowledge is excellent, and that they do not have visual impairment from glaucoma.

Conclusion

Several factors affect patient compliance and adherence to therapy. Knowledge and barriers, such as side effects of medications and their perceived susceptibility in the progression of glaucoma, are important facets that can help guide physician to be better advocates for their patients. Physician-patient interaction can address these factors and ensure that patients become well-informed about their disease.

VISUAL OUTCOMES OF PHACOMORPHIC GLAUCOMA IN FILIPINO ADULTS: A SINGLE-CENTER RETROSPECTIVE REVIEW

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Introduction

Given the persistence of phacomorphic glaucoma cases in the Philippines, this study aims to determine the visual outcomes of this condition.

Methods

This is a single-centre retrospective medical chart review of patients who have been surgically managed as a case of phacomorphic glaucoma at the Department of Ophthalmology and Visual Sciences of the Philippine General Hospital. Included in the study are 30 adult patients presenting with phacomorphic glaucoma who have completed at least 3 months of follow-up.

Results

Of the 30 patients, majority were older than 60 years old and were female. Painless blurring of vision was the primary complaint of patients, with prolonged consult delay of 11.4 months (mean). Poor vision with mean of 2.6 logMAR (equivalent to hand movement), elevated IOP with mean of 45.8 mmHg and significant cataract were noted at presentation. Lens extraction was the procedure of choice for this condition, but some cases necessitated goniosynechiolysis, trabeculectomy or vitrectomy. Complications were noted postoperatively: 20% with prolonged corneal oedema, 10% with corneal decompensation. At the end of the 3-month follow-up, majority were off medications (90%) and had IOP of ≤21 mmHg (86.7%) but 30% still had visual acuity of 1 logMAR or worse and majority had structural changes with cup-disc ratio of 0.5 or worse (73.3%). Best visual outcomes were noted in those presenting less than 2 weeks from onset of symptoms and those without corneal nor posterior pole complications.

Conclusion

Phacomorphic glaucoma may present as a chronic insidious painless blurring of vision and may lead to prolonged delay to consult. While surgical intervention is effective in improving the IOP of these patients, poor visual outcomes are increased in the setting of increased consult delay as well as complications that may arise in managing this condition.

GGT1 SUPPRESSES THE DEVELOPMENT OF FERROPTOSIS AND AUTOPHAGY IN MOUSE RETINAL GANGLION CELL THROUGH TARGETING GCLC

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Background

Glaucoma is a neurodegenerative disorder characterized with optic nerve injury and the loss of retinal ganglion cells (RGCs). Ferroptosis has been proved to be associated with the degradation of RGCs. The aim of this study is to elucidate the relationship between ferroptosis and glaucoma pathogenesis, and unveil the underlying mechanism.

Methods

Methyl thiazolyl tetrazolium **(**MTT) assay was used to evaluate the proliferation of RGCs. The accumulation of cellular iron was measured by Iron assay kit, and the level of reactive oxygen species (ROS) was detected by fluorescence probe. The mitochondrial morphology and autophagosomes were analysed by using transmission electron microscopy (TEM). The contents of glutathione (GSH) and malondialdehyde (MDA) were tested by a GSH assay kit and an MDA detection kit, respectively. The expression of autophagy-related proteins was detected by Western blotting.

Results

A serious cell damage, aberrant iron homeostasis, and oxidative stress was shown in RGC-5 after oxygen-glucose deprivation/reoxygenation (OGD/R) treatment and gamma-Glutamyl transpeptidase 1 (GGT1) knockdown, but these effects were significantly alleviated by overexpression of GGT1 or ferroptosis inhibitors. The TEM and immunofluorescent results indicated that mitochondria impairment and autophagosome accumulation in OGD/R-treated cells was improved after GGT1 overexpression, while the phenomenon in GGT1-silenced cells was aggravated.

Furthermore, we found that GGT1 can interact with glutamate cysteine ligase catalytic subunit (GCLC) to inhibit autophagy and ferroptosis in RGC-5 cells.

Conclusion

GGT1 represses autophagy in RGC-5 cells by targeting GCLC, which further restrains the development of ferroptosis in cells.

EFFICIENCY AND SAFETY ASSESSMENT OF MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION (MP-TSCPC) FOR ADVANCED UNCONTROLLED GLAUCOMA

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Introduction

MicroPulse transscleral cyclophotocoagulation (MP-TSCPC) emerges as a promising therapeutic approach for challenging cases of advanced glaucoma. This article aims to assess the efficiency and safety of MP-TSCPC treatment for advanced uncontrolled glaucoma cases.

Methods

21 eyes with advanced uncontrolled glaucoma, and they received the Iridex Cyclo G6 device using a standardized protocol. Patients were followed up for a period of one year Observation points are day 1, week 1, month 1, month 3, month 6, month 9, and year 1 after treatment. The primary outcome the decrease of intra-ocular pressure (IOP) with a threshold of 20% reduction. The secondary outcomes are a reduction in the discontinuation of oral acetazolamide.

Results

There was significant IOP reduction at every observation point with a mean preoperative IOP of 12.19 mmHg and mean IOP at final follow-up was 11.50 mmHg. At least 50% of patients reached the significant threshold of 20% IOP reduction at every observation point except for month 6 follow-up. There was a statistically significant difference in the discontinuation of oral acetazolamide between the preoperative and postoperative group.

Conclusion

We concluded TSCPC as a safe and effective treatment for glaucoma management.

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OUTCOMES AND SAFETY OF THE PAUL GLAUCOMA IMPLANT IN EYES WITH REFRACTORY GLAUCOMA

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Introduction

The PAUL® Glaucoma Implant (PGI) is an innovative glaucoma drainage device designed to minimise postoperative complications compared to existing shunts. This study seeks to evaluate the long-term efficacy of the PGI among individuals diagnosed with advanced glaucoma.

Methods

We conducted a retrospective review of all patients who underwent PGI implantation at a single hospital between January 1, 2022, and January 1, 2024. The primary outcome was considered a failure if the intraocular pressure (IOP) exceeded 21 mmHg or showed less than a 20% reduction from the preoperative baseline. Persistent late hypotony, defined as an IOP below 6 mmHg on 2 consecutive visits after 3 months, was also indicative of failure. Additional criteria included additional glaucoma surgery, explanation of the implant, or loss of light perception vision. Complete success was defined as achieving an unmediated IOP of ≤ 21 mm Hg or ≥ 6 mmHg without meeting failure criteria.

Results

Five eyes were identified, with mean follow-up duration of 12.9 ± 2.0 months. Four patients (80%) had primary glaucoma and 1 (20%) with previous glaucoma surgery. At 1 year following surgery, 1 eye (20%) fulfilled the failure criteria with 4 eyes (80 %) achieving complete success. Compared with mean medicated preoperative IOP (20.4 ± 4.1 mmHg), postoperative IOP at 12 months was 13.4 ± 1.8 (P = 0.01). Mean number of medications decreased from 3.1 ± 0.4 preoperatively to 0.4 ± 0.35 at 12 months (P = 0.01). No significant complications occurred.

Conclusion

The PGI demonstrated sustained IOP reduction and a decrease in medication usage post-surgery in patients with advanced glaucoma compared to other currently available implants.

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MACULAR AND RETINAL NERVE FIBRE LAYER THICKNESS IN MYOPIC EYES OF MALAY POPULATION

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Introduction

The incidence of myopia keeps increasing, which leads to the risk for many eye diseases. The routine myopia assessment will not reveal changes in the retina thus investigation of its pathophysiology is becoming more important. The study aims to determine the correlation between macular thickness and retinal nerve fibre layers (RNFL) in myopic subjects of the Malay adult population in Malaysia.

Methods

A total of 41 subjects aged between 18 years to 39 years old who attended the eye examinations at MSU Eye Centre were recruited for the study. The parameters investigated include macular thickness, RNFL thickness, axial length, and degree of myopia. The axial length was measured by using the ZEISS IOLMaster 700, and the retinal layer and the macula thickness were measured using ZEISS Cirrus HD-OCT 5000.

Results

The mean age of the participants was 26.98 ± 5.37. For the low, moderate, and high myope, the mean axial length was 24.19 mm, 25.65 mm, and 26.33 mm and RNFL thickness was 94.92 ± 8.90 mm and 95.95 ± 18.54 mm, and macular thickness was 278.73 mm; 279.24 mm; 271.75 mm and 277.48 mm, respectively. There was a significant difference between the axial length of myopia and the control group ($p < 0.01$) and RNFL and macular thickness were thinner in eyes with moderate to high myopia than in normal eyes ($p < 0.01$).

Conclusion

Significant RNFL and macular thinning were observed in high myopes, suggesting that retinal assessment is needed for patients with high myopia for early detection of glaucoma and optic nerve eye disease.

ONE-YEAR EXPERIENCE WITH LATANOPROSTENE BUNOD OPHTHALMIC SOLUTION 0.024% IN CLINICAL PRACTICE: A RETROSPECTIVE OBSERVATIONAL STUDY

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Introduction

We evaluated the intraocular pressure (IOP)-lowering efficacy of latanoprostene bunod (LBN) ophthalmic solution 0.024% (Vyzulta®).

Methods

This is a retrospective observational study. Data of patients aged 18 years and older who received LBN from July 2021 to May 2023 were extracted from medical records. All included patients received LBN as a replacement for a PGA, with 1-, 3- , 6- and 12-month follow-up. Main outcome measures were IOP, retinal nerve fibre layer thickness, visual fields before/after LBN use, and adverse effects. Subgroup analysis with glaucoma types and PGA use were performed for additional IOP reduction after LBN use.

Results

Among 78 included patients, 47 patients (81 eyes), 60 % with open-angle glaucoma (OAG) remained on LBN throughout 12-month follow-up. Baseline IOP was 18.2 ± 4.2 mmHg, and IOP before LBN was 14.4 ± 3.0 mm Hg (21 % mean IOP reduction). Mean additional IOP reduction was 1.0 mm Hg at month 1, and the greatest reduction was 1.6 mmHg (11% additional mean IOP reduction) at month 12 ($P < 0.0001$). Subgroup analysis showed mean additional IOP reduction at month 12 was 1.3 mm Hg in NTG group (73%) and 2.1 mmHg in POAG group (9.6% vs.12.7%, $P = 0.23$). Subgroup analysis of PGA use at month 12 was 1.8 mm Hg in tafluoprost group and 0.5 mm Hg in travoprost group (12% vs. 3.3%, $P = 0.02$). Ocular adverse effects included irritation (19.8%), mild conjunctival hyperaemia (13.6%), dark circles (4.9%) and

blurred vision (2.5%). No significant changes in visual field and retinal nerve fibre layer thickness after 12 months follow up.

Conclusion

During 12 months of clinical use of LBN, patients exhibited statistically significant reductions in IOP in the replacement of other PGAs as well as benefits in the visual field and retinal nerve fibre layer thickness preservation.

ANTERIOR CHAMBER ANGLE WIDENING BY AIR INJECTION UPON PHACOEMULSIFICATION AND GONIOSYNECHIALYSIS: A RANDOMISED CONTROLLED TRIAL STUDY

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Introduction

To investigate the anatomical changes of anterior chamber in patients with acute primary angle closure (APAC) or primary angle-closure glaucoma (PACG) who received phacoemulsification and goniosynechialysis (Phaco-GSL) with or without anterior chamber air injection.

Methods

This prospective, randomised, controlled trial study included 39 eyes diagnosed with APAC or PACG. Nineteen eyes were randomly allocated to receive air injection upon Phaco-GSL, and 20 eyes to receive Phaco-GSL only. The anterior segment parameters and intraocular pressure (IOP) before and after surgery were measured and compared.

Results

The APAC or PACG conditions were significantly improved in both groups after surgery ($P < 0.05$). At one day after surgery, the changes of angle opening distance and trabecular-iris space area at 750 μm from the scleral spur were significantly higher in the patients with additional air injection than those without air injection ($P < 0.05$) and lasted for 1 month at the temporal angle. The differences in the changes of iris-trabecular contact degree between the 2 groups after surgery were predominant at 2 months after surgery (166.63o ± 96.84o vs 102.55o ± 69.27o, $P = 0.041$). At the last visit, the IOP decreased by 8.81 ± 8.10 mmHg in the air injection group and 3.56 ± 6.81 mmHg in the Phaco-GSL only group ($P = 0.034$).

Conclusion

Air injection upon Phaco-GSL can increase the width of the anterior chamber angle and provide additional IOP lowering. Air injection can be considered as an adjuvant treatment for APAC and PACG upon Phaco-GSL.

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RARE ASSOCIATION OF INHERITED RETINAL DYSTROPHIES AND REFRACTORY ANGLE CLOSURE GLAUCOMA: MANAGEMENT CHALLENGES AND NEW LEARNINGS

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Introduction

This study explores the unique phenotype, diagnosis, and management challenges posed by inherited retinal dystrophies (IRDs) coexisting with refractory angle closure glaucoma (ACG), prone to malignant glaucoma (MG) post-intervention.

Methods

A case series of 18 young patients (35 eyes) diagnosed with IRDs and ACG is presented. The cohort encompassed cases of autosomal recessive/dominant bestrophinopathy (14 subjects), retinitis pigmentosa (RP) (2 subjects), Enhanced S cone syndrome (1 subject), and X-linked retinoschisis (XLRS) (1 subject). Standard guidelines, coupled with ancillary imaging and electrophysiological evaluations, genetic testing was employed for the phenotypical and genotypical diagnosis of IRDs and ACG. Analysis focused on the postoperative complication of MG in these eyes.

Results

The median age at presentation was 31.7 ± 10 years, with 10 males and 8 females. Glaucoma surgery in 16 eyes led to refractory MG. Resolution strategies, such as pars plana vitrectomy (PPV) and irido-zonulo-hyaloido-vitrectomy (IZHV), were applied, with variations based on lens status. Eyes undergoing vitrectomy with postero-anterior communication, either alone or combined with lens or glaucoma surgery, did not develop MG. Comprehensive data on refractive error, axial length, intraocular pressure (IOP), and genetic testing results are presented, providing insights into the complexity of these cases.

Conclusion

Bestrophinopathy emerged as the most common IRD associated with refractory ACG. Conventional glaucoma surgery consistently led to MG, necessitating vitrectomy with postero-anterior communication for resolution. Notably, when vitrectomy with postero-anterior communication was performed alone or alongside glaucoma/cataract surgery, it not only prevented MG but also resulted in well-controlled IOP and a deep anterior chamber. These findings highlight the secondary nature of angle closure in IRD eyes, underscoring the potential efficacy of addressing the vitreous over traditional glaucoma surgery.

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PERFORMANCE OF AN AUTOMATED, OFFLINE ARTIFICIAL INTELLIGENCE TOOL ON A SMARTPHONE-BASED FUNDUS CAMERA IN SCREENING VARIOUS STAGES OF GLAUCOMA SEVERITY

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Introduction and Aim

To report the performance of an artificial intelligence (AI) system deployed on a smartphone-based fundus camera to detect referable glaucoma of different severity grades when compared with the diagnosis made by glaucoma specialist.

Methods

Prospective cross-sectional study at a tertiary eye institute. One disc-centred image per eye was captured using the validated, portable non-mydriatic fundus camera. The diagnostic ability of the AI tool to detect referable glaucoma based on only disc photos was compared against a diagnosis made by a glaucoma specialist using clinical and diagnostic test information of OCT and visual field data. The severity of glaucoma was classified based on the visual field mean deviation using Hodapp–Parrish–Anderson criteria.

Results

We included 213 participants with a mean age of 55 ± 14.7 years (18 to 88 years). The glaucoma specialist diagnosed 129 subjects as-confirmed glaucoma, 33 as-disc suspects and 51 as-no glaucoma. At a patient level (worse eye diagnosis), the automated AI system with fundus images alone achieved an accuracy of 92.02%, sensitivity of 91.36% (95% CI 85.93% to 95.19%), specificity of 94.12% (83.76% to 98.77%) for referable glaucoma. The sensitivity of AI for detecting mild (out of 23-milds, 13 as glaucoma, 7 as disc suspects), moderate (out of 31 moderates, 22 as glaucoma, 6 as disc suspects), and advanced glaucoma (out of 75 advanced cases, 71 as glaucoma and 1 as disc suspect) on fundus images alone when compared to a

specialist who conducted a full glaucoma work-up was 86.9% (95% CI 66.4–97.2), 90.3% (95% CI 74.3–97.96), and 96% (88.75% to 99.17%) respectively.

Conclusions

The AI-based offline tool integrated on a smartphone fundus camera showed a promising performance in detecting referable glaucoma compared to a glaucoma specialist's diagnosis following a comprehensive glaucoma workup. The AI showed better accuracy in detecting advanced glaucoma followed by moderate and early glaucoma.

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SCREENING CHILDHOOD GLAUCOMA WITH AN AUTOMATED, OFFLINE, ARTIFICIAL INTELLIGENCE ALGORITHM DEPLOYED ON A SMARTPHONE-BASED FUNDUS CAMERA–PILOT STUDY

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Introduction and Aim

Childhood glaucoma, constituting 5% of paediatric blindness, affects over 300,000 children globally, and early diagnosis is crucial for successful treatment. This pilot study assessed the diagnostic capacity of an AI-driven glaucoma screening tool for the detection of childhood glaucoma using images captured by a smartphone-based fundus camera.

Methods

Participants aged 5 to 18 years, visiting a tertiary eye hospital's glaucoma clinic, had one disc-centred image per eye captured using a validated, portable non-mydriatic fundus camera. The study evaluated the AI tool's photo documentation ability and diagnostic accuracy in detecting referable glaucoma (including glaucoma and disc suspects). The AI system's performance was compared against a specialist's final diagnosis following a comprehensive glaucoma work-up. Childhood glaucoma was classified as either primary glaucoma (including primary congenital glaucoma/PCG and juvenile open-angle glaucoma) or secondary glaucoma (resulting from conditions like cataract surgery, syndromes, or other acquired factors).

Results

In the study of 33 eyes from 17 children, with a mean age of 12 ± 3.4 years, 64% of the eyes displayed some form of childhood glaucoma. The AI system correctly identified all 12 eyes without glaucoma. Among those diagnosed with childhood glaucoma (21 eyes), the AI system identified 38% as referable glaucoma (5 PCG with structural change and 3 secondary) and 10% as glaucoma suspects (secondary).

However, it failed to detect referable glaucoma in 52% of cases, primarily in those with no apparent optic disc changes (PCG or secondary glaucoma with healthy neuroretinal rim).

Conclusion

These preliminary results suggest that the integration of AI into a portable fundus camera shows potential as a screening tool for childhood glaucoma, particularly in cases with observable optic disc changes. The device's portability, ease of use, photo documentation capabilities, and affordability make it a valuable tool for both clinical and population-level screening of glaucoma in children.

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MACULAR VESSEL DENSITY CHANGES AFTER TRABECULECTOMY IN GLAUCOMA

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Purpose

To retrospectively investigate the effects of trabeculectomy (TLE) on macular perfusion density (MPD).

Methods

This study included 33 patients with primary open-angle glaucoma (POAG) who underwent TLE at Gifu University Eye Hospital between October 2019 and September 2022. Thirty-three eyes were studied in 33 patients (mean age, 65.4 years; 12 males, 21 females; mean MD value, -17.9 dB; mean spherical equivalent, -2.41 D). Angio Retina Scan 6 x 6 mm using OCT angiography (Cirrus 5000 HD-OCT Angio plex) was performed at baseline, 1 month, and 3 months after surgery. The macular surface vascular density was analysed using Angio Plex Metrix for the entire macula and all 8 sectors to compare the changes before and after surgery.

Results

The mean intraocular pressure (mmHg) significantly decreased from 17.8 to 8.6 at 1 month and 10.7 at 3 months after surgery ($p < 0.0001$). MPD (%) increased from 30.4 at baseline to 34.5 ($p < 0.05$) at 1 month after surgery. A comparison of MVPD between baseline and 1 month after surgery for each macular sector revealed significant increases in the superior nasal quadrant from 29.9 to 33.8, in the inferior nasal quadrant from 28.3 to 33.1, in the inferior temporal quadrant from 32.1 to 37.1, in the superior temporal quadrant from 33.4 to 38.5, and in the inferior nasal quadrant from 34.1 to 38.7 ($p < 0.05$). There was no significant difference in any of these measures between baseline and 3 months after surgery.

Conclusion

MPD significantly increased at 1 month after surgery, and a similar trend was observed in the analysis of each macular sector. The decrease in intraocular pressure after surgery may play a role in the temporary increase in MPD.

RED-FREE (GREEN) FILTER-ENHANCED GONIOSCOPY WITH SMARTPHONE: A PILOT STUDY

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Introduction

This pilot study aimed to demonstrate the usefulness of the red-free (green) filter as a novel modification for better iridocorneal angle visibility during routine gonioscopy.

Methods

As a pilot project, we observed 20 eyes of 10 patients aged 22 to 60 who attended the glaucoma department of a tertiary eye hospital in Bangladesh. All patients underwent a thorough ocular examination, from best-corrected visual acuity to the dilated fundus evaluation. Images and videos were obtained with a smartphone during gonioscopy with standard halogen light and the red-free (green) filter, subjectively analysed by 2 glaucoma specialists.

Results

The mean age of the patients was 37 ± 13.42 years, of whom 70% were men. In this study, 40% of the patients had open-angle glaucoma, and 60% had open angle without glaucoma. Without impairing the ability to see the iridocorneal angle structures in detail, the gonioscopy picture contrast was enhanced objectively for red-free filter images compared to standard light photos. The built-in warm filter of the slit-lamp also provided better visualization of the iridocorneal angle structures.

Conclusion

Using the red-free (green) filter and a warm filter instead of the traditionally used standard light of the slit lamp may significantly enhance the diagnostic capability during routine gonioscopy.

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EARLY EXPERIENCE WITH AB INTERNO VISCODILATION AND TRABECULOTOMY WITH OMNI SURGICAL SYSTEM IN MODERATE TO SEVERE GLAUCOMA COMBINED WITH CATARACT SURGERY: A RETROSPECTIVE STUDY

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Patients and Methods

Study outcomes of combined ab-interno viscodilation and trabeculotomy with OMNI surgical system with cataract surgery in 20 eyes with moderate to severe open-angle glaucoma between August 2022 and December 2022 by a single surgeon (DM). The charts were assessed for mean preoperative and postoperative IOP and mean number of medications preoperatively and postoperatively at 1 month and then every 3 months after that. The charts were also evaluated for adverse events and visual acuity preoperatively and 4 weeks post-procedure.

Observations

Twenty eyes with moderate to severe glaucoma (mean deviation -3.68 to -29.73 dB) underwent ab interno viscodilation and trabeculotomy procedure combined with phacoemulsification with intraocular lens implantation through a temporal approach. The mean preoperative IOP was 18.10 ± 5.51 mmHg. The mean number of medications was 2.89 (range 2-4) The mean postoperative IOP at 1 month was 12.75 ± 3.56 mmHg (mean reduction 29.55%), at 3 months was 13.23 ±3.40 mmHg (mean reduction 26.90%), at 6 months was 13.16 ± 2.70 mmHg (mean reduction 27.29%), at 9 months was 12.16 ± 1.32mmHg (mean reduction 32.81%), and at 12 months was 13.66 ±2.51 mmHg (mean reduction 24.50%). The mean number of medications reduced to zero at 3 months and 6 months. One eye needed single medication at 9 months. A little bleeding intraoperatively and some blood clots postoperatively were observed in almost all patients with 3 having frank layered hyphaema. None needed any intervention. The incidence of hyphaema was not

related to anticoagulant use. No significant vision-threatening complications were observed.

Limitations

Retrospective nature of the study, loss of data at 12 months, only 10 out of 20 patients.

Conclusion.

Ab interno viscodilation and trabeculotomy appear to be safe and effective in lowering the IOP and reducing medication load in open-angle glaucoma.

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EVALUATING THE EFFECT OF DORZOLAMIDE VS NETARSUDIL IN PREPERIMETRIC AND EARLY GLAUCOMA: A RANDOMISED CONTROLLED TRIAL

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Introduction

To compare the effect of dorzolamide and netarsudil on IOP, OCT and OCTA in preperimetric/early glaucoma patients.

Methods

A prospective RCT- 60 preperimetric/early glaucoma eyes were recruited. 30 eyes were prescribed E/D dorzolamide 2% TDS (Group 1) and 30 eyes were prescribed E/D netarsudil 0.02% OD (Group 2). The IOP, RNFL thickness, mGCL thickness, ONH perfusion pressure (PP), ONH flux index (FI), and macular vessel density (mVD) of the 2 groups was recorded at baseline, 4, and 8 months.

Results

Baseline IOP in Group 1 was 19 mmHg and in Group 2 was 18.5 mmHg (p = 0.99). At 8 months, IOP in Group 1 was 18 mmHg (p = 0.065) and in Group 2 was 17 mmHg (p = 0.0038); (p = 0.14). RNFL and mGCL did not show any significant change in both groups. Baseline mVD in Group 1 was 15.2 mm/mm^2 and in Group 2 was 14.6mm/mm2; (p= 0.22). At 8 months, mVD in Group1 was 14.8 mm/mm^2 (p = 0.65), in Group2 was 13.9mm/mm2; (p= 0.22). Baseline PP in Group 1 was 43.30%, in Group 2 was 43.45%; (p = 0.79). At 8 months, PP in Group 1 was 43.65% (p = 0.56), in Group 2 was 44.25% (p = 0.26). The difference in 2 groups was not statistically significant (p = 0.63). Baseline FI in Group 1 was 0.42, in Group 2 was 0.39; (p = 0.17). At 8 months, FI in Group 1 was 0.43; (p = 0.76), in Group 2 0.40 (p = 0.41). The difference in 2 groups was not statistically significant (p = 0.40).

Conclusion

Both groups showed a significant reduction in IOP over 8 months. The pRNFL and mGCL showed no significant change. mVD decreased whereas ONH perfusion and ONH flux index increased in both groups though the change was not significant.

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ASSOCIATION OF FOVEAL AVASCULAR ZONE AREA WITHSTRUCTURAL AND FUNCTIONAL PROGRESSION IN GLAUCOMA PATIENTS

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Introduction

To investigate whether quantitative optical coherence tomography angiography (OCTA) metrics of the superficial/deep macular retina and optic disc are associated with glaucoma progression risk.

Methods

A total of 238 eyes from 119 patients with open angle glaucoma or ocular hypertension, and no history of systemic hypertension or diabetes mellitus were included. All participants underwent OCTA imaging with a swept-source OCT (DRI-OCT 1, Topcon, Japan). OCTA metrics of superficial capillary plexus (SCP) and deep capillary plexus (DCP) in the macular region, and radial peripapillary capillary network of the optic disc were measured by a customised MATLAB program to obtain foveal avascular zone (FAZ) area, FAZ circularity and capillary density of SCP/DCP, and capillary density of the peripapillary region. Relationships between baseline OCTA metrics, visual field (VF) metrics, intraocular pressure fluctuation and risk of glaucoma progression were analysed with the Cox proportional hazards model. A frailty model was used to adjust for intereye correlation.

Results

During a mean follow-up duration of 29.39 months (range 12–56 months), 50, 48, and 16 eyes were determined to have retinal nerve fibre layer (RNFL), ganglion cell-inner plexiform layer (GC-IPL), and VF progression, respectively. FAZ area per SD increase at baseline were significantly associated with both RNFL thinning (HR 1.73 95% CI 1.04 to 2.90); p = 0.036) and GC-IPL thinning (HR 2.62, 95% CI 1.59 to 4.31; p <

0.001), after adjusting for age, axial length, and other potential confounding factors. VF progression was associated with age (HR 1.05, 95% CI 1.02 to 1.08; $p < 0.001$) and mean deviation value (HR 0.91, 95% CI 0.84 to 0.98; $p = 0.010$), but not with any OCTA metrics.

Conclusion

Enlarged FAZ area measured by OCTA was associated with a higher risk of RNFL and GC-IPL thinning associated with glaucoma, but not with functional deterioration in glaucoma.

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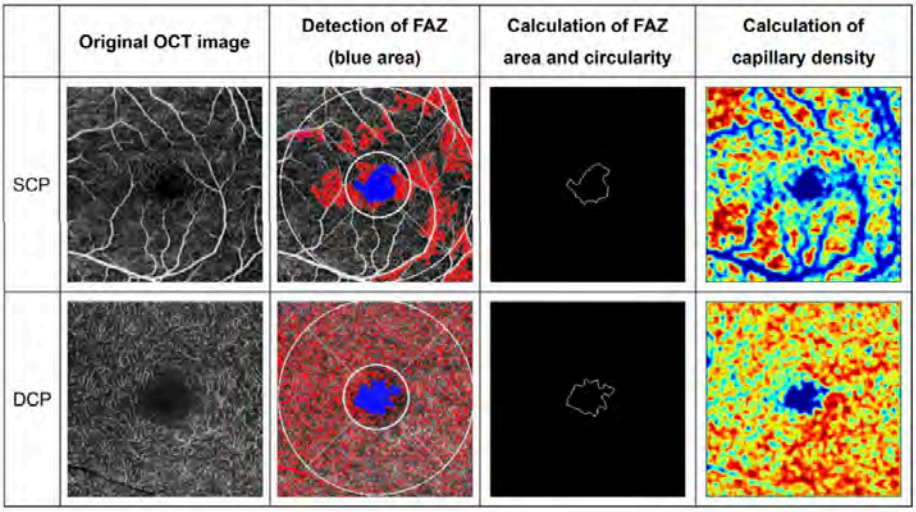
Tables, Figures, and Illustrations



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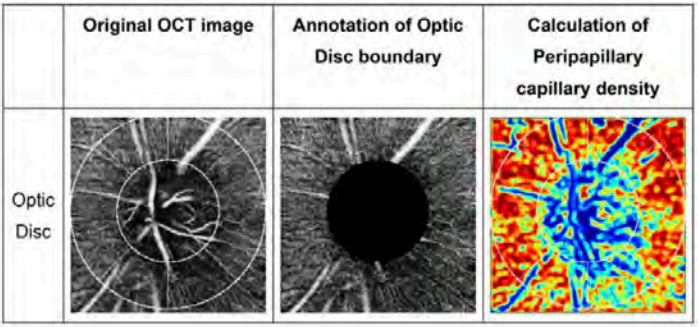

B

Figure 1. Diagram of automatic measurement of retinal microvasculature from OCT angiography images by the customized Matlab programme. (A) OCTA parameters of the SCP and DCP of the macular region. (B) OCTA parameters of the peripapillary region. DCP, deep capillary plexus; FAZ, foveal avascular zone; OCT, optical coherence tomography; OCTA, OCT angiography; SCP, superficial capillary plexus.

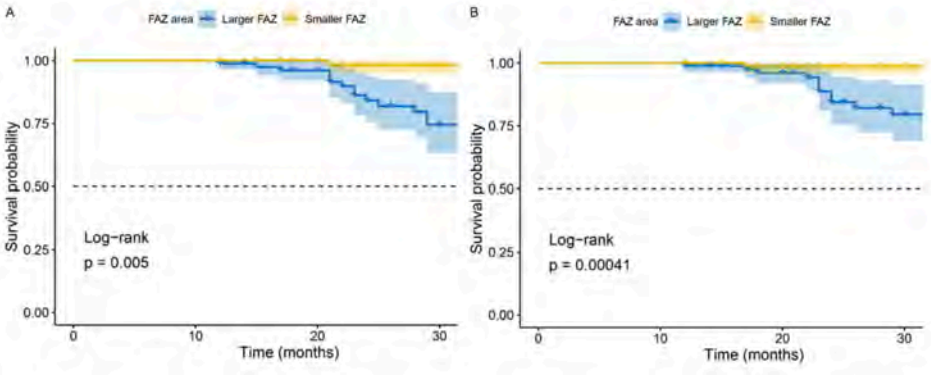

Figure 2. Cox regression analysis based on progressive RNFL (A) and GC-IPL (B) thinning. The plot shows the association of stratified FAZ area with risk of RNFL and GC-IPL thinning. Larger FAZ (FAZ area per SD increase ≥2.0) area is associated with a higher risk of RNFL and GC-IPL thinning. FAZ, foveal avascular zone; GC-IPL, ganglion cell-inner plexiform layer; RNFL, retinal nerve fibre layer.

THE WATER DRINKING TEST FOR GLAUCOMA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction

The water drinking test (WDT) is a provocation test which involves the ingestion of water followed by IOP measurements, thus presenting as an alternate method for IOP monitoring amongst patients with glaucoma. This systematic review and meta-analysis examines the relationship between intraocular pressure (IOP) parameters during the WDT and diurnal IOP monitoring, and evaluates the reproducibility of the WDT and its association with future glaucomatous visual field (VF) loss.

Methods

A literature search was performed on PubMed, EMBASE, and Cochrane Library from inception to 31 March 2023. Cohort, cross-sectional and observational studies reporting WDT results in glaucoma patients diagnosed by a trained professional were included. Meta analysis with random-effect model was performed using “metafor” package in R version 3.2.1.

Results

A total of 641 studies were identified on initial literature search. 38 studies (2,479 subjects) were included in final analysis. Meta-analytic estimates of 5 studies (310 subjects) found strong positive correlation in peak IOP between the WDT and diurnal IOP monitoring ($r = 0.92$, 95% CI = 0.75, 1.08, $p < 0.0001$). However, there was only weak positive correlation for IOP fluctuation between both methods ($r = 0.26$, 95% CI = 0.06, 0.47, $p < 0.0001$). Meta-analytic estimates of 3 studies (189 subjects)

suggested a trend of the diurnal peak IOP being lower than that derived from the WDT (MD = -2.37 mmHg, 95% Limit of Agreement (LOA) =-5.58, 0.84, p = 0.147). Two studies found that a higher WDT peak IOP was associated with greater future VF progression. Two studies demonstrated good reproducibility in peak IOP measurements for WDTs conducted across different days.

Conclusion

In glaucoma patients, there was a strong positive correlation between IOP peaks during the WDT and diurnal IOP monitoring. Peak IOP for the WDT demonstrated good reproducibility and may be associated with greater future VF progression.

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CAVERNOUS HEMANGIOMA AT THE ORBITAL APEX: A PSEUDO-GLAUCOMA

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Introduction

Cavernous haemangiomas are the most common benign orbital neoplasm in adults, commonly seen in middle-aged females. Progressive, painless proptosis is the common presentation. Typically, these lesions are encapsulated and isolated from the surrounding tissue making them easier to remove than other orbital tumors. We report a case of cavernous haemangioma at the orbital apex, which was initially managed as glaucoma.

Methods

Here is a case of a 48-year-old woman with a 4-year history of progressive, unilateral blurring of vision managed as a case of glaucoma. Progression of symptoms despite anti-glaucoma therapy, prompted transfer from one specialist to another. OCT was noted to be atypical of glaucoma, hence MRI was ordered, which revealed an enhancing soft tissue posterior orbital mass compressing the optic nerve. This prompted referral to Neurosurgery and Orbit service. Ocular examination revealed visual acuity of 20/100, proptosis, ptosis, ophthalmoplegia, RAPD, and optic nerve cupping on the left eye.

Results

Despite the mass being adherent to surrounding tissues, the lesion was excised en block through lateral orbitotomy with bone flap. The patient's visual acuity on the operated eye improved to 20/40 by postoperative day 5. Histopathology confirmed the diagnosis of cavernous haemangioma.

Conclusion

Management of orbital tumours requires collaborative effort from different medical disciplines. Meticulous history-taking and examination may be insufficient to correctly diagnose difficult cases of orbital disease. Orbital imaging correlated with clinical findings, surgical judgment, and expertise should allow us to define the most efficient management of orbital diseases to avoid the dreaded complication of blindness from compressive optic neuropathy.

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Tables, Figures, and Illustrations

Fig. 1. Pre-operative period & Immediate post-operative period with normal pupil size.

Fig. 2. Lobulated mass in the left posterior orbital space compressing and medially displacing the ipsilateral optic nerve.

OUTCOME OF THERMO-CYCLO LASER IN ADVANCED GLAUCOMA PATIENTS

Kabir M

Introduction

Intraocular pressure (IOP) is a significant primary risk factor and is the only modifiable risk factor in glaucoma patients for which treatment can be directed to slow or halt progression. Cyclodestruction is one of the last treatments to control IOP in advanced glaucoma patients. It has been performed by various methods, including diathermy, surgical excision, cryotherapy, ultrasound, and laser. The continuous-wave TCP diode laser emits laser energy at a wavelength of 810 nm. When directed at the ciliary processes, it causes ablation of the ciliary epithelium resulting in homogenous blanching and shrinking of the ciliary processes.

Methods

This interventional prospective study includes 20 patients of advanced glaucoma with no visual prognosis. Thermo-cyclo laser was done in 3 sessions according to reduction of intraocular pressure. After performing thermos-cyclo-laser, IOP was measured consecutively after 4 hours, 7 days and 1 month in first cycle. The second cycle starts right after 1 month in case of higher IOP measurement, and third cycle is applied after 1 month of second cycle for the same scenario.

Result

Among 20 cases we found IOP were decreased most of the cases. In 3 cases IOP was same and only one case there was increased IOP than previous. After the second IOP was within normal limit for session most of the cases (10 cases). The remaining 6 cases needed a third session and then IOP reduced to satisfactory level. The 3 cases that did not respond, were treated with other glaucoma protocol. After first session, pain was subsided in all of 20 patients.

Conclusion

Cyclodiode laser treatment very effectively eliminated discomfort in previously painful, blind, glaucomatous eyes. “Ideal” treatment parameters remain uncertain and protocols using slightly less total energy delivery to the ciliary body might have a lower risk of hypotony, although a corresponding increase in the need for retreatments might be expected.

EVALUATION OF INTRAOCULAR PRESSURE CHANGES IN PATIENTS AFTER TRABECULECTOMY WITH MITOMYCIN-C IN UNDAAN EYE HOSPITAL, INDONESIA: ONE-YEAR FOLLOW-UP

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Introduction

Trabeculectomy with mitomycin-C (MMC) is a widely utilized intervention for managing glaucoma. This study aimed to analyse the changes in intraocular pressure (IOP) before and after surgery with some statistical analysis variables IOP pre-operative and IOP post-operative.

Methods

An observational retrospective study was collected from the medical record of 65 eyes from 52 patients diagnosed with glaucoma post trabeculectomy with 2 mg/ml MMC from 2022 to 2023 at Undaan Eye Hospital Surabaya, Indonesia. The IOP outcomes were evaluated at 1 month, 2 months, 6 months, and 1 year, with statistical analyses revealing patterns in IOP changes.

Results

IOP comparison test between several follow-up times with Kruskal Wallis then continued with the Dunn test ($p < 0.001$), showed significant changes during preoperative compared to postoperative observation times ($p < 0.05$), while comparison of IOP between postoperative observation times showed no significant difference ($p > 0.05$). From the results of the correlation test for IOP categories (< 20 and ≥ 20) with each observation time between preoperative and postoperative, the value $r = -0.491$, $p < 0.001$. This means that the longer the observation time, there is a tendency to reduce the IOP category (< 20), compared to preoperative. From the results of the regression test, it can be seen that for every 1 month of observation, the IOP can be reduced by -1,141 units.

Conclusion

There was a significant change between IOP before and after surgery at each observation time, with a negative correlation. There is a trend for IOP to decrease compared to preoperative. These results provide valuable insights into the success of surgery on IOP, considering factors that influence the trabeculectomy for optimizing long-term success in glaucoma management.

SUCCESSFUL MANAGEMENT IN LATE HYPOTONY MACULOPATHY POST-TRABECULECTOMY WITH MITOMYCIN-C IN ONE SEEING EYE: A CASE REPORT

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Introduction

Trabeculectomy is a common surgical procedure for glaucoma. It can lead to complications such as hypotony maculopathy which can result in permanent visual loss.

Case illustration

A 62-year-old woman complained of blurred vision in her right eye for the past five months. On examination, the right eye was diagnosed as primary angle closure glaucoma with best corrected visual acuity (BCVA) of 3/10 and IOP was 50.6 mmHg, and the left eye was anophthalmic. The patient underwent a trabeculectomy with mitomycin-C. One month after surgery, the BCVA was 1/10 and the IOP was 11 mmHg. However, the patient still complained of blurred vision accompanied by watery eyes, with the IOP gradually decreasing to 3 mmHg 6 months post-operation. The seidel test result was negative, and the anterior chamber depth was moderate to deep. From optical coherence tomography (OCT) we found chorioretinal folds in the retinal layer. A bleb repair was then carried out.

Discussion

One of the causes of maculopathy hypotony is bleb overfiltration which is highly correlated with increased aqueous humour outflow. If not treated appropriately, as time goes by accompanied IOP continues to decrease, it can cause abnormal fundus formation which can reduce visual acuity. In this case, IOP before surgery was 3 mmHg which lasted for 4 months, and retinal fold results were found. Bleb repair surgery was performed, resulting in an increased IOP of 19.6 mmHg, improved vision with BCVA 7/10, and improved macular structure.

Conclusion

Bleb repair in hypotony maculopathy after trabeculectomy with mitomycin-C can prevent permanent loss of vision.

OUTCOME OF CHILDHOOD GLAUCOMA FOLLOWING CATARACT SURGERY IN CONGENITAL RUBELLA SYNDROME

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Introduction/Background

Secondary childhood glaucoma following cataract surgery (GFCS) in children with congenital rubella syndrome (CRS) can affect the visual outcome.[1,2] Scant literature is available regarding its clinical features and management outcomes.[2] We compared the outcome of secondary GFCS performed in infancy in children with CRS with controls.

Methods

Retrospective case control study. Children with CRS (cases) and with infantile cataract (controls) who had undergone cataract surgery during infancy were included. Among these, those who developed GFCS were included. Their clinical profile and outcome of glaucoma management was studied (January 2004-October 2023) and compared.

Results

The CRS group (cases) had 101 eyes (58 children) and the controls included 110 eyes (57 children). There was no significant difference in the mean age at cataract surgery among the two groups (CRS 3.55 ± 3.1 months, non-CRS controls 3.58 ± 2.2 months, $p = 0.96$). Thirty-four eyes of 21 CRS children and 20 eyes of 11 controls developed secondary ocular hypertension or glaucoma. In the CRS group 70.6% eyes had secondary ocular hypertension and 29.4% had glaucoma. Glaucoma management was successful (qualified success) in 76.5% of the CRS eyes and 85% in controls with no significant difference among the two groups ($p = 0.5$). Surgery for glaucoma

management was performed in 8 eyes (6 patients) in CRS group and 9 eyes (6 patients) in controls. Among those who underwent glaucoma surgery, a significantly higher number in CRS group required AGV (Ahmed Glaucoma Valve) implantation as compared to controls ($p = 0.01$).

Conclusion

Prompt management leads to similar treatment success in eyes with GFCS in CRS and infantile cataract. AGV is preferable in CRS eyes.

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OUTCOMES OF SEQUENTIAL ARGON LASER PERIPHERAL IRIDOPLASTY AND LASER IRIDOTOMY IN PATIENTS WITH ANGLE-CLOSURE GLAUCOMA AT A PRIVATE EYE CLINIC IN THE PHILIPPINES

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Introduction

We determined the effectiveness of argon laser peripheral iridoplasty (ALPI) performed a week prior to laser iridotomy (LI) as initial supplementary treatment to lower intraocular pressure (IOP) among Filipino eyes diagnosed with acute angle closure (AAC) or chronic angle-closure glaucoma (CACG). The duration of effectiveness of ALPI+LI in lowering IOP was also determined. The study design was a retrospective chart review.

Methods

Charts of AAC and CACG patients treated by a single ophthalmologist with ALPI prior to LI at the Asian Eye Institute from 2018-2022 were studied. IOP measurements and Anterior Segment Optical Coherence Tomography (ASOCT) scans were taken pre and post treatment. Pre- and post-treatment IOP changes were analysed using paired T-test. The duration of effectiveness was computed using the Kaplan-Meier survival estimate.

Results

Fifty individuals and 68 eyes were included in the study. The average age was 63 ± 10.8 years old and mostly female (76%). Majority of patients had CACG (57.4%). There was a significant reduction in mean IOP from a baseline of 37.66 mmHg to 18.41 mmHg on the same day post-ALPI ($p = 0.0001$) and to 17.21 mmHg at 1-week post-ALPI ($p=0.0001$). Likewise, the mean IOP reduced from 36.76mmHg to 18.76mmHg at 1-month post-ALPI + LI ($p = 0.0001$). The mean LogMAR VA significantly improved from 0.91 to 0.62 ($p = 0.0005$). Among the 41 eyes with

Anterior chamber depth (ACD) values, there was a significant deepening from a mean baseline ACD of 1.96 mm to 2.03 mm post-ALPI+LI ($p = 0.0016$). Kaplan-Meier estimates showed a failure rate of 50% at 2 years.

Conclusion

Performing ALPI a week prior to LI is an effective strategy in lowering IOP in both AAC and CACG patients. In eyes where the duration of effectivity is transient, more definitive subsequent procedures such as trabeculectomy and or lens extraction should be considered for long term success.

VALIDATION OF A DEVICE-INDEPENDENT WEB-BROWSER PERIMETRY SOFTWARE (MELBOURNE RAPID FIELDS) COMPARED TO HUMPHREY FIELD ANALYZER SITA-FASTER FOR GLAUCOMA

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Introduction

Web-browser based perimetry (Melbourne Rapid Fields, MRF-web) provides a low-cost, portable method of visual field testing that could be used in clinic as well as home monitoring for glaucoma patients. This study validates the Melbourne Rapid Fields (MRF-web) perimetry software compared to Humphrey Field Analyzer (HFA)-SITA Faster.

Methods

A total of 178 consecutive stable glaucoma or glaucoma suspect patients were included in this study. For all patients we performed a 24-2 perimetry test using MRF-web running on a LG 27-inch desk top computer with Google Chrome browser. Results of the 24-2 perimetry was compared to outcomes found during the previous visit to our clinic by the same patient on a Humphrey Field Analyser 24-2 SITA faster algorithm (HFA, within ~6 months).

Results

Patient age for the participants ranged from 21-92 (average 61, SD 16). Based on the most recent HFA MD, 72 had normal outcomes (MD >-2); 66 had mild loss (-2 > MD > -6); 13 had moderate loss (-6 > MD > -12); 13 advanced (-12 > MD > -20) and 14 severe (MD < -20) loss. MRF-web took on average 1 min longer than the 24-2 SITA-Faster test. The Mean Deviations of both tests were highly correlated (ICC = 0.93), and the linear regression had a slope of 0.98 (Figure 1). Bland-Altman methods found a bias

of -0.4 dB for MD with 95% Limits of Agreement of -2.2 dB to 1.4 dB in normal observers.

Conclusion

MRF-web allows patients to have visual field test performed using a web-browser independent of device (applicable for tablets, laptop, and desktop computers), with outcomes comparable to HFA 24-2 SITA faster. This software has significant applications as an alternative to standard perimetry in clinic and for glaucoma telehealth with in-home testing.

Figures

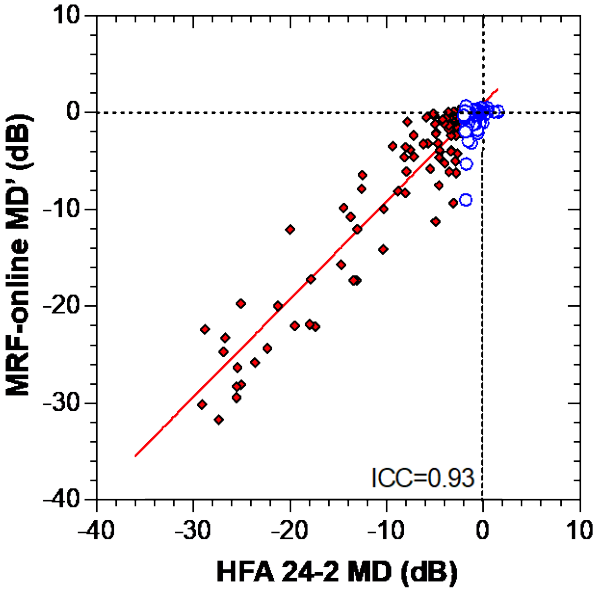

Figure 1. Concordance between MRF MD' (MD' is the raw MRF MD adjusted for spot size) and the MD for HFA Sita-faster, ICC = 0.93.

THE EFFECT OF GONIOSCOPY ASSISTED TRANSLUMINAL TRABECULOTOMY FOR POSNER-SCHLOSSMAN SYNDROME

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Introduction

To investigate the IOP-lowering effect and the safety of gonioscopy-assisted transluminal trabeculotomy (GATT) for Posner-Schlossman syndrome (PSS).

Methods

It is a retrospective study. Those patients diagnosed as PSS who had medically uncontrolled IOP and accepted GATT surgery were included. The IOP values before and after surgery were noted. The possible complications were also recorded.

Results

A total of 13 eyes of 13 PSS patients, 9 male and 4 female, were included. The mean age was 35. Among them, 2 cases were accompanied with juvenile open-angle glaucoma and 1 case were accompanied with primary open-angle glaucoma. Seven cases accepted GATT only and 5 cases accepted GATT together with phacoemulsification. The cup/disc ratio was 0.75. The mean IOP before surgery was 29.8 ± 11.7mmHg, and the IOP after surgery were 12.2 ± 5.6 mmHg at 1 day, 17.0 ± 10.8 mmHg at 1 week, 14.6 ± 4.9 mmHg at 1 month, 12.3 ± 4.3 mmHg at 3 months, 11.3 ± 1.3 mmHg at 6 months and 12.0 ± 0.9 mmHg at 1 year, respectively. Five cases suffered IOP spike more than 20 mmHg at 1-week post-surgery and could be well controlled by medications. During follow-up, 3 cased had recurrent inflammation.

Conclusion

GATT seemed to be an effective and safe choice for PSS patients who had glaucomatous optic neuropathy to achieve a desirable IOP level.

INCREASED INCIDENCE OF GLAUCOMA AND INTRAOCULAR PRESSURE FLUCTUATION AFTER VITRECTOMY FOR MACULAR HOLE AND MACULAR PUCKER

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Introduction

To investigate the incidence of glaucoma and intraocular pressure fluctuation (IOPF) after vitrectomy for macular pucker (MP) and macular hole (MH).

Methods

This retrospective cohort study enrolled patients from the Chang Gung Research Database (CGRD). Glaucoma was defined as the continuous prescription of anti-glaucoma eyedrops at least 3 months, and the diagnosis was made later than postoperative 60 days (the index date). IOPF was the standard deviation (SD) of intraocular pressure (IOP) measures. Postoperative IOPF was defined as the SD of all IOP measures after the index date, while the postoperative pretreatment IOPF was defined as the SD of IOP measures from the index date to the initiating date of glaucoma treatment.

Results

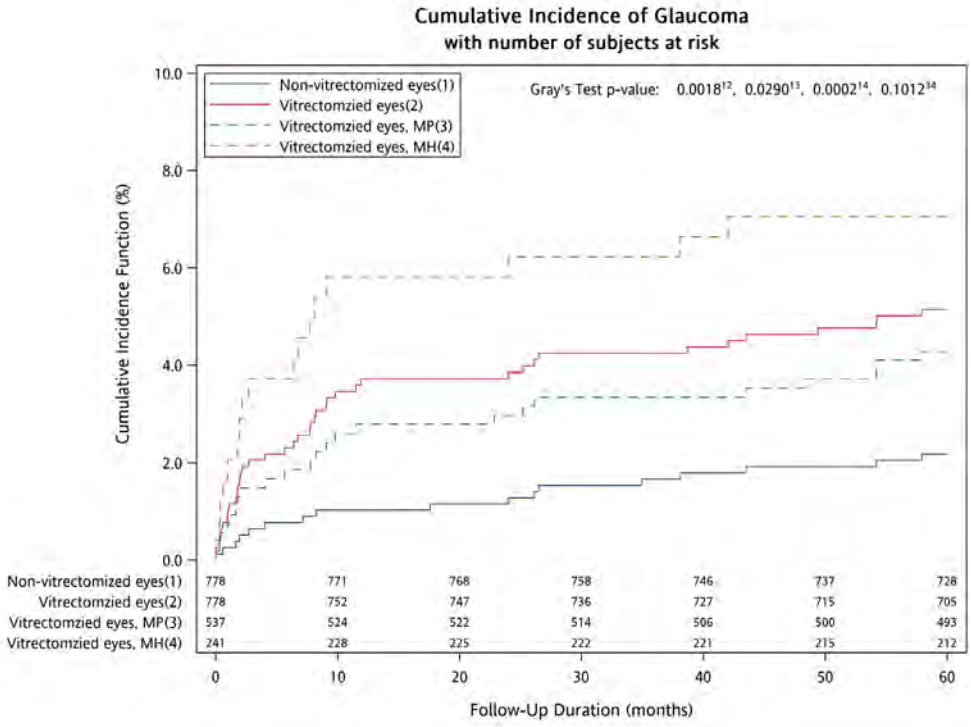
Among 778 patients from CGRD, 40 eyes in vitrectomized eyes and 17 eyes in non-vitrectomized fellow eyes developed glaucoma in postoperative 60 months. The vitrectomized eyes had a higher glaucoma incidence rate (9.06, 95% CI: 6.25-11.86) than fellow eyes (3.75, 95% CI: 1.97-5.53) and showed higher postoperative IOPF (1.93 vs. 1.74 mmHg, $P = 0.004$) and higher postoperative pretreatment IOPF (1.88 vs. 1.72 mmHg, $P = 0.001$). Among the vitrectomized eyes, those with glaucoma development had higher postoperative IOPF (2.79 vs. 1.85 mmHg, $P < 0.0001$) and higher postoperative pretreatment IOPF (2.32 vs. 1.85 mmHg, $P = 0.04$) than those

without. Cox proportional hazards regression revealed that preoperative average IOP and postoperative IOPF were associated with glaucoma incidence after vitrectomy.

Conclusion

Eyes receiving vitrectomy for MP or MH were at higher risk for glaucoma development. Increased IOPF was observed after vitrectomy, and elevated postoperative IOPF was associated with glaucoma development.

Figures



RATE OF PROGRESSION AMONG DIFFERENT AGE GROUPS IN GLAUCOMA WITH HIGH MYOPIA: A 10-YEAR FOLLOW-UP COHORT STUDY

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Purpose

To investigate the rate of structural, functional progression in different age groups of highly myopic glaucoma patients and identify the associated risk factors.

Methods

This study included open-angle, normal-tension glaucoma (NTG) patients with high myopia who had been followed-up for at least 8 years. Patients were divided into 2 age groups, “younger” (under age 40) and “older” (age 40 or over), according to their age at presentation. The progression rate for visual field index (VFI), mean deviation (MD), and peripapillary retinal nerve fibre layer (RNFL) thickness were evaluated. An intergroup comparison was performed, and the associations between age and the progression rates for structural, functional parameters were assessed by scatter plots with linear regression and locally weighted scatterplot smoothing. Univariate and multivariate regression analysis was performed to identify factors for rate of functional progression.

Results

A total of 320 eyes of highly myopic NTG patients (mean age at presentation, 38.7 ± 10.4 years) were included in this study with mean follow-up of 13.1 ± 6.2 years. The mean rate of MD change was -0.36 ± 0.39 dB/year in younger group and -0.22 ± 0.27 dB/year in older group ($p < 0.01$). In the locally weighted scatterplot, the rate of change in VFI, MD, and RNFL thickness showed a fast-progressing pattern in those aged 20–29 and 40-49 years, and a slow-progressing pattern in those aged 30–39 and

50 years or older. Among risk factors, baseline IOP (β = -0.041; p = 0.047) and VFI (β = 0.364; p < 0.01) was significantly related to the rate of VF MD change.

Conclusions

The rate of glaucoma progression showed a bimodal pattern and was significantly associated with age at presentation in highly myopic NTG patients. The baseline IOP and VFI was significantly related to the rate of functional progression. These findings emphasize the importance of early treatment of such patients in clinical practice.

EFFECTIVENESS AND SAFETY OF SWITCHING TO FIXED-DOSE COMBINATION OF PRESERVATIVE-FREE TAFLUPROST/TIMOLOL TREATMENT OF OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION: THE FIRST PROSPECTIVE REAL-WORLD STUDY IN TAIWAN

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Introduction

In this real-world study in Taiwan, we assessed the effectiveness, safety, and tolerability of preservative-free fixed-dose combination of tafluprost (0.0015%) and timolol (0.5%) (PF tafluprost/timolol FC) in patients with open-angle glaucoma (OAG) or ocular hypertension (OHT).

Methods

This was a prospective, non-interventional study conducted in patients with OAG or OHT, who were not responding sufficiently to topical prostaglandin analogue (PGA) monotherapy and were therefore switched to PF tafluprost/timolol FC treatment. The primary endpoint was the mean change in intraocular pressure (IOP) from the baseline to 6 months after PF tafluprost/timolol FC initiation. Changes in clinical signs and subjective symptoms were also assessed. Adverse events (AEs) were recorded for safety assessment.

Results

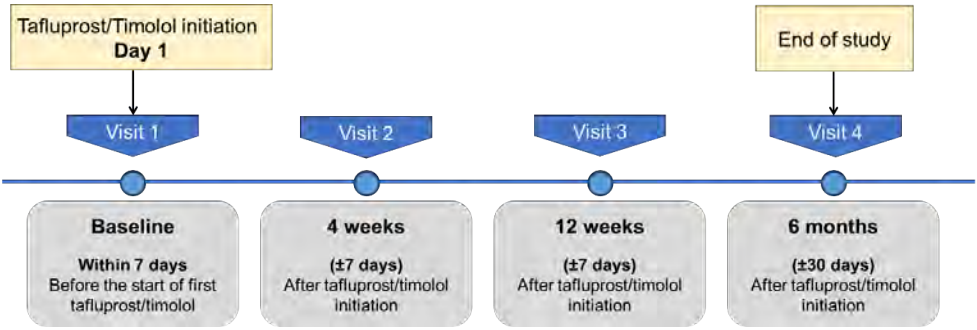
A total of 49 patients were enrolled and 42 patients completed the study. The mean ± standard deviation (SD) age was 59.4 ± 11.1 years and 55% of patients were male. The mean ± SD IOP at baseline was 16.5 ± 3.5 mmHg, which significantly decreased to 15.4 ± 3.4 (absolute reduction: 1.1 ± 2.6 mmHg) at 6 months ($P < 0.001$). The mean IOP significantly decreased to 14.8 ± 3.0 mmHg at week 4 ($P < 0.001$) and 15.3 ± 3.4 mmHg at week 12 ($P = 0.02$). The proportion of patients with tear break-up time >10 seconds significantly increased from 7.5% at baseline to 52.5% ($P < 0.001$) at 6

months. However, a non-significant increase was observed in subjective symptoms. Six treatment-related AEs were reported, all were non-serious and mild/moderate in severity including contact dermatitis, redness and itchiness, and blurred vision.

Conclusion

This real-world, prospective study in Taiwan showed that switching to the PF tafluprost/timolol FC from PGA monotherapy in patients with OAG or OHT was effective and safe for IOP reduction.

Figures



SELECTIVE LASER TRABECULOPLASTY IN PATIENTS WITH GLAUCOMA FOLLOWING REFRACTIVE SURGERY

Lee S

Objective

Laser trabeculoplasty effectively reduces intraocular pressure (IOP) in primary open angle glaucoma, with argon laser trabeculoplasty (ALT) and selective laser trabeculoplasty (SLT) showing equivalent outcomes. However, it is unclear which laser modality is more effective in pseudoexfoliation (PXE) glaucoma. This study aims to compare the effectiveness of ALT and SLT in glaucoma with myopia.

Design

Retrospective cohort study.

Methods

A chart review evaluating patients diagnosed with PXE glaucoma and treated with laser trabeculoplasty from 2005 to 2015. Patients with previous glaucoma surgery, other forms of secondary glaucoma, ocular surgery within six months of initial trabeculoplasty or lacking preoperative IOP measurements were excluded. Post-laser measurements were recorded until 24 months after initial intervention. Follow-up data was censored if the patient underwent a subsequent trabeculoplasty different from initial laser treatment.

Results

We included 84 patients in the ALT group and 123 in the SLT group. The mean (SD) baseline IOP values were 22.7 (± 5.6) and 21.6 (±4 .8) respectively (p = 0.11), while number of medications were 2.0 (± 1.0) and 1.8 (± 1.3) for ALT and SLT groups respectively (p = 0.36). The mean IOP reduction for the ALT group at 6, 12 and 24 months were 5.2 (± 6.1), 5.4 (± 6.9), and 4.9(± 7.7) respectively. The corresponding values for the SLT group were 3.4 (± 5.2), 3.8 (± 4.6), and 4.6 (± 6.5). Comparison of

both lasers at each time point revealed no significant differences ($p > 0.05$) in IOP reduction or reduction of glaucoma medication.

Conclusions

Our study showed equivalent efficacy between ALT and SLT in patients with glaucoma following refractive surgery.

THE CULPRIT BEHIND UNCONTROLLED INTRAOCULAR PRESSURE FINALLY REVEALED

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Introduction

Shuttlecock injury leads to traumatic uveitis, angle recession glaucoma and traumatic cataract.[1] Secondary high intraocular pressure can happen due to those injuries as well as the intensive steroid treatment.[2] Multiple aetiologies of high intraocular pressure were explored, phacolytic glaucoma turned out to be the main cause.

Methods

Case report.

Results

A 23-year-old man, presented with right eye pain and redness with blurred vision following shuttlecock injury. Upon examination, his vision over right eye was counting finger, left eye 6/6. There was no RAPD elicited. The conjunctiva was injected with clear cornea, anterior chamber was deep, cells of 4+, grade 1 hyphaema, pupil mid-dilated with sphincter tear at 1 o'clock. Lens was clear. Fundus shows commotio retinae at superotemporal quadrant with spots of intraretinal haemorrhage. The right eye intraocular pressure was 20 mmHg. Left eye was unremarkable. Over the course of 4 weeks, he developed cataract. Despite subsiding inflammation and with maximal antiglaucoma medication, intraocular pressure hovered around 40 to 50 mmHg. Gonioscopy examination showed angle recession of 3 quadrants with patchy peripheral anterior synechiae, no deoxygenated blood or lens particle seen. He was then planned for right eye lens

intracapuslar cataract extraction with scleral fixated intraocular lens. Postoperatively, the intraocular pressure was normalised to 16 mmHg.

Conclusion

Shuttlecock injury commonly results in hyphema and angle recession.[3] Those lead to raised intraocular pressure.[4] In our case, phacolytic glaucoma was the main cause. It is difficult to treat in the beginning, considering that it can also be caused by inflammation or steroid induced glaucoma. However, appropriate treatments should be started to lead us to the definitive cause and management.

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RANIBIZUMAB ASSOCIATED INFLAMMATION

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Introduction

Ranibizumab has become the standard of care of macula oedema in many countries.[1] It has shown to be able to cause intraocular inflammation.[2]

Methods

Case report

Results

A 64-year-old man presented with left eye sudden drop in vision associated with headache and vomiting after receiving intravitreal ranibizumab. On examination, right eye vision was 1/60, left eye was hand movement. The left eye conjunctiva was injected, cornea hazy with cornea bedewing, anterior chamber shallow with pre-existing posterior synechiae, cells 4+ with fibrin seen centrally, and grade 1 hyphaema. The fundus view was limited, B scan findings were normal. Intraocular pressure was 40. The anterior segment findings for right eye were unremarkable, there was fibrosis seen in the inferior pole. Patient was started on maximum antiglaucoma medication and intensive topical steroids. However, his intraocular pressure remained uncontrolled. The intense inflammation further exacerbated his pre-existing posterior synechiae with iridocorneal touch, causing secondary acute glaucoma. He then underwent anterior chamber paracentesis and surgical peripheral iridectomy. On his subsequent follow-up, vision had improved to 6/36 with intraocular pressure of 8 to 10 mmHg.

Conclusion

Treatment with ranibizumab has shown lowest sterile inflammation rate compared to other anti-VEGF drugs.[3] In our case, the patient was given intravitreal ranibizumab and developed inflammation. The prolonged course and repeated injection with Ranibizumab can increase the risk of inflammation.[4] Patient-specific immune response are unavoidable, to reduce other risks, care should be taken on manufacturing impurities, medication preparation and administration.

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EVALUATION OF KNOWLEDGE, ATTITUDE, AND PRACTICE ON MINIMALLY INVASIVE GLAUCOMA SURGERY AMONG JUNIOR AND SENIOR OPHTHALMOLOGISTS IN MALAYSIA

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Introduction

Minimally invasive glaucoma surgery (MIGS) has gained popularity as one of the surgical interventions for reduction of intraocular pressure (IOP). However, due to reluctant of the ophthalmologists and patients' financial constraint, MIGS has yet to receive wide acceptance in many developing countries. Understanding the knowledge, attitudes and practice among ophthalmologists is important to ensure good quality of clinical practice. This questionnaire-based study is aimed to evaluate knowledge, practice pattern, and explore the attitudes of MIGS among junior and senior ophthalmologists in Malaysia.

Methods

A two-phase of comparative cross-sectional study was conducted between April 1, 2023 and September 28, 2023. Phase 1 comprised of development and validation of questionnaire. Upon completion of piloting of the questionnaire, phase 2 of the study was conducted. An online self-administrated questionnaire was conducted among junior and senior ophthalmologists. Junior is defined as ophthalmologists with 5 years' experience and below and those who are more than 5 years are senior ophthalmologists.

Results

A total of 174 ophthalmologists (110 juniors and 64 seniors) responded and completed the questionnaire. There was no significant difference in term of knowledge ($p = 0.189$) and eagerness to try this new technique ($p = 0.7$) between

junior and senior ophthalmologists. The junior ophthalmologists preferred to have wet lab sessions prior to adopting MIGS in their practice. While seniors preferred to have more clinical evidence on the efficacy and safety of MIGS. Only 16.1% had experience with MIGS for mean duration of 0.5 years (SD 0.25), with mainly trabecular meshwork-based MIGS. Many expressed that the patients' financial status (55%) and their choice (24%) affect their preference of adopting MIGS in their practice.

Conclusion

In Malaysia, the knowledge and attitude towards adopting MIGS in clinical practice is not affected by seniority or clinical experience. Patients' financial status seem to play significant role in selecting surgical intervention in our clinical practice.

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SURGICAL OUTCOME OF PAUL GLAUCOMA IMPLANT: ONE-YEAR REVIEW

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Introduction

Paul Glaucoma Implant (PGI) is a novel glaucoma drainage device. The objective of this study is to evaluate the efficacy and safety of PGI in a tertiary centre in Malaysia.

Methods

This is a retrospective review of patients undergoing PGI surgery in Raja Permaisuri Bainun Hospital, Ipoh, Malaysia, from April 2021 to December 2022. Primary outcomes included success rate which defined as IOP between 6 and 21 mmHg without topical or systemic glaucoma medications (complete success) or with topical glaucoma medications (qualified success). Failure was defined as persistent IOP below 6 mmHg or above 21 mmHg, need for additional glaucoma surgery, explantation of PGI, or cases with loss of light perception.

Results

Thirty-six eyes of 34 patients were included. Thirty-three eyes were done with PGI alone, while 2 eyes were combined PGI with phacoemulsification, and 1 eye was combined PGI and explantation of other GDD. The success rate of PGI surgery at 1-year follow-up was 91.7% (complete success 47.2%, qualified success 44.4%). Mean IOP reduced from 30.36mmHg to 13.97 mmHg ($p < 0.001$) with reduction of IOP-lowering agent from 4.14 to 1.22 ($p < 0.001$). Visual acuity improved from 0.9 LogMAR to 0.67 LogMAR ($p = 0.042$). Complications that required additional surgeries included tube blockage, aqueous misdirection, persistent vitreous haemorrhage, and implant exposure.

Conclusion

In our study, PGI showed good success rate of 91.7% in the first year and effectively reduced the mean IOP and IOP-lowering agents, which is comparable to other studies.

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RECENT ADVANCEMENTS IN GLAUCOMA SURGERY: A REVIEW

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Introduction

Surgery has long been an important treatment for limiting optic nerve damage and minimising visual loss in patients with glaucoma. Numerous improvements, modifications, and innovations in glaucoma surgery over recent decades have improved surgical safety and have led to earlier and more frequent surgical intervention in glaucoma patients at risk of vision loss. This review summarises the latest advancements in trabeculectomy surgery, glaucoma drainage device (GDD) implantation, and minimally invasive glaucoma surgery (MIGS).

Methods

A comprehensive search of MEDLINE, EMBASE, and CENTRAL databases, alongside subsequent hand searches was performed, with a combination of keywords and relevant MeSH terms. The search was restricted to only adult studies (> 19 years of age) and studies published in English and was limited to the past 10 years for trabeculectomy and GDDs, and the past 5 years for MIGS.

Results

Literature search yielded 2,283 results, 58 of which were included in the final review (8 trabeculectomy, 27 GDD, and 23 MIGS). Advancements in trabeculectomy were described in terms of adjunctive incisions, Tenon's layer management, and novel suturing techniques. Advancements in GDD implantation pertain to modifications

of surgical techniques and devices, novel methods to deal with postoperative complications and surgical failure, and the invention of new GDDs. Finally, the popularity of MIGS has recently promoted modifications to current surgical techniques and the development of novel MIGS devices.

Conclusion

There have been significant advancements in all major types of glaucoma surgery – trabeculectomy, GDD implantation, and MIGS. The increasing armamentarium of available surgical procedures and modified techniques will allow glaucoma surgeons to further personalise a patient's surgical treatment based on the desired magnitude of IOP reduction and anatomical and disease characteristics of the eye, whilst considering the risk-benefit ratio of various techniques.

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Tables, Figures, and Illustrations

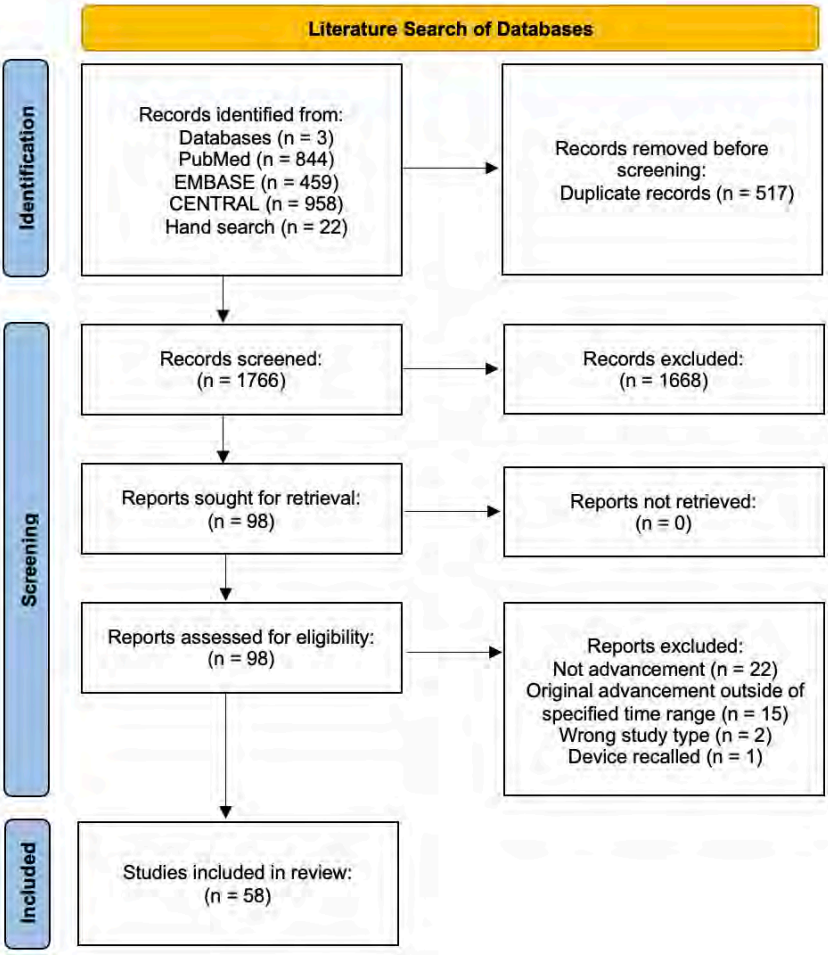

Figure 1. PRISMA flowchart.

PAEDIATRIC WAGR PATIENT WITH ANIRIDIA-ASSOCIATED GLAUCOMA

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Introduction

When encountering a newborn with congenital abnormalities, early identification of known syndromes is vital. Congenital bilateral aniridia for example, may predispose to glaucoma due to angle structural malformation, leading to dysregulation of regular aqueous flow.[1] Aniridia is most commonly linked to WAGR syndrome.[2] WAGR syndrome represents a constellation of congenital comorbidities, with each letter denoting one associated finding: W for Wilm's tumour; A for aniridia; G for genitourinary malformation; and R for mental retardation.[3] Secondary glaucoma is immediately visually threatening, requiring prompt identification.[4]

Methods

Case report.

Results

A one year and seven-month-old with left eye (OS) corneal opacity had comorbid congenital abnormalities, including ambiguous genitalia, bilateral aniridia, global developmental delay, and congenital cataract OS. The possibility of WAGR syndrome was considered and confirmed with later development of Wilm's tumour. The patient exhibited corneal scarring, aniridia, and elevated intraocular pressure (IOP) of 65 mmHg OS. Initial surgical intervention, trabeculectomy and trabeculotomy, provided medium-term pressure control, but with poor prognosis for vision based on follow-up assessments.

Conclusion

Syndromic abnormalities, when identified early, facilitate pre-empting future complications. In our WAGR syndrome case, multiple comorbid malformations, aside from aniridia were present.[5,6] Glaucoma development in WAGR patients poses significant challenges, with poorer outcomes compared versus non-syndromic aniridia.[7] Early surgical intervention is advised as medical management often fails for long-term pressure control.[8] Genetic testing would have been ideal for confirming chromosome 11 gene deletion. More specific genetic testing, fluorescent in situ hybridization, may be done to screen for deletion of specific genes on the affected chromosome.[9] Regular consults and multispecialty management is necessary to provide optimum care for these patients.

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CLASSIFICATION OF VISUAL FIELD ABNORMALITIES IN HIGHLY MYOPIC EYES WITHOUT PATHOLOGIC CHANGE

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Introduction

To develop a classification system of visual field (VF) abnormalities in highly myopic eyes with and without glaucoma.

Methods

A total of 1,893 VF tests from 1302 eyes were included. All participants underwent VF testing (Humphrey 24-2 SITA standard program) and detailed ophthalmic examination. A comprehensive set of VF defect patterns was defined via observation of the 1893 VF reports, literature review, and consensus meetings. The classification system consisted of four major types of VF patterns, including normal, glaucoma-like defects (paracentral defect, nasal step, partial arcuate defect, arcuate defect), high myopia-related defects (enlarged blind spot, vertical step, partial peripheral rim, non-specific defect), and combined defects (nasal step with enlarged blind spot). A subset (n = 1000) of the VFs was used to evaluate the inter- and intra-observer agreement and weighted κ values of the system by two trained readers. The prevalence of various VF patterns and its associated factors were determined.

Results

We found that normal, glaucoma-like defects, high myopia-related defects, and combined defects accounted for 74.1%, 10.8%, 15.0%, and 0.1% of all VF defects, respectively. The inter- and intra-observer agreement were > 89% and the κ value were ≥ 0.86 between readers. Both glaucoma-like and high myopia-related VF defects were associated with older age ($P < 0.001$) and longer axial length ($P < 0.05$). Longer axial length had a stronger effect on the prevalence of glaucoma-like VF defects than on the prevalence of high myopia-related VF defects ($P = 0.036$).

Conclusion

We propose a new and reproducible classification system of VF abnormalities for non-pathological high myopia. Applying a comprehensive classification system will facilitate communication and comparison of findings among studies.

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RISK OF PRIMARY OPEN-ANGLE GLAUCOMA BETWEEN SYSTEMIC B-BLOCKERS AND CALCIUM CHANNEL BLOCKERS

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Introduction

Beta-blockers and calcium channel blockers are widely prescribed for cardiovascular issues, but their impact on the risk of sight-threatening ocular diseases, like glaucoma, is unclear. This study employed real-world data from the Chang Gung Research Database in Taiwan to compare the risks of primary open-angle glaucoma (POAG) between beta-blocker and calcium channel blocker users.

Methods

This study emulated a target trial with patient data from the multi-institutional Chang Gung Research Database (CGRD) in Taiwan. In total, 71,023 patients with cardiovascular-associated issues using beta-blockers and calcium channel blockers between 2010-2022 were identified. 10,249 patients were excluded due to missing demographics, age < 18 years old diagnosis of any other retinal diseases, concomitant use of beta- and calcium channel- blockers, prior use of any study drug. Baseline characteristics were balanced using inverse probability of treatment weighting with propensity scores. Incidence of POAG served as the primary outcome. The need for surgical intervention for glaucoma, peak intraocular pressure (IOP), IOP fluctuation and use of glaucoma medications > 1 for glaucoma control served as secondary outcomes.

Results

There were 29,314 beta-blocker and 31,460 calcium channel blocker users included for the analysis. Calcium channel blocker users exhibited significantly higher

cumulative hazard for POAG compared to the beta-blocker users ($p < 0.05$). Both groups had similar incidence of glaucoma surgeries (including trabeculectomy and plate-based tube shunts), IOP peak and fluctuation. Beta-blocker users had a relatively lower prevalence of concurrent antiglaucoma medication use > 1 compared to calcium channel blockers.

Conclusion

Compared to patients under the use of beta blockers, calcium channel blocker users had a higher risk of POAG. The similar IOP profiles between the two medications suggested factors beyond IOP as possible contributors of POAG risks in these patients.

A CASE OF UVEITIS GLAUCOMA HYPHEMA SYNDROME SECONDARY TO A SINGLE-PIECE ACRYLIC, SULCUS-FIXATED, INTRAOCULAR LENS

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Introduction

This is a case of a 68-year-old Filipino female who initially presented 2 years ago with non-traumatic, painless, gradual blurring of vision on the right eye despite previously undergoing bilateral cataract surgery more than 5 years ago. On dilated fundus examination, dislocation of posterior chamber intraocular lens was noted and patient underwent pars plana vitrectomy and removal of dropped lens with insertion of scleral fixated single piece acrylic intraocular lens. Postoperatively, patient's vision improved to 20/20.

Methods

In the course of the following year, multiple clinic visits were sought due to complaints of redness, eye pain and swelling with findings of intermittent fluctuations in intraocular pressure of the right eye ranging between 13 mmHg to 26 mmHg. Vision would also intermittently get worse, as low as 20/63, and findings of superotemporal wrinkling of the macula with epiretinal membrane, and cystoid macular oedema was noted on further examination of the fundus. Patient was started with intraocular pressure lowering topical medications and steroidal drops of which she responded quite well.

Results

Towards the end of the same year, recurrences of right eye redness associated with intermittent blurring of vision and pain were noted. Shifting visual acuity observed to as low as 20/125 and subsequent clinic examinations revealed progressive increase in intraocular pressure, peaking at 52 mmHg. Other findings revealed inferior endothelial pigment deposition, a deep chamber with 2-3+ cells, a 6mm,

fixed, dilated pupil with notable iris atrophy secondary to chaffing of the iris, disenclavation of the nasal portion of the intraocular lens, +4 pigmentation along the inferior half of the angles, and central macular oedema.

Conclusion

Patient was managed as a case of uveitis-glaucoma-hyphaema syndrome. To address the rising intraocular pressure, viscocanaliculoplasty was done which yielded more than 6 months of controlled intraocular pressure of the right eye along with good visual acuity.

ASSOCIATION OF THE NASOPHARYNGEAL CARCINOMA AND THE SUBSEQUENT OPEN GLAUCOMA DEVELOPMENT: A NATIONWIDE COHORT STUDY

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Introduction

Nasopharyngeal carcinoma (NPC) is an epithelial carcinoma that grows in the nasopharyngeal region. NPC in the advanced stage and the radiotherapy during the NPC treatment could damage nearby regions like the orbital and cervical area. Ophthalmic complications in the individuals with NPC have been demonstrated in the previous research. The orbit is the most common region of ophthalmic involvement in the patients with NPC which account for nearly 50 % of NPC cases with ophthalmic complications. However, there are few studies evaluating the relationship between the NPC and open-angle glaucoma (OAG). Because the OAG is a type of neuropathy and optic neuropathy has been found in patients with NPC, the existence of NPC may be associated with following OAG which need additional investigation.

Methods

The retrospective research applying the National Health Insurance Research Database (NHIRD) of Taiwan was conducted with a follow up period from January 1, 2000 to December 31, 2016. There were 4184 and 16736 participants that selected and categorized into the NPC and non-NPC groups after exclusion. The major outcome of our study was the development of OAG according to diagnostic codes, exam and managements. The Cox proportional hazard regression was employed to estimate the adjusted hazard ratio (aHR) and 95% confidence interval (CI) of OAG between the two groups.

Results

In this study, 151 and 513 OAG episodes occurred in the NPC and non-NPC groups, respectively, and the NPC population showed a significantly higher incidence of OAG compared to the non-NPC population in multivariable analysis (aHR: 1.293, 95% CI: 1.077–1.551, p = 0.0057). Besides, the cumulative probability of OAG was significantly higher in the NPC group than that in the non-NPC population (p = 0.0041). About other risk factor for OAG, age older than 40 years old, diabetes mellitus, and persistent steroid usage were related to OAG occurrence (all $p < 0.05$).

Conclusion

In conclusion, the existence of NPC is significantly correlated to the subsequent OAG after adjusting multiple covariates. Furthermore, the incidence of OAG elevated significantly as the disease interval of NPC increases. A further large-scale prospective study to reveal whether the presence of NPC will alter the prognosis of OAG is mandatory.

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Tables, Figures, and Illustrations

Table 1. Characteristics among nasopharyngeal carcinoma group and control group after propensity score matching

Character	Non-NPC (N= 16736)	NPC (N= 4184)	ASD
Year of index			0.0000
2001-2005	8010 (47.86%)	2020 (48.28%)	
2006-2010	5168 (30.88%)	1305 (31.19%)	
2011-2015	3558 (21.26%)	859 (20.53%)	
Sex			0.0244
Female	5952 (35.56%)	1537 (36.74%)	
Male	10784 (64.44%)	2647 (63.26%)	
Age			0.0567
20-30	1349 (8.06%)	326 (7.79%)	
30-40	2914 (17.41%)	687 (16.42%)	
40-50	4485 (26.80%)	1100 (26.29%)	
50-60	4363 (26.07%)	1078 (25.76%)	
60-70	2285 (13.65%)	607 (14.51%)	
70-80	1032 (6.17%)	300 (7.17%)	
80-100	308 (1.84%)	86 (2.06%)	
Co-morbidities			
Hypertension	3148 (18.81%)	851 (20.34%)	0.0386
DM	1567 (9.36%)	407 (9.73%)	0.0124
AMI	19 (0.11%)	5 (0.12%)	0.0018
Stable CAD	683 (4.08%)	210 (5.02%)	0.0450
Hyperlipidemia	1529 (9.14%)	424 (10.13%)	0.0338
Cerebrovascular disease	752 (4.49%)	201 (4.80%)	0.0148
Pulmonary diseases	1348 (8.05%)	456 (10.90%)	0.0972
Rheumatic disease	132 (0.79%)	46 (1.10%)	0.0321
Kidney disease	420 (2.51%)	111 (2.65%)	0.0090
Persistent steroid usage	1737 (10.38)	471 (11.25)	0.0580

NPC: nasopharyngeal carcinoma, N: number, ASD: absolute standardized difference, DM: diabetes mellitus, AMI: acute myocardial infarction

Table 2. The events of open angle glaucoma between the two groups

Outcome	Non-NPC (N= 16736)	NPC (N= 4184)	p value
Median follow up months and range (min to max)	85 (38-177)	69 (37-180)	
Person-months	1697960	385200	
Event	513	151	
Incidence density† (95% CI)	0.30(0.28-0.33)	0.39(0.33-0.46)	
Crude HR (95% CI)	Reference	1.303 (1.087-1.563)*	
aHR (95% CI)	Reference	1.293 (1.077-1.551)*	0.0057*

aHR: adjusted hazard ratio which including variables listed in Table 1, CI: confidence interval * denotes significant difference between the two groups † Crude incidence rate, per 1000 person-months.

Table 3. Cox regression for estimate the hazard ratio of open angle glaucoma

Parameters	aHR (95% CI)	p value
NPC	1.293 (1.077-1.551)	0.0057*
Year of index (ref=2001-2005)		
2006-2010	0.854 (0.702-1.038)	0.1125
2011-2015	0.765 (0.530-1.106)	0.1547
Sex (ref= Female)		
Male	0.832 (0.705-0.980)	0.0281
Age (ref=30-40)		
20-30	0.820 (0.474-1.419)	0.4792
40-50	1.678 (1.191-2.365)	0.0031*
50-60	3.670 (2.634-5.115)	<0.0001*
60-70	5.534 (3.850-7.953)	<0.0001*
70-80	5.692 (3.746-8.648)	<0.0001*
80-100	3.391 (1.601-7.184)	0.0014*
Co-morbidities		
Hypertension	1.034 (0.849-1.261)	0.7376
DM	2.132 (1.724-2.635)	<0.0001*
AMI	2.798 (0.673-11.635)	0.1571
Stable CAD	0.845 (0.604-1.181)	0.3234
Hyperlipidemia	0.932 (0.729-1.192)	0.5743
Cerebrovascular disease	1.038 (0.752-1.432)	0.8199
Allergic pulmonary diseases	1.128 (0.894-1.424)	0.3110
Rheumatic disease	1.352 (0.742-2.463)	0.3240
Kidney disease	1.085 (0.716-1.644)	0.7006
Persistent steroid usage	1.890 (1.642-2.176)	<0.0001*

NPC: nasopharyngeal carcinoma, DM: diabetes mellitus, AMI: acute myocardial infarction * denotes significant difference between the two groups

PLSCR1 PROMOTES APOPTOSIS AND CLEARANCE OF RETINAL GANGLION CELLS IN GLAUCOMA PATHOGENESIS

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Introduction

The molecular mechanisms of glaucoma remain largely unknown. PLSCR1 promotes phosphatidylserine (PS) exposure and apoptosis in central nervous system. Here, we aimed to explore the connection between PLSCR1 and retinal microglia, and revealed their relationships with retinal ganglion cells (RGCs) death.

Methods

Western blotting and immunofluorescence were used to detect PLSCR1 expression in WT and transgenic mice overexpressing human PLSCR1 (PLSCR1-TG mice) and retinal progenitor cells (RPC). pSIVA and flow cytometry were conducted to evaluate the PS exposure and apoptosis. HE staining, immunofluorescence, and toluidine blue staining were performed to explore retinal RGC survival after acute ocular hypertension (AOH). DHE and TUNEL staining were used to detect the ROS generation and apoptosis of retina. RT-qPCR and retinal flatmount was used to detect the M1/M2 marker of microglia. The RNA-Seq of retina treated with AOH were analysed.

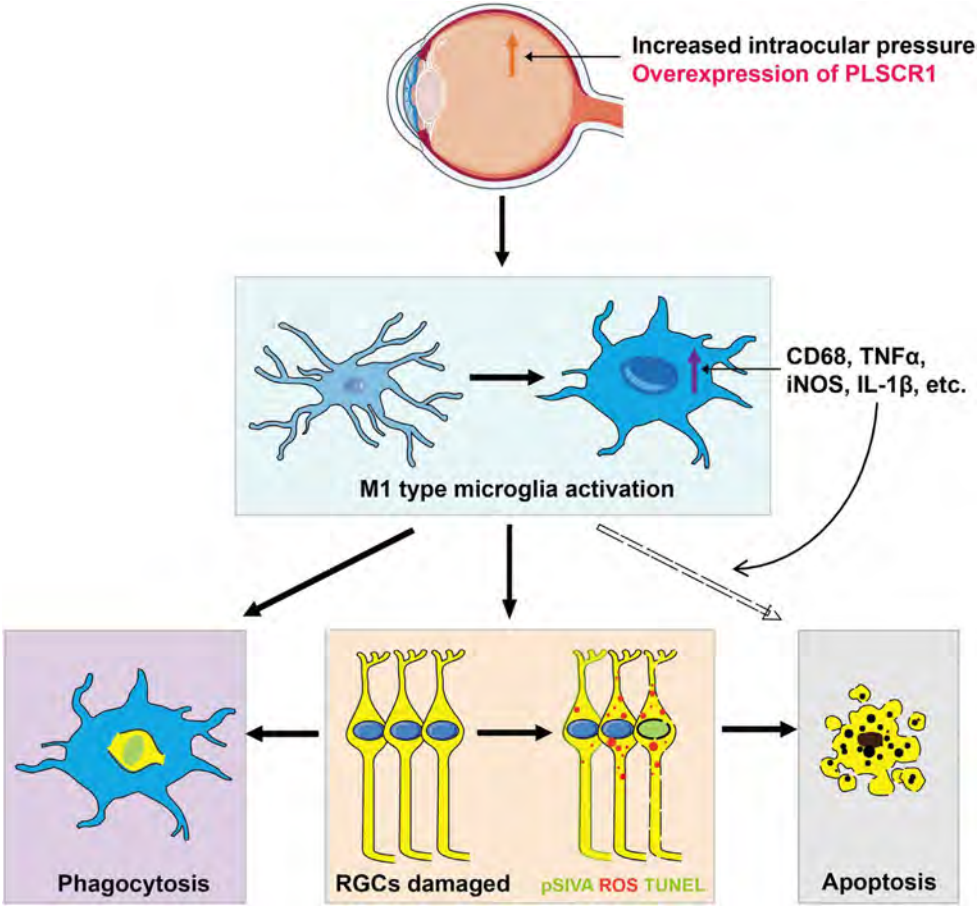
Results

We found that overexpressed PLSCR1 induced its translocation from the nucleus to the cytoplasm and cytomembrane, as well as elevated PS exposure and ROS generation with subsequent RGC apoptosis and death in both RPC and mice. These damages were effectively attenuated by PLSCR1 inhibition. In the AOH model, PLSCR1 led to an increase in M1 type microglia activation and retinal neuroinflammation. Upregulation of PLSCR1 resulted in strongly elevated phagocytosis of apoptotic RGCs by activated microglia.

Conclusion

In summary, we demonstrate that PLSCR1 is a key regulator in promoting RGCs apoptosis and clearance by M1 type microglia, which leads to the retina and optic nerve injury and visual function impairment. Our study provides important insights linking activated microglia to RGC death in the glaucoma pathogenesis and other RGC-related neurodegenerative diseases.

Figure


Increased intraocular pressure
Overexpression of PLSCR1
CD68, TNFα,
iNOS, IL-1β, etc.
M1 type microglia activation
Phagocytosis
RGCs damaged
pSIVA ROS TUNEL
Apoptosis

SUBCAPSULAR CATARACT FORMATION AFTER LASER IRIDOTOMY PERFORMED AS A PREPARATION FOR PHAKIC INTRAOCULAR LENS IMPLANTANTION

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Purpose

Laser iridotomy is a common treatment performed in angle-closure glaucoma patients. It is also performed in high myopia patients as a preparation for phakic intraocular lens (IOL) implantation. Although it is a rather common procedure, unexpected complications such as endothelial cell damage, cataract formation, intraocular pressure spike and iris tissue-related complications may occur. We would like to introduce a case report of posterior subcapsular cataract formation after laser iridotomy performed as a preparation for phakic IOL implantation in a high myopia patient.

Methods

A 23-year-old male patient with high myopia received laser iridotomy for preparation of phakic IOL surgery. Laser setting was 500 μm spot size, 0.5 sec duration, 100 mW power for argon laser contraction and 50 μm spot size, 0.02 sec duration, 1000 mW power for argon laser punch. YAG laser setting was 3.4 mJ. In this particular patient, posterior subcapsular cataract occurred in both eyes after laser iridotomy, and patient's best corrected vision was 0.5 in the right eye and 1.0 in the left eye. Fourteen days after laser iridotomy, cataract surgery was performed on the right eye. Regarding the patient's young age, tri-focal lens (AT Lisa tri 839MP) was inserted for improvement of far and near vision.

Results

Patient's vision recovered to 1.0 at near and far on POD 1, and during 12 months of follow-up, visual acuity was stable and IOL location was perfectly intact. Although

posterior subcapsular cataract also noted on the left eye corrected vision was 1.0 and the patient preferred close follow-up for the time being.

Conclusion

Although the patient is under stable condition, extra caution should be taken in laser iridotomy procedures for patients preparing for phakic IOL surgery. Also, explanation of possible complications before treatment is mandatory.

SURGICAL MANAGEMENT OF SECONDARY GLAUCOMA AFTER RHEGMATOGENOUS RETINAL DETACHMENT SURGERY IN A POSTPARTUM YOUNG WOMAN USING AN ANTERIOR CHAMBER TUBE SHUNT TO AN ENCIRCLING BAND: A CASE REPORT

Malgapu-uy M[1]

Introduction

We present a case of silicone oil glaucoma from previous retinal surgery with encircling band managed by using a modified Schocket technique using a G23 lacrimal stent to the encircling band.

Methods

Case report.

Results

A 31-year-old underwent pars plana vitrectomy with silicone oil injection with encircling band for a rhegmatogenous retinal detachment of the right eye. Medical management for the post-operative IOP elevation initially offered good control. Due to pregnancy, a reduction to brimonidine monotherapy was done which yielded inadequate IOP control. Oil emulsification was noted on gonioscopy however surgical intervention was delayed due to foetal concerns. Oil removal with phacoemulsification were done with reinsertion of oil tamponade due to inferior retinal re-detachment. Post-operatively, with maximum medical therapy, IOP was at high 20s with emulsified oil present on gonioscopy. An anterior chamber shunt to an encircling band (modified Schocket technique) procedure was done and provided good IOP control even after 9 months post-operation with one session of repriming done.

Conclusion

Management of secondary glaucoma in pregnant and lactating patients remain to be a complicated process which eventually may require surgical intervention. In patients requiring placement of a glaucoma drainage device but have an unfavourable conjunctival anatomy from previous retinal and encircling band placement surgeries, revisiting the anterior chamber tube shunt to an encircling band using the modified Schocket technique is a viable option.

COMPREHENSIVE ANALYSIS OF HYPOTONY AND CHOROIDAL DETACHMENTS IN EYES WITH POST TRABECULECTOMY WITH MITOMYCIN -C: AN OVERVIEW

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Introduction

Ocular hypotony and early choroidal detachments (CD) post trabeculectomy with MMC surgery has been associated with increased risk of trabeculectomy failure. Evaluating clinical profile, Management approaches, and visual outcomes of hypotony and CD in eyes following trabeculectomy with mitomycin C(MMC).

Methods

Retrospective analysis of data of 1,097 patients over a period of 1 year and 4 months with hypotony and CD following trabeculectomy with or without cataract surgery

Results

Out of 1097 patients 44 patients with hypotony and CD following trabeculectomy with MMC were included. The mean age was 60.76 ± 14.77. In this study, 22 eyes (50%) were patients of primary angle-closure glaucoma, 14 eyes (31.8%) were primary open-angle glaucoma, 3 eyes (6.8%) of juvenile glaucoma. Nineteen eyes (43.2%) had CD following hypotony. Mean duration of hypotony from surgery was 7.8 weeks. Based on visual fields Mean Deviation (> -20.1) 21 eyes (47.7%) had severe glaucoma. The mean preoperative intraocular pressure (IOP) and hypotony IOP difference was 17.75 ± 11.68, which was statistically significant ($p < 0.005$).The mean axial length of 42 eyes was 23.18 ± 1.11 (95.5%).Out of 44 eyes, 10 eyes (22.7%) had a positive Seidel's test with brisk leak of which 8 eyes (18.2%) required bandage contact lens application, 2 eyes had undergone conjunctival suturing, 1 anterior chamber reformation with scleral flap suturing, 2 required scleral patch graft. Among 19 eyes of CD, 12 eyes (27.3%) required oral steroids, 1 eye had undergone choroidal drainage, and 1 eye had vitreoretinal surgical intervention. Seventeen

eyes of the hypotony patients recovered only with conservative management requiring no further intervention. At 6 months follow-up, 13 eyes (30.9%) required antiglaucoma medications for good IOP control, suggesting unfavourable trabeculectomy outcome.

Conclusion

Hypotony and CD following trabeculectomy with MMC has an impact on visual acuity. Preoperative IOP and severity of glaucoma have a role in anticipating postoperative hypotony and CD. There's a correlation between CD and unfavourable trabeculectomy outcomes requiring increased use of antiglaucoma medications.

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2. Impact of postoperative choroidal detachment on trabeculectomy outcomes: a four-year comparative study Maryam Yadgari[1,2], Mohammad Javad Ghanbarnia BMC Ophthalmol 2023
3. Is post-trabeculectomy serous choroidal detachment a risk factor for failure in the long term Maryam Yadgari[1,2], Kiana Hassanpour[2,3], Nader Nassiri https://pubmed.ncbi.nlm.nih.gov/33241718/Eur J Ophthalmol 2022 Jan

FIVE-YEAR COST COMPARISON OF ISTENT INJECT® W VS. TRABECULECTOMY VS. MEDICATIONS FOR OPEN-ANGLE GLAUCOMA WITH PHACOEMULSIFICATION: ANALYSIS FROM THE FILIPINO PATIENTS' PERSPECTIVE

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[1]St. Luke's Medical Center Global City, [2]Glaukos Singapore PTE LTD, [3]ANSEA Consultants

Background and Rationale

In addition to risks and benefits of treatments, long-term costs should be factored into surgeon-patient shared decision-making for chronic diseases.[1] Five-year total direct medical costs of iStent Inject W, a microinvasive glaucoma surgical implant; trabeculectomy, an invasive surgical gold standard; and medication for the treatment of open-angle glaucoma (OAG), in combination with phacoemulsification, were estimated from the perspective of Filipino patients.

Methods

Unit costs and frequency data for consultation with basic eye exams, primary glaucoma surgery, and post-operative interventions were acquired through primary research. Glaucoma medication costs and frequencies were sourced from published data.[2-8] Unit costs and frequencies for secondary glaucoma surgery, were derived from both primary and secondary data.[3] Scenario analysis encompassed patients paying 100% out of pocket, those eligible for government subsidy, and individuals covered by private insurance.

Results

Over 5 years, iStent Inject W with phacoemulsification compared with medication with phacoemulsification will result in a patient saving between US$3,895 and US$4,127. Over 5 years, iStent Inject W with phacoemulsification will cost a patient US$92–US$1,395 more than trabeculectomy with phacoemulsification. Patients

incur considerably lower costs with iStent Inject W than medications. Both patients paying out-of-pocket and those eligible for government subsidy experience comparable 5-year costs between iStent Inject W and trabeculectomy. Patients with private insurance experience a cost difference lower than the average iStent Inject W device cost.

Conclusion

Surgeon-patient decisions should factor in long-term costs, along with risks, benefits, and quality of life and not just initial surgical expenses.

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THE EFFICACY OF WICK RELEASABLE SUTURE (WIRES) IN PREVENTING AN EARLY HYPERTENSIVE PHASE POST AUROLAB AQUEOUS DRAINAGE IMPLANT (AADI)

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Introduction

Glaucoma drainage device (GDD) implants are known for surgical management for refractory glaucoma. Aurolab Aqueous Drainage Implant (AADI) is a cost-effective non-valved GDD. It has a relatively good standard quality as other models. Hypertensive phase or unchanged preoperative high intraocular pressure (IOP) is common in immediate post-operative of non-valved GDD implantation. This phase will persist until absorption of the extraluminal ligation of vicryl suture at 6 to 8 weeks postoperatively. WiReS is a nylon 10-0 suture that passes through the clear cornea followed by a wick at the tube before the point of extraluminal vicryl suture ligation and intraluminal stenting. This will allow percolation of the aqueous through the small hole at the tube which maintained by the wick suture. Hence, it reduces and controls the IOP at the early post-operative period.

Methods

This is a retrospective observational study of patient's data who underwent AADI operation from July 2021 until June 2023. The surgery was performed by a single glaucoma specialist with WiReS technique. Preoperative IOP and number of antiglaucoma medications (AGM), postoperative day 1, week 1, 4, 8, 12, and 24 were recorded.

Results

A total number of 34 eyes were included. Secondary open angle was the main type of glaucoma (52.9%). Majority of the patients were diagnosed with severe stage

(64.7%). The mean IOP prior to surgery was 29.09 which reduced to 14.26 at postoperative day 1. Similarly, the mean numbers of AGM reduced from 4.85 to 1.18.

Conclusion

WiReS technique is a safe and proven to reduce IOP at the early phase post-AADI surgery. It results in an instantaneous effect of normalized IOP along with discontinuation of AGM.

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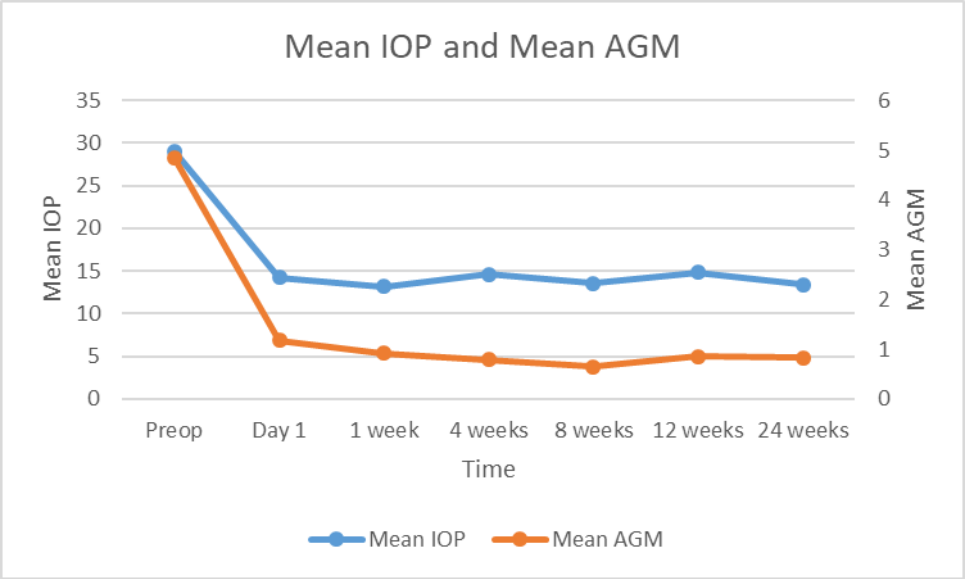
Tables, Figures, and Illustrations



OUTCOMES OF TRABECULECTOMY SURGERY IN SUDAN

Mohamed M[1], Bigirimana D[2,3], Atik A[2], Skalicky S[2,3,4], Green C[2]

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Introduction

Trabeculectomy involves the creation of a fistula connecting the anterior chamber and the subconjunctival space.[1] This provides an alternative method of aqueous humour filtration when the natural trabecular outflow pathway is blocked or poorly functioning in cases of glaucoma. The goal is to create the right amount of flow without causing overfiltration.

Objective

To evaluate the outcomes of trabeculectomy surgery in glaucoma patients living in Sudan.

Methods

A retrospective chart review of patients that underwent trabeculectomy surgery with mitomycin C. Releasable sutures were removed 2-4 weeks following the surgery, with patients reviewed at D1, W1, W4, and 3 Months. Atropine 1% was used post operatively for one week. Data recorded included demographics, Intraocular pressure (IOP), best-corrected visual acuity (BCVA), the number of medications at baseline and 3 months postoperatively.

Results

27 patients with mean age of 53.8 ± 12.40 years were included in the study. The commonest region of origin was Khartoum (n = 18, 60%) followed by Om Durman and Port Sudan (n = 3, 10%) each. At baseline, BCVA was counting fingers (CF) or less

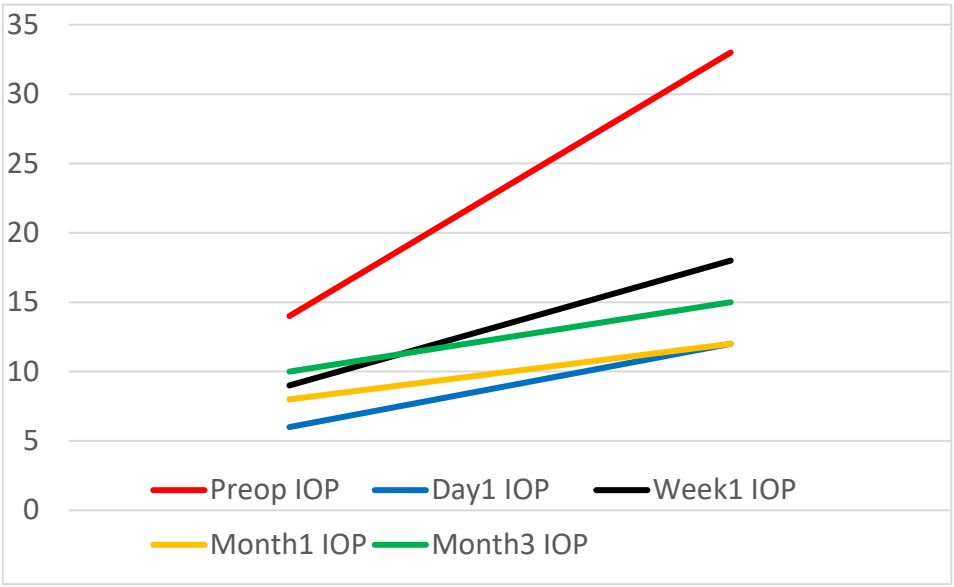
in 7 % and 37% of operated and fellow eyes, respectively. Mean (± SD) IOP at baseline was 23.83 (9.01); reduction at 1 month and 3 months following surgery was 53 ± 16% and 43 ± 21%, respectively, with 22 patients (73%) free of using glaucoma drops at 3 months. Six cases (20%) developed cataract following trabeculectomy surgery.

Conclusion

Trabeculectomy is an effective IOP-lowering procedure despite the complexity and the severity of glaucoma patients in Sudan.

Tables, Figures, and Illustrations

Figure 1. Pre- and postoperative intraocular pressure.



BILATERAL IRIDOCORNEAL ENDOTHELIAL SYNDROME PRESENTING AS ESSENTIAL IRIS ATROPHY VARIANT WITH SECONDARY GLAUCOMA IN A 33-YEAR-OLD FEMALE: A CASE REPORT

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Introduction

Iridocorneal endothelial (ICE) syndrome is a rare condition characterised by abnormalities of the corneal endothelium, progressive iris anomalies, and iridocorneal angle obstruction that can cause secondary glaucoma. It comprises a spectrum of three variants: iris nevus syndrome, Chandler syndrome and essential iris. This case report aims to present a rare case of ICE syndrome with secondary glaucoma, its ocular findings, causes, possible complications and management strategies, as well as to emphasize the advantages of using diagnostics and imaging techniques to aid in diagnosing ICE syndrome.

Methods

A 33-year-old female consulted due to blurring of vision with complaints of photophobia and abnormally shaped pupils in both eyes. Diagnostics were done such as slit-lamp Examination, specular microscopy, OCT of macula and ONH, perimetry, and AS-OCT with clinical follow-up visits.

Results

During initial evaluation, slit-lamp examination revealed corectopia, polycoria, and iris atrophy. Intraocular pressure was 18 mmHg in the right eye and 16 mmHg in the left eye with 360-degree peripheral anterior synechiae and extensive obstruction of the trabecular meshwork on gonioscopy and AS-OCT. Fundoscopy showed increased cup-to-disc ratio of 0.9 on both eyes. Central corneal thickness was 454 µm on the right eye and 477 µm on the left eye. Diagnosis of essential iris atrophy with secondary glaucoma was made. Patient was started on antiglaucoma

medication and on being followed showed minimal reduction of pressure on both eyes.

Conclusion

Early diagnosis is helpful to better manage ICE syndrome and its complications which necessitates participation of cornea and glaucoma specialists due to its challenging nature. Ocular findings supported by Imaging techniques used to confirm the diagnosis, with additional test like AS-OCT, were seen to be helpful in managing and monitoring cases and may be beneficial in preventing further progression and complications of ICE syndrome.

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Tables, Figures, and Illustrations

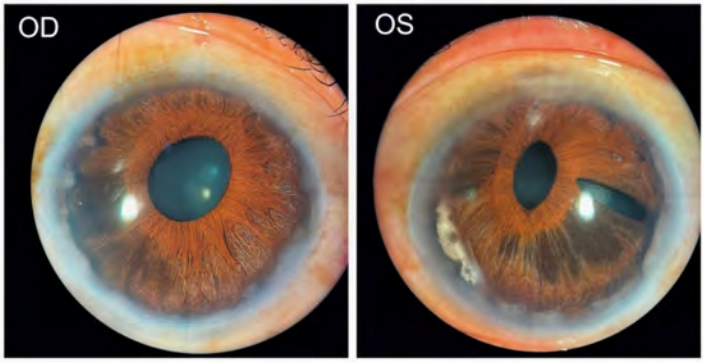

Figure 2. Slit-lamp examination showing corectopia, polycoria, iris atrophy, and multiple 360° PAS.

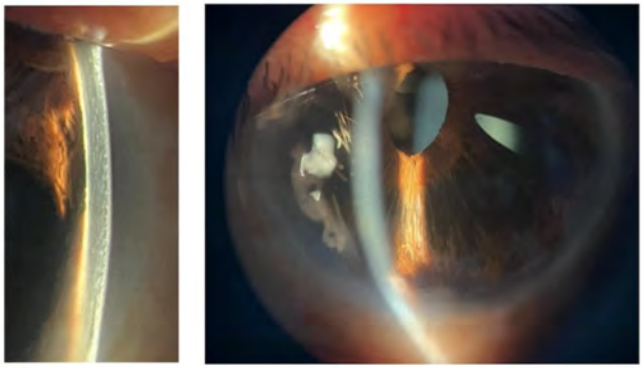

Figure 2. "Hammered silver" appearance of the cornea.

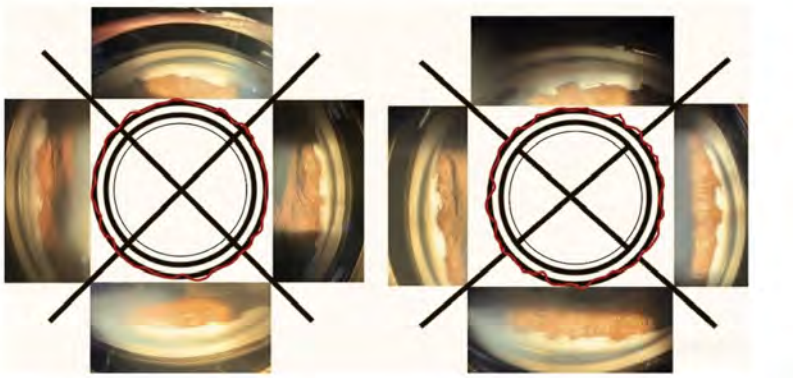

Figure 3. Gonioscopy: presence of high, 360°peripheral anterior synechiae with extensive obstruction of the trabecular meshwork in both eyes.

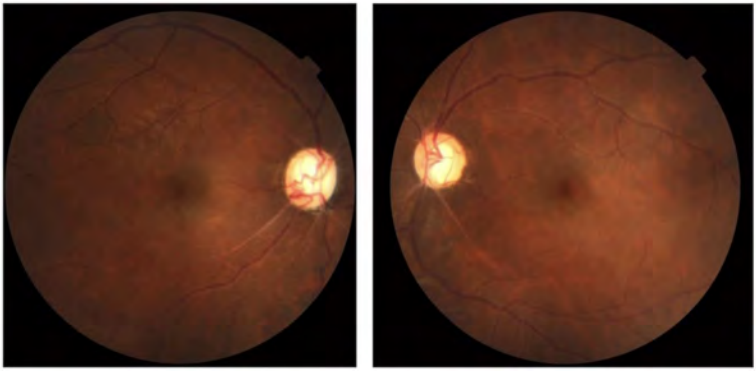

Figure 4. Fundoscopy showing increased cup-to-disc ratio.

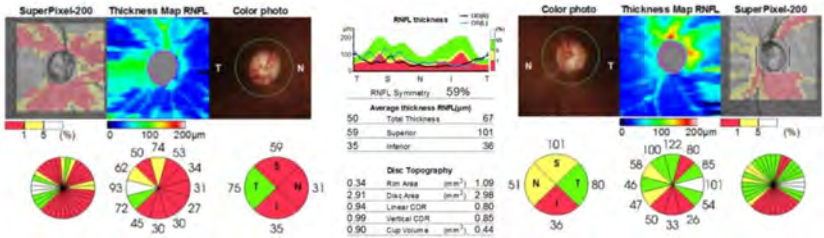

Figure 5. OCT of the optic nerve head showing marked loss of RNFL fibres in both eyes.

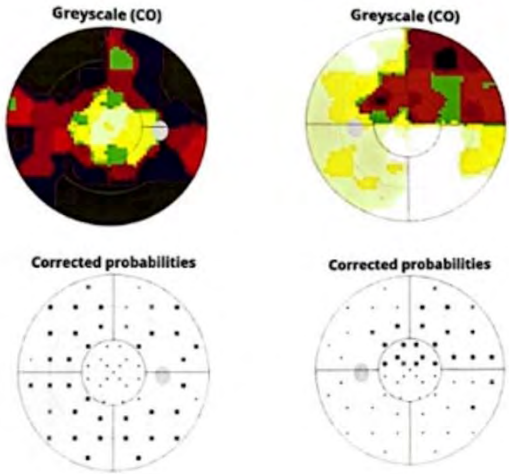

Figure 3 **Perimetry showing Glaucomatous changes**

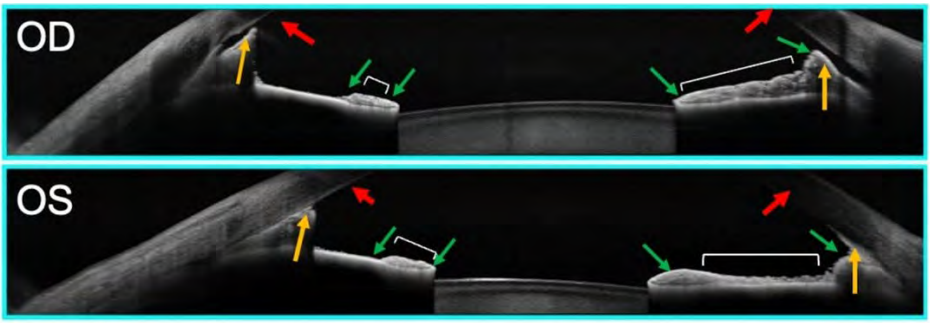

Figure 7. AS OCT (OD) angle showing high PAS with reflective tissue layer on the iris; (OS) Angles showing high PAS (orange arrows). Corneal endothelium (red arrows) continuous with reflective tissue layer on the iris surface (white).

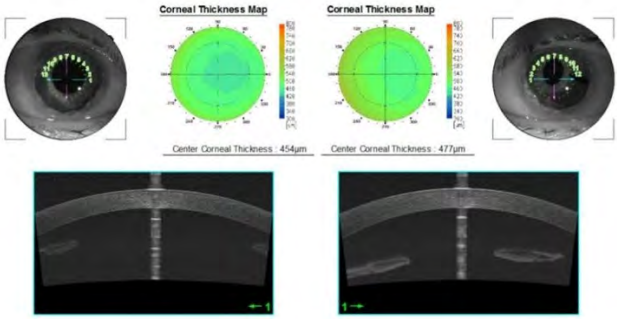

Figure 8. CCT of 454 um in the right eye and 477 um the left eye.

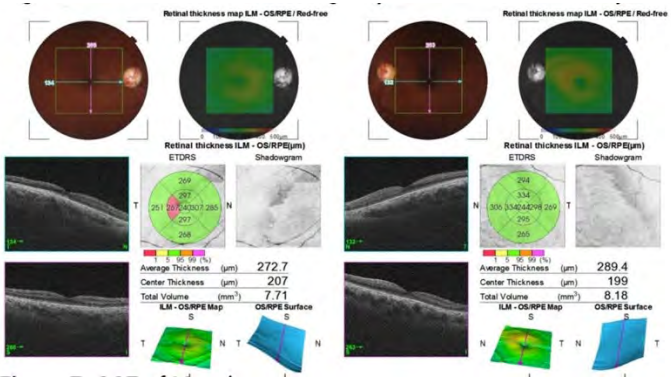

Figure 9. OCT of macula.

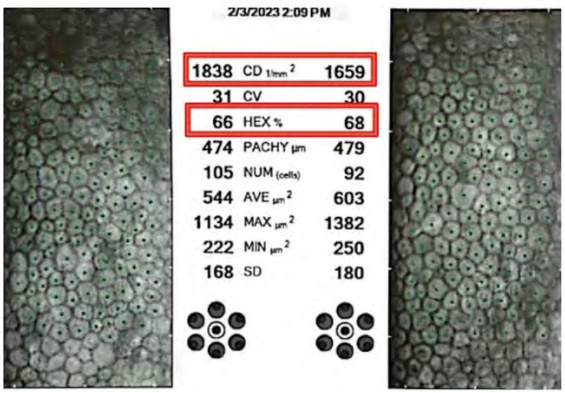

Figure 10. Specular microscopy.

TWO CASES OF AQUEOUS MISDIRECTION FOLLOWING IMPLANTATION OF PRESERFLO MICROSHUNT

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Introduction

To describe a case series of aqueous misdirection (AM) following implantation of Preserflo MicroShunt (PMS) in patients with pseudoexfoliation glaucoma (PEG)

Methods

An 84-year-old Japanese female (case 1) and an 87-year-old Japanese male (case 2) with medically uncontrolled PEG, whose preoperative intraocular pressure (IOP) were 26 mmHg (case 1) and 39 mmHg (case 2) under maximal medication, were performed uncomplicated implantation of mitomycin C (MMC) augmented PMS.

Results

On postoperative day 1 (POD1) after the implantation of PMS, both cases presented hypotonic (case 1; 3 mmHg, case 2; 6 mmHg), deep anterior chamber (AC), and mild filtering bleb without any leakage. In the early postoperative period (case 1; POD4, case 2; POD3), both patients developed aqueous misdirection without any signs of choroidal effusion or haemorrhage. Conventional treatment with aqueous suppressants and atropine 1% proved ineffective, and the IOP increased significantly high when the inlet of the PMS was completely occluded with the iris (case 1; 58 mmHg, case 2; 19 mmHg). Surgical irido-zonulo-hyaloidectomy in combination with anterior vitrectomy (IZHV) were performed though peripheral corneal side port. On the next day, the AC was formed in both cases, and the inlet obstruction of the PMS were resolved. Unfortunately, case 1 developed further recurrence of AM, which was eventually resolved by a subsequent glaucoma surgery (trabeculectomy) in conjunction with wider vitrectomy. Subsequently, both cases

remained stable, with deep AC. Case 1 kept a functioning bleb from trabeculectomy with IOP of 11 mmHg without any topical IOP-lowering agent, while case 2 kept a bleb of PMS with IOP of 13 mmHg after the initial IZHV.

Conclusion

The management of aqueous misdirection after PMS implantation and its subsequent clinical course is similar to cases due to other causes, except for marked IOP elevation with iris-related tube obstruction when the AC is shallow.

COMPARISON OF SHORT-TERM OUTCOMES OF ND: YAG VERSUS ND: YVO SELECTIVE LASER TRABECULOPLASTY FOR OPEN ANGLE GLAUCOMA IN A PRIVATE EYE CENTER IN THE PHILIPPINES

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Introduction

The Laser in Glaucoma and Ocular Hypertension (LiGHT) trial demonstrated that Nd:YAG-selective laser trabeculoplasty (Nd:YAG-SLT) is effective as first-line treatment for elevated intraocular pressure (IOP) for open-angle glaucoma (OAG). Recently, the VISULAS® green frequency-doubled Nd: yttrium orthovanadate SLT (Nd: YVO4 SLT) was introduced utilizing 52 equally divided doses per shot. This study compared the short-term outcomes of Nd:YAG and Nd:YVO4 SLT treatment in a private eye centre in the Philippines.

Methods

Charts of Nd:YAG and Nd:YVO4 SLT-treated eyes with primary and secondary OAG performed by a single surgeon from 2022–2023 were reviewed. Existing medications were unchanged and treatment-naïve patients were included. IOP was measured at baseline then one, three, and six months after SLT. Records with incomplete data were excluded from the analysis. Paired t-test and the Kaplan-Meier survival estimate were used to analyse the results.

Results

Sixty eyes (30 Nd:YAG and 30 Nd:YVO4) were included. Ages were comparable between the two groups. More females were included in the Nd:YAG group whereas there were equal genders in the Nd:YVO4 group.

At baseline, the IOPs for each group (Nd:YAG/Nd:YVO4) were 22 mmHg and 21.73 mmHg respectively. Comparing from baseline, the change in mean IOP after treatment (Nd:YAG/Nd:YVO4) were: 1 month [17.93 mmHg (-4.07)/18.73 mmHg (-3.0), p = 0.44], 3 months [17.43mmHg (-4.06)/17.33 mmHg (-4.4), p = 0.95], and 6 months [17.27 mmHg (-4.73)/17.31 mmHg (-4.22), p = 0.82]. Kaplan-Meier estimates showed a 20% IOP drop at 6 months, specifically in 53% and 44% of eyes treated with Nd:YAG and Nd:YV04 groups, respectively.

Conclusion

This study showed comparable IOP-lowering in both SLT modalities. Technological enhancements introduced through the Nd:YVO4 platform may provide a more uniform delivery and accurate spot placement. Long-term studies are needed to establish its utility in glaucoma treatment.

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LIGHT PIPE ASSISTED TRABECULECTOMY IN IDENTIFICATION OF LANDMARKS IN A PEDIATRIC BUPHTHALMIC EYE: A NOVEL SURGICAL APPROACH

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Introduction

Primary congenital glaucoma (PCG) is characterized by globe enlargement, increase in corneal diameter, optic nerve cupping, and stretching of the corneoscleral limbus due to prolonged exposure to elevated IOP.[1-4] The definitive surgical management includes trabeculectomy that involves identification of the limbal structures in order to position the sclerostomy accurately.[7-9] However, the wide limbus and indistinct anatomy may contribute to intraoperative injury to the ciliary body leading to serious complications.[10-13] We present a novel technique that may aid the surgeon in identifying surgical landmarks among buphthalmic eyes.

Methods

During the trabeculectomy procedure in this patient with buphthalmos and a wide stretched limbus, a G 23 light pipe was used to carefully delineate the corneoscleral landmarks and identify the ciliary body area apart from clear cornea and sclera.

Results

The use of light pipe side lighting aided in creating the sclerostomy anterior to the surgical limbus in this patient with distorted limbal anatomy. This avoided inadvertent injury to the ciliary body that may lead to unnecessary bleeding and vitreous loss.

Conclusion

The use of the light pipe in trabeculectomy among buphthalmic eyes presents a new option to safely delineate surgical landmarks in eyes with stretched and distorted corneoscleral limbal anatomy.

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Figures

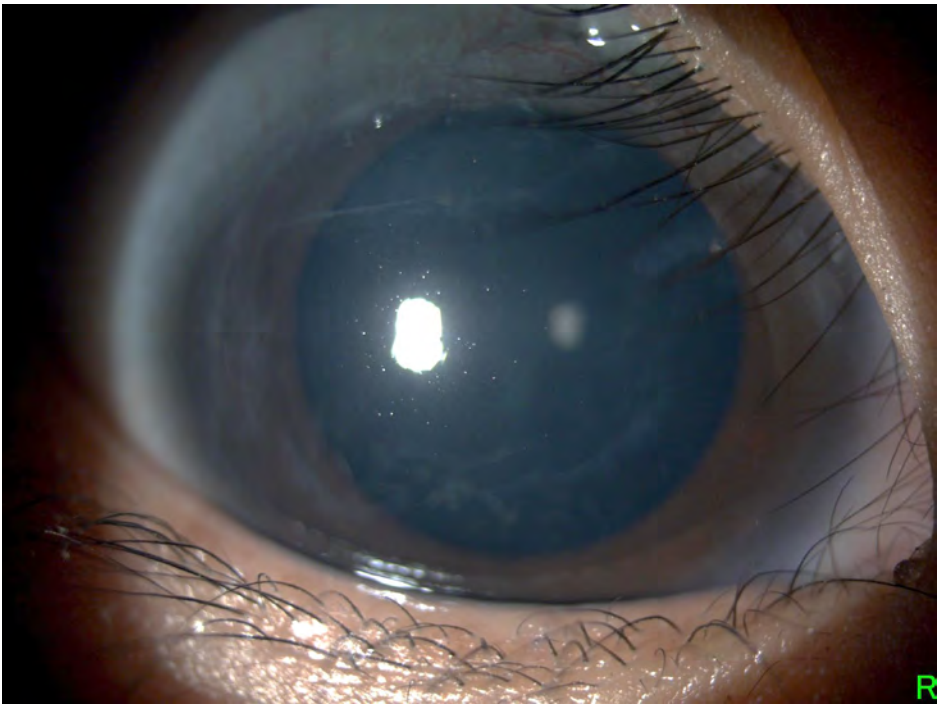

Figure 1. Buphthalmic right eye with horizontal to oblique Haab's striae.

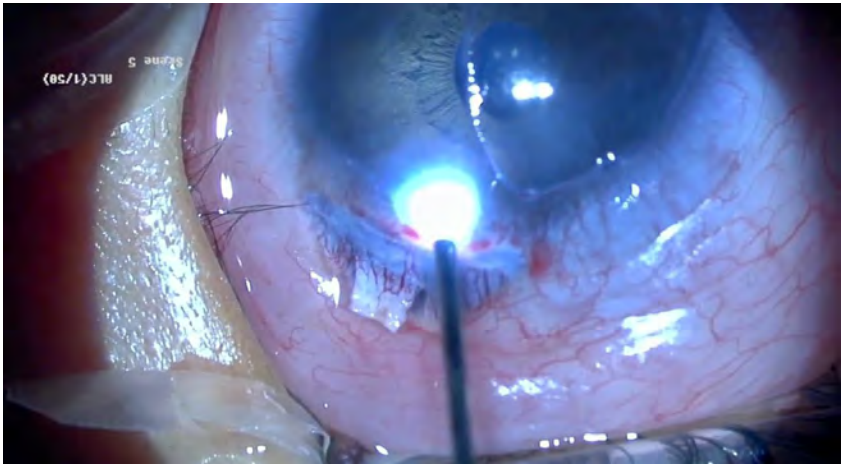

Figure 2. Light pipe held directly against the clear corneal surface; the iris structures are visible.

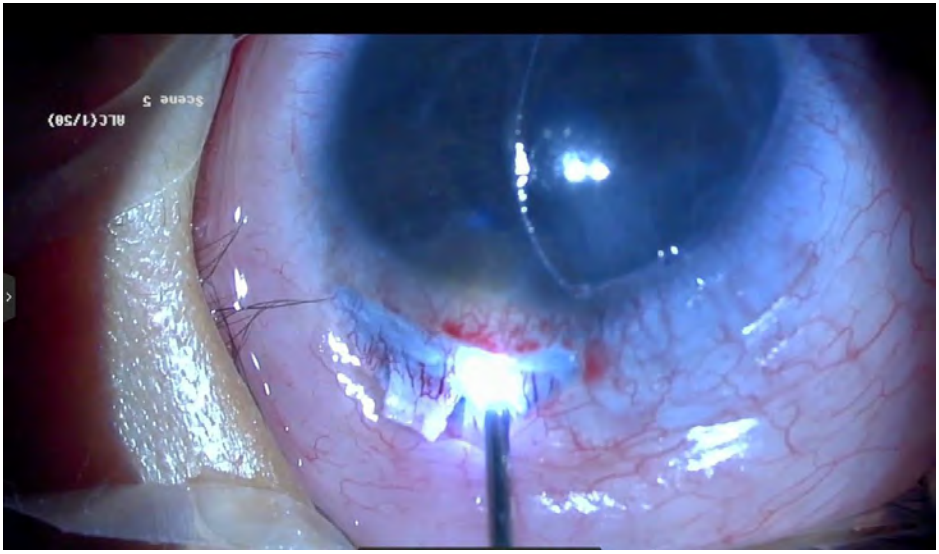

Figure 3. Light pipe placed more posteriorly.

MANAGEMENT OF AQUEOUS MISDIRECTION SYNDROME

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Introduction

Aqueous misdirection syndrome (AMS) is an uncommon secondary glaucoma that can be potentially blinding if not treated adequately. The treatment is challenging and requires combination of medical, laser and surgical therapy.

Methods

Case series

Results

We report presentation and management of 4 cases of AMS seen between September 2023 to January 2024 in our centre. All patients were of Chinese ethnicity with equal male-to-female ratio. Age range was 67–83 years. All patients were pseudophakic and had unilateral presentation of anterior chamber shallowing grade 2–3 with IOP ranging from 25–45 mmHg. Three patients had patent peripheral iridotomy. Two patients developed the condition after trabeculectomy, and the other 2 developed it spontaneously. All patients were started on gutt atropine 1% BD and topical antiglaucoma medications. All required further treatment with laser therapy. One patient had Nd:YAG iridozonulohyaloidotomy (IZH) alone, 1 patient had Nd;YAG capsulohyaloidotomy (CH) alone, and 2 patients had both IZH and CH done. The condition was successfully reversed in 3 patients, with them achieving deeper anterior chamber and IOP ranging between 8–16 mmHg. One patient had improved anterior chamber depth; however, the IOP was still high owing to the 360-degree peripheral anterior synechiae from chronic shallow anterior chamber. This patient subsequently underwent trabeculectomy and Nd:YAG vitreolysis at the site

of previous IZH. Following this, the anterior chamber deepened relatively and IOP became 10 mmHg.

Conclusion

These cases highlight the successful management of AMS with gutt atropine and laser therapy aimed at disrupting anterior vitreous (CH) and creating a conduit between posterior segment and anterior segment (IZH) that redirects misdirected aqueous.

ANGLE CLOSURE SECONDARY TO PHAKIC AC-IOL IMPLANTS MANAGED WITH XEN GEL IMPLANTATION

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Introduction

This case report describes the successful use of a XEN Gel Stent in controlling intraocular pressure (IOP) following secondary angle closure due to the AcrySof Cachet without explanting the lens and preserving its refractive results.

Methods

A 50-year-old male bilaterally implanted with Cachet IOLs in 2010 with no perioperative problems presented with elevated IOP in both eyes 10 years later on multiple glaucoma medications. UCVA was 20/20 and 20/30 in the right and left eye, respectively. Gonioscopy showed angle closure of almost the entire angle possibly from intermittent rotation of the IOLs. Endothelial cell counts were good in both eyes; mild cupping and an arcuate scotoma were noted in the left eye. It was deemed unnecessary to explant the IOLs and the Xen implants were placed without any variation in surgical technique.

Results

This case shows that the XEN Gel Stents were able to adequately manage IOP post-operatively and on regular follow-up visits for over 3 years following the implantation of the device. UCVA was preserved with no refractive changes and endothelial cell density remains the same. No glaucoma medications have been necessary with IOPs ranging from 10–15 mmHg. The arcuate scotoma in the left eye improved postoperatively after 3 months.

Conclusion

While the Cachet lenses have been withdrawn from the market due to mainly to concerns of progressive endothelial cell loss, there are sparse reports about the management of the patients who have had the implants and have not required explanation. This is an unusual case of the progressive closure of the angle from slow rotation of the Cachet lens and the successful management for the past 3 years using the XEN implant.

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BIMATOPROST CAN IMPROVE EYELID FULLNESS AND EXOPHTHALMOS IN THYROID EYE DISEASE

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Introduction

Bimatoprost is a synthetic prostamide analogue indicated for treatment of glaucoma. Recognised side effects include periorbital fat atrophy and eyelash growth. Thyroid eye disease (TED) is first-line symptomatically treated with ocular lubricants. Exophthalmos is treated with steroids, orbital surgery, or radiation. Whilst bimatoprost is often used off-label for treatment of hypotrichosis, it has not yet been reported for use in thyroid eye disease.

Methods

A 69-year-old Caucasian woman with a 22-year history of open-angle glaucoma, fibromyalgia, Meniere's disease, and metastatic invasive ductal carcinoma of left breast in remission, was treated with various eyedrops including Timoptol XE, Alphagan, Betoptic S. Bilateral inferior selective laser trabeculoplasty (SLT) was performed in 2006 to success, controlling intraocular pressures. In 2019, she was diagnosed with autoimmune thyroiditis. For her exophthalmos she was started on mycophenolate and required pulse IV methylprednisolone. She developed shingles and noting her breast cancer history, these immunosuppressive agents were ceased by her endocrinologist.

Her IOP in both eyes peaked to 24 mmHg, and her symptoms of exophthalmos, diplopia and eyelid fullness worsened. SLT was repeated for both eyes in 2021, and she was resumed on Xalatan which did not lower IOP sufficiently. This was changed to Ganfort (bimatoprost + timolol) in September 2022.

Results

At 2-month follow-up, IOP was controlled in both eyes (R 19 mmHg and L 18 mmHg). At 4 months, there was notable reduction in periorbital fat swelling of upper lid as noted in photos. The patient reported that her symptoms of diplopia, exophthalmos and eyelid fullness had improved.

Conclusion

This case demonstrates that using bimatoprost to treat glaucoma in a patient with thyroid eye disease helped improve symptoms of diplopia, exophthalmos, and eyelid fulness. This suggests that bimatoprost can be used off-label to treat symptoms of thyroid eye disease in patients who do not have glaucoma.

THE WRATH OF STEVENS-JOHNSON SYNDROME: A CONTINUUM OF OCULAR COMPLICATIONS

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Introduction

Ocular Steven Johnson syndrome (SJS) is a rare severe inflammatory disorder with widespread mucocutaneous involvement attributed to delayed hypersensitivity. Corneal keratinization necessitates implantation of devices including keratoprosthesis (KPro) and glaucoma drainage devices (GDD). Complications include anterior segment inflammation, tissue disruption, optic neuritis, and uveitis from biomechanical and autoimmune damage, with infection and medications triggering flares.

Methods

This paper presents a case of ocular SJS with Boston KPro and GDD, who developed optic neuritis and uveitis following COVID-19 infection, for which she is recalcitrant to steroids, and discuss the approach to diagnosis and management.

Results

A 55-year-old female with bilateral ocular SJS underwent Boston KPro and GDD implantation in the right eye. She developed COVID-19 infection, then noted gradual progressive blurring of vision on the right from 20/70 to 20/150. Optic neuritis was noted. 5-day pulse IV methylprednisolone was given, improving BCVA to 20/40. Gradual taper of 1 mg/kg/day prednisone was done. While off steroids, she had an episode of eye redness with blurring of vision and flare of optic neuritis. Vision on the right dropped to 20/100, with increased floaters and scleritis. High dose oral prednisone was started, where improvement was noted. On slow taper to 60 mg/day, vision worsened to light perception, and was assessed with anterior and intermediate uveitis, both eyes with optic neuritis recurrence, right eye.

Rheumatologic workups were negative. Sub-Tenon injection of steroids done. Methotrexate and higher dose of steroids were started. Improvement to 20/40 was noted. However, the left eye had a sudden episode of uveitis with an increase in intraocular pressure. Implantation of GDD was done in the left eye, with stabilization of intraocular pressure.

Conclusion

Ocular SJS with Boston KPro and GDD, alongside optic neuritis and uveitis, poses unique challenges. SJS, an autoimmune disease, can evolve with purely ocular symptoms. Multidisciplinary approach is crucial to optimise outcomes.

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Tables, Figures, and Illustrations

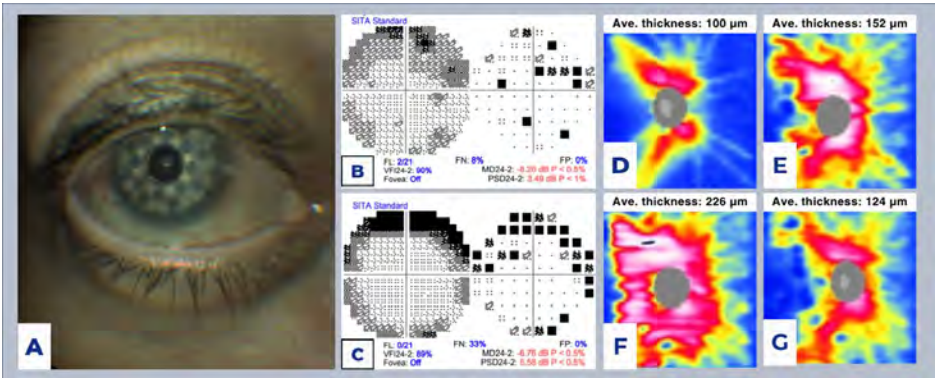

Figure 1. (A) Gross picture of the right eye with Boston KPro and GDD taken May 2022. Perimetry of the right eye (B) post-Boston KPro and GDD - May 2022. (C) Post-COVID-19 infection - Dec 2022. RNFL thickness map of the right eye (D) post-Boston KPro and GDD implantation - Mar 2022. (E) Post-COVID-19 infection - Dec 2022. (F) Post-eye redness episode - Apr 2023. (G) Post-uveitis - Jul 2023.

MODIFIED ANTERIOR CHAMBER TUBE SHUNT TO AN ENCIRCLING BAND (ACTSEB) GLAUCOMA PROCEDURE: SURGICAL TECHNIQUE AND RESULTS: A CASE SERIES

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Purpose

To evaluate the clinical outcomes of a modified anterior chamber tube shunt to encircling band (ACSTEB) procedure in eyes with increased intraocular pressure (IOP) despite maximal tolerated medical therapy after scleral buckling procedure for treatment of retinal detachment. To describe the surgical method done in modified ACTSEB procedure.

Methods

Design: Retrospective, non-comparative, interventional case series.
Inclusion criteria: Patients who underwent modified ACTSEB surgery by glaucoma fellows at the Department of Health Eye Centre, East Avenue Medical Centre from 2017 to 2020.

Procedure

Case records were reviewed for demographic data. Outcomes included were IOP, duration of postoperative follow-up, and postoperative complications.

Primary outcome measures

Postoperative IOPs of > 6 mmHg and < 21 mmHg with or without antiglaucoma medications (AGMs).

Data analysis

Descriptive statistics presented are mean and range.

Results

Mean preoperative IOP was 37 mmHg (range, 34 to 45 mmHg) under maximum tolerated medical therapy. Mean IOP at day 1 postoperative was 18.5 mmHg, 15.5 m Hg at 1 month, and 11 mmHg on the last follow-up. Range of IOP on the last consult was 8 to 18 mmHg. Follow up duration ranged from 9 to 35 months. Three out of the 6 eyes were started on anti-glaucoma medications. Intraocular pressure remained less than 21 mmHg in all cases. Complications were hypotony maculopathy, shallow anterior chamber, tube migration and tube blockage. One case had inferior tube migration and underwent tube repositioning at 20 months postop. One case had a shallow anterior chamber. One case had hypotony maculopathy and 3 cases had tube blockage by silicon oil. There was no tube exposure on all cases.

Conclusion

Modified ACTSEB proved to be a viable treatment option for elevated IOP, despite maximal glaucoma medical therapy, in eyes with encircling bands for retinal surgery. The results suggest the procedure provided good IOP control and few complications.

PERIPAPILLARY MICROVASCULAR PARAMETERS IN UNILATERAL OPEN-ANGLE GLAUCOMA USING THE OPTICAL COHERENCE TOMOGRAPHY-ANGIOGRAPHY

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Introduction

Among the various proposed mechanisms of glaucoma pathophysiology, evidence supports the vascular theory leading to progressive RGC degeneration and death. This study compared the peripapillary retinal nerve fibre layer (pRNFL) microangiographic properties [vessel area density (VAD) and blood flux index (BFI)] of unilateral primary open-angle glaucomatous (POAG) eyes to contralateral eyes-at-risk, and to eyes of healthy age and sex-matched subjects. By looking into the microvascular parameters of the eyes, we may detect clues, details, or patterns that can serve as markers in early detection of structural changes, even prior to RGC degeneration, irreversible optic nerve damage, and VF loss.

Methods

This was a single-centre, case-control study of Filipinos diagnosed with unilateral POAG or normal-tension glaucoma (NTG). Mean overall and quadrantal VAD and BFI of the three groups were measured with optical coherence tomography-angiography (OCT-A). Area under the receiver operating characteristic (AROC) was used to measure diagnostic ability.

Results

Twenty-two glaucomatous subjects (15 POAG and 7 NTG eyes), 22 contralateral eyes-at-risk, and 22 normal eyes from age- and sex-matched control subjects completed the study. Eyes with glaucoma showed lower mean overall VAD (40%) and BFI (0.37) compared to eyes-at-risk (44.4% and 0.42, respectively; $p < 0.001$) and control eyes (45.6% and 0.44, respectively; $p < 0.001$). Mean VAD and BFI values of

eyes-at-risk and control groups did not significantly differ from each other. Overall pRNFL thickness showed highest diagnostic accuracy for glaucoma (AROC = 0.97), followed by VAD (0.94), and BFI (0.88) (p = 0.46).

Conclusion

VAD and BFI were significantly diminished in unilateral open-angle glaucoma, suggesting that the utility of OCT-A in the detection of glaucoma is comparable to pRNFL thickness.

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Tables, Figures, and Illustrations

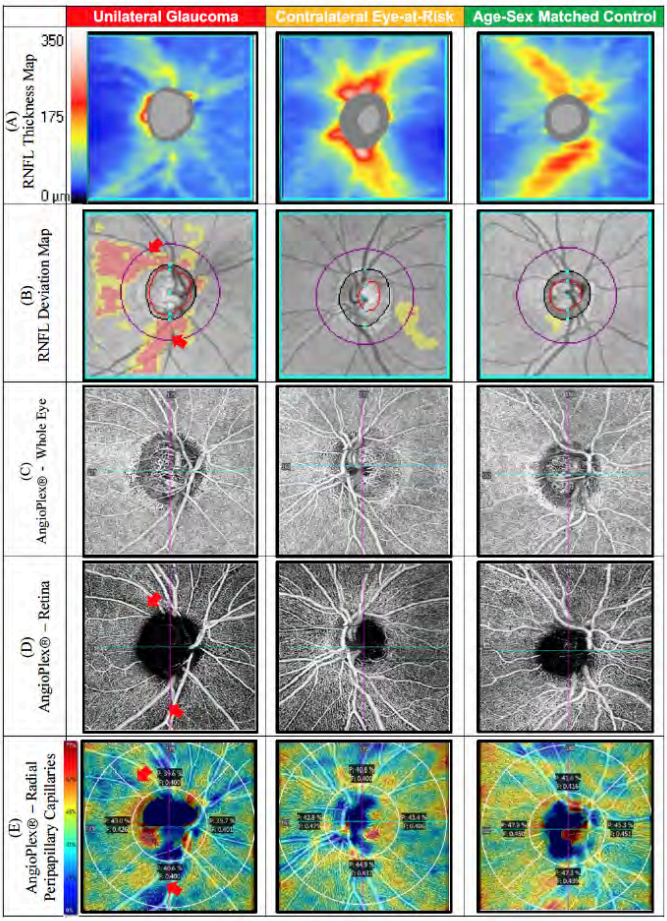

Figure 1. Representative subject showing unilateral glaucomatous right eye (column 1) with contralateral eye-at-risk (column 2) against the right eye of a normal control (column 3). OCT-A showing RNFL thickness map (A), RNFL deviation map (B), vascular en face of whole eye (C), retinal peripapillary microcirculation (D), and peripapillary microcirculation with overlay of colored AngioPlex® metrics and values per quadrant (E).

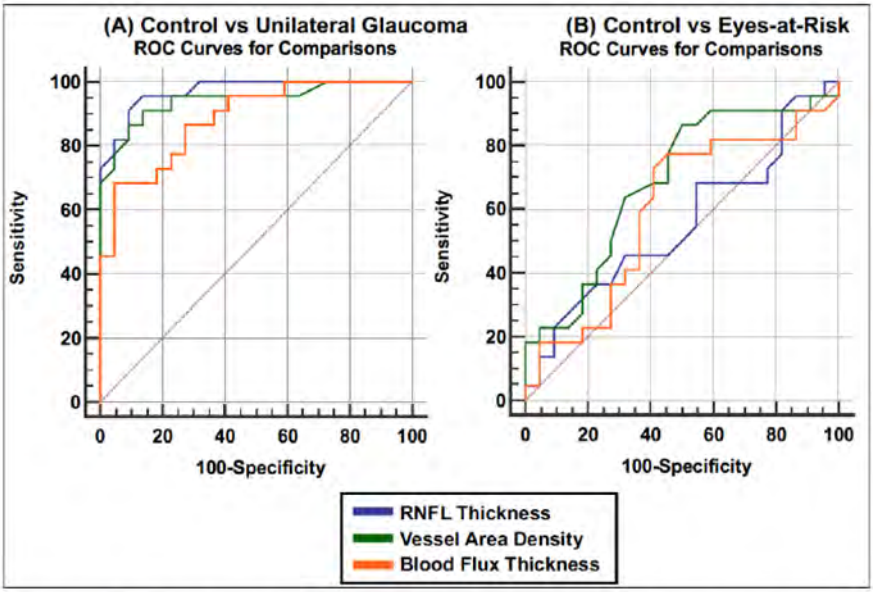

Figure 2. Results of AROC between (A) control and unilateral glaucoma, and (B) control and eyes-at-risk.

Table 3. VAD and BFI among unilateral glaucoma, eyes-at-risk, and controls.

OCTA	Unilateral Glaucoma	Eyes-at-Risk	Control	P-Value
VAD (%) / BFI	n=22	n=22	N=22	1-way ANOVA
Overall	40.0% ± 3.4 / 0.37 ± 0.05	44.4% ± 2.1 / 0.42 ± 0.05	45.6% ± 1.5 / 0.44 ± 0.03	<0.001 / <0.001
Superior	37.6% ± 5.2 / 0.36 ± 0.05	42.8% ± 3.9 / 0.41 ± 0.04	44.5% ± 2.1 / 0.42 ± 0.03	<0.001 / <0.001
Nasal	40.1% ± 2.6 / 0.37 ± 0.04	43.1% ± 2.1 / 0.42 ± 0.05	44.6% ± 2.8 / 0.44 ± 0.04	<0.001 / <0.001
Inferior	36.9% ± 5.3 / 0.36 ± 0.05	44.5% ± 2.8 / 0.42 ± 0.05	45.4% ± 2.1 / 0.43 ± 0.03	<0.001 / <0.001
Temporal	44.9% ± 2.9 / 0.38 ± 0.06	47.0% ± 2.1 / 0.44 ± 0.05	47.4% ± 2.3 / 0.45 ± 0.04	0.002 / <0.001

VAD - Vessel Area Density; BFI - Blood Flux Index; pRNFL - peripapillary retinal nerve fiber layer; SD- standard deviation.

Table 4. VAD and BFI comparison between the groups in unilateral glaucoma (UG), eyes-at-risk (ER), and healthy controls (HC).

OCTA	UG versus ER	UG versus HC	ER versus HC
Vessel Area Density / Blood Flux Index	ANOVA Bonferroni p-value	ANOVA Bonferroni p-value	ANOVA Bonferroni p-value
Overall	<0.001 / <0.001	<0.001 / <0.001	0.342 / 0.901
Superior	<0.001 / <0.001	<0.001 / <0.001	0.533 / 0.662
Nasal	<0.001 / <0.001	<0.001 / <0.001	0.169 / 0.788
Inferior	<0.001 / <0.001	<0.001 / <0.001	1.000 / 1.000
Temporal	0.018 / <0.001	0.003 / <0.001	1.000 / 1.000

VAD - Vessel Area Density; BFI - Blood Flux Index; pRNFL - peripapillary retinal nerve fiber layer

Table 5. VAD and BFI per quadrant of unilateral glaucoma eyes (n=22).

Quadrant	Vessel Area Density (%)	P-value	Blood Flux Index	P-value
Superior	37.6 ± 5.2	<0.001	0.36 ± 0.05	<0.001
Nasal	40.1 ± 2.6		0.37 ± 0.04	
Inferior	36.9 ± 5.3		0.36 ± 0.05	
Temporal	44.9 ± 2.9		0.38 ± 0.06	

VAD - Vessel Area Density; BFI - Blood Flux Index. Data are presented as mean ± SD

Table 7. AROC of pRNFL thickness, VAD, and BFI for unilateral glaucoma (n=22) and eyes-at-risk (n=22).

	Control vs Unilateral Glaucoma	Control vs Eyes-at-Risk
pRNFL thickness	0.97 ± 0.02 (0.87, 1.00)	0.56 ± 0.09 (0.40, 0.70)
Vessel area density	0.94 ± 0.04 (0.83, 0.99)	0.69 ± 0.08 (0.53, 0.82)
Blood flux index	0.88 ± 0.05 (0.75, 0.96)	0.60 ± 0.09 (0.44, 0.74)

AROC - area under the ROC curve; pRNFL - peri-papillary retinal nerve fiber layer; VAD - Vessel Area Density; BFI - Blood Flux Index.
Data are presented as AROC ± standard error with 95% confidence interval in the parentheses.

EFFECT OF SUBLINGUAL ADMINISTRATION OF TETRAHYDROCANNABINOL ON INTRAOCULAR PRESSURE, GLAUCOMA PROGRESSION AND QOL AS AN ADJUVANT THERAPY: A PILOT STUDY

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Introduction

This study assesses effect of tetrahydrocannabinol (THC) sublingual solution as an additional therapy in primary open-angle glaucoma patients (POAG).

Methods

Randomized, placebo-controlled, cross-over study was used. Eighteen eyes with mild to moderate POAG were randomized to receive 5 mg THC sublingual or placebo and continue daily before bedtime for 1 month. Switch of treatments was done after 1 month washout period. Patients were randomised to 1 of the 2 sequences, either THC 5 mg sublingual solution-placebo or placebo-THC 5 mg sublingual solution. All IOP-lowering medications are continued as prescribed before the study.

Results

After a single 5 mg sublingual THC solution, the IOP statistically decreased from baseline of 16.47 (± 1.60) mmHg to 13.90 (± 2.87), 12.9 6(± 2.59), 13.24(± 1.74) mmHg at 2,3,4 hours and significant lower in comparison to the placebo. The IOP were increasing to 13.91 (± 2.14) and 14.64 (± 4.43) mmHg at 1 and 4 weeks after 5 mg sublingual administration and not different from baseline and placebo. Sleep cycle, QoL, vital signs, and visual acuity were not significantly changed. Fifteen from 18 eyes completed the study as one patient has a transient hypertension and two have paniclike symptom.

Conclusion

THC of 5 mg sublingual dose reduced the IOP temporarily at 2–4 hours and was well tolerated by most patients for use as an adjuvant therapy. Otherwise, sublingual THC has short-lasting effects in IOP lowering which are no longer than 4 weeks.

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SUNKEN EYES, AN UNDESIRED EFFECT: A CASE OF PROSTAGLANDIN-ASSOCIATED PERIORBITOPATHY SYNDROME

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Introduction

Prostaglandin analog (PGA) is considered to be the first-line treatment of glaucoma due to its efficacy, safety, and simplicity. With a once-daily dose, it can lower IOP by 25–32%. However, some adverse effects have been reported including Prostaglandin-associated periorbitopathy syndrome (PAPS) which is often unaddressed. This case report presents a case of PAPS due to latanoprost use and its reversal possibility.

Methods

Reporting a case from glaucoma outpatient clinic in Cipto Mangunkusumo Hospital.

Results

A 49-year-old female with primary angle-closure glaucoma was on topical latanoprost for both eyes for 12 months. She complained deepened of her eyes after using this medication. Deepening of the superior eyelid sulcus and periorbital fat loss were evident. Hertel examination was used to measure enophthalmos with result of 11 mm for both eyes. Latanoprost was then switched to brinzolamide. After one month, the patient felt better appearance of her eyes and Hertel examination improvement (15 mm for both eyes). PAPS refers to the constellation of eyelid and orbital changes that accompany the administration of topical PGA eye drops. Some of the signs and symptoms seen in this patient include hyperpigmentation of the periorbital skin, deepening of the upper eyelid sulcus, flattening of the lower eyelid bags, and mild enophthalmos. Studies showed that 6–41% of latanoprost users experienced PAPS. The relationship between duration of use and PAPS remains

unclear. PAPS may cause undesirable cosmetic changes and difficulty in measuring IOP and performing surgery. Cessation of PGA for 4–6 weeks had shown partial or complete reversal PAPS as in this patient. Other anti-glaucoma drugs may be used to replace PGA for IOP control.

Conclusion

Latanoprost may cause PAPS. Although this is a non-life-threatening adverse effect, patients may consider this as an undesirable cosmetic adverse effect which may interfere compliance. Cessation of PGA has been shown to reverse PAPS signs.

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THE ACCURACY OF ARTIFICIAL INTELLIGENCE IN GLAUCOMA DETECTION: A SYSTEMATIC REVIEW

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Introduction

Glaucoma is a leading cause of irreversible blindness worldwide, emphasizing the need for early and accurate detection to initiate timely treatment. Artificial intelligence (AI) has gained attention as a potential tool for improving glaucoma detection by analysing various ocular imaging modalities. This systematic review aims to evaluate the accuracy of AI-based systems in glaucoma detection and provide insights into their diagnostic performance.

Methods

A systematic literature search was conducted in major scientific databases, including Cochrane, PubMed, MEDLINE and EMBASE, using predefined search terms. The reviewer screened the selected articles, and data on study design, sample size, AI algorithm used, imaging modality, and diagnostic accuracy measures were extracted.

Results

A total of 8 studies met the inclusion criteria and were included in the review. Various AI techniques were utilized, including machine learning, deep learning, and convolutional neural networks. Imaging modalities employed in the studies included optic disc photographs, optical coherence tomography (OCT), and visual field tests. One feature that all those studies agree on to investigate is the retinal

nerve fibre layer defect (RNFLD). Regarding sensitivity, our review discovered more varied results between models, ranging from 64.0% to 96.2%.

Conclusion

The use of AI models in diagnosing glaucoma shows a promising diagnostic capability with varied sensitivity among different algorithms and models.

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CONCORDANCE BETWEEN THE NEW MODULAR SLIT-LAMP (MSL) MOUNTED GOLDMANN APPLANATION TONOMETER (GAT), CONVENTIONAL SLIT-LAMP MOUNTED GAT, AND PERKINS TONOMETER

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Introduction

Goldmann applanation tonometer (GAT), a slit-lamp mounted device is the gold standard for IOP measurement.[1] Perkins tonometer is a hand-held alternative to GAT.[2] Our innovation of a new three-dimensional (3D) printed,[3] portable, hand-held slit lamp, named Modular Slit-lamp (MSL) is helpful for anterior segment evaluation. On this MSL, a 3D printed, hand-held tonometer mount housing a GAT was added. This served as a handheld, portable tonometer. The purpose of this study was to determine the agreement in IOP measurements obtained with MSL mounted GAT, compared to slit-lamp mounted GAT and Perkins tonometer in eyes with normal and elevated IOP.

Methods

The mount was made according to the chosen tonometer's dimensions and weight (Model AT030, Carl Zeiss, India). We used Samsung Galaxy S22 mobile phone for observing mires. Tonometry was performed by different observers and IOP measurements were obtained using slit-lamp mounted GAT, MSL GAT and Perkins tonometer in 100 eyes of 100 subjects.

Results

The tonometers were paired for comparison as: Slit-lamp GAT vs Perkins tonometer (P1), Slit-lamp GAT vs MSL GAT (P2), and Perkins tonometer vs MSL GAT (P3). The pairwise Spearman rank correlation was 0.988; 0.988 and 0.983 (all P <0 .001), respectively. The mean difference in the IOP measurement by P1 was 0.5 mmHg (95% limits of agreement: -0.6, 1.6), P2 was 1.2 mmHg (0, 2.4) and P3 was 0.7 mmHg

(-0.7, 2.1). The tonometer pairwise absolute difference between the readings did not exceed 2 mmHg.

Conclusion

The new MSL mounted GAT can be used as an alternative to hand-held or slit lamp mounted GAT to measure IOP.

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WHEN ITS NOT GLAUCOMA: DECODING THE MYSTERIOUS FIELD DEFECTS!!

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Introduction

Perimetry plays an important role in depicting the extent and depth of the visual field defects.[1,2] Some retinal diseases which are clinically indiscernible show up as visual field defect on perimetry.[3] These cases tend to get misdiagnosed as glaucoma. Here we report two such cases of primary angle closure (PAC) misdiagnosed as glaucoma due to field defects on Humphrey visual fields (HVF) secondary to chronic central serous chorioretinopathy (CSCR).

Methods

Two-patients with PAC and healthy optic discs, normal intra-ocular pressures were misdiagnosed and treated as glaucoma basing on typical glaucomatous HVF defects (repeatable superior field defects on 24-2 and 10-2 HVF). Careful clinical examination and investigations helped us in picking up the diagnosis.

Results

Fundus examination showed apart from healthy optic discs, yellowish-white precipitates in macular area and retinal pigment epithelium (RPE) atrophy. Fundus autofluorescence (FAF) revealed stippled hyper and hypo-autofluorescence involving macula and inferior retina resembling a gravitational tract pattern of chronic central serous chorioretinopathy (CSCR). Fundus fluorescein angiography (FFA) further helped us in confirming CSCR. FFA and FAF pattern of defects were correlating with visual field defect on HVF. Antiglaucoma medications were stopped, and patients were appropriately treated for CSCR

Conclusion

Retinal problems can create significant changes in glaucoma test results, making it harder to determine the status of an individual's glaucoma. High degree of suspicion of non-glaucomatous disorders is essential when structure-function correlation between optic nerve and visual field is lacking. Ancillary investigations like FAF can help us in picking up clinically indiscernible chronic CSCR.

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ORDER OF MAGNITUDE (OM): VIRTUAL REALITY-BASED VISUAL FIELD EXAMINATION TO DETECT GLAUCOMATOUS FIELD LOSS

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Introduction

Automated perimetry using Humphrey visual field (HVF) test or Octopus perimetry is not practical for glaucoma screening programs.[1,2] Technological advancements have made possible development of portable perimeters based on mobile phone or personal computer, web or head-mounted displays (HMD) which can facilitate glaucoma screening in an efficient and cost-effective manner.[3] The diagnostic accuracy of our innovative virtual-reality (VR)-based portable visual field analyser system called 'Order of Magnitude' (OM) was compared with Humphrey Visual Field Analyser.

Methods

OM follows a 2-step supra-thresholding algorithm with low and high threshold stimuli of 0.43° diameter each. The diagnostic ability of OM and HVF tests was compared against the clinical diagnosis of glaucoma by the specialists. OM test was called abnormal when all the points in one or more Glaucoma Hemifield Cluster(s) were relatively depressed with a minimum of one absolute depressed point**.**

Results

We studied 157 eyes (74 glaucomatous and 83 control) of 152 participants. Ninety-seven (61.7%) OM and 108 (68.7%) HVF tests were reliable as per the defined criteria (P=0.19, Chi-square test). The sensitivity [95% confidence interval (CI)] of OM and HVF test was 93 (86, 100) % and 98 (93.9, 100) %, respectively. Similarly, the specificity (95% CI) of OM and HVF test was 83 (72.4, 93) % and 88 (73.9, 92.8) %, respectively. The test duration (Mean ± SD) in minutes of OM test (5.4 ± 1.6) was significantly less than that of HVF test (6.2 ± 1.2, P < 0.001; t-test).

Conclusion

OM test is portable, quick, and effective visual field test suitable for glaucoma screening.

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DEVELOPMENT AND EVALUATION OF THE SCORING SYSTEM BASING ON THE DEVIATION AND THICKNESS MAPS OF SD-OCT FOR DIAGNOSING PRIMARY OPEN-ANGLE GLAUCOMA

Qiu K, Jing L

Background and rationale

To develop and evaluate a more succinct scoring system for diagnosing POAG by combining the characteristic manifestations of thickness map and deviation map of the retinal nerve fibre layer (RNFL) and ganglion cell-inner plexiform layer (GCIPL) on SD-OCT reported in previous studies and the research result of our group about the location of glaucomatous RNFL defects.

Methods

The Cirrus-HD OCT images of POAG eyes (139 eyes) and healthy eyes (151 eyes) were collected and divided into 2 sets, training (153 eyes, including 80 healthy eyes) and validation (137 eyes, including 71 healthy eyes) sets. ten topographic signs based the morphologic patterns of GCIPL (size, shape, location, colour distribution, agreement between deviation and thickness maps, and step sign) and RNFL (size, shape, location, and agreement between maps) on deviation and thickness maps were selected for developing the scoring system. Sensitivity, specificity and positive likelihood ratio (PLR) of each diagnostic signs were calculated and the score was weighted by the PLR. The total score was calculated by summing scores of all positive diagnostic signs. The area under the receiver operating characteristic curve (AUC) was plotted and compared between different scoring systems.

Results

The presence of temporal raphe sign, the shape of GCIPL deviation map, the colour distribution of GCIPL deviation map and the location of RNFL defect on RNFL deviation map were finally included in the scoring system. The AUC of this new scoring system for the diagnosis of POAG was 0.983, which was significantly better

than other OCT thickness parameters, such as RNFL temporal thickness (AUC, 0.860), RNFL superior thickness (AUC, 0.931), GCIPL mean thickness (AUC, 0.940), GCIPL supratemporal thickness (AUC, 0.913).

Conclusion

The scoring system constructed in this study basing on the RNFL and GCIPL deviation map and thickness map of Cirrus HD-OCT has high diagnostic accuracy for early glaucoma. The scoring system with only 4 diagnostic signs, which consumes less time but performs high diagnostic accuracy, has potential clinical application prospects.

BAERVELDT-350 WITH ADJUNCTIVE GONIOTOMY: ONE-YEAR OUTCOMES

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Introduction

The purpose of this analysis is to report 1-year outcomes of non-valved aqueous shunt implantation with concurrent goniotomy.

Methods

Retrospective chart review of 40 consecutive eyes undergoing goniotomy at the time of first superotemporal Baerveldt-350 implantation by a single surgeon (MQ) between 3/12/2020 and 8/31/2022. Eyes were excluded if they had missing POW4 data (5 eyes) or had trauma or uveitis (5 eyes) or if they had less than 1 year of follow-up data (5 eyes).

Results

There were 25 eyes from 22 patients with POY1 data. The mean age was 70 years, 52% were female, 96% were Black, and 84% had POAG. Concurrent cataract surgery was performed in 56% of eyes; the others were pseudophakic. The mean preoperative IOP was 21.7 mmHg on 4.2 medications and mean IOP at POY1 was 10.8 mmHg (50.2% reduction) on 2.1 medications (48.8% reduction). At POY1, all eyes had medicated IOP < 21 mmHg but 3/25 eyes (88%) with < 20% IOP reduction. No eyes had IOP ≤ 5 mmHg for 2 consecutive visits after 3 months, lost light perception, or required reoperation for glaucoma.

Conclusion

Using the PTVTs definition of failure (IOP < 21 mmHg or reduced by < 20% from baseline, IOP ≤ 5 mmHg, reoperation for glaucoma, or loss of light perception vision), our failure rate at POY1 was 12% (3/25 eyes). All 3 failures were due to IOP reduction < 20%, but 2 of these eyes had undergone surgery for the purpose of

medication reduction not IOP reduction. We posit that in addition to being a safe method of achieving early IOP lowering prior to ligature dissolution with a low risk of hypotony-associated complications given protection from episcleral venous pressure, the adjunctive goniotomy facilitates higher steroid dosing in the early postoperative period by blunting steroid response, potentially yielding thinner capsules and lower IOP long term.

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SIGNIFICANT IOP REDUCTION AFTER INTRACAPSULAR CATARACT EXTRACTION (ICCE) WITH SCLERAL TUNNEL APPROACH IN TRAUMATIC ANTERIOR LENS LUXATION INDUCED GLAUCOMA: A CASE REPORT

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Introduction

Anterior luxation of the lens is a condition that may result in narrowing of the anterior chamber angle and pupillary block causing secondary angle-closure glaucoma. This condition mostly presented as an isolated clinical entity secondary to trauma.

Methods

A 50-year-old male patient came to hospital complaining of blurred vision and pain in the left eye 3 months prior to admission caused by blunt hand trauma. Preoperative visual acuity was light perception and IOP preoperative was 58 mmHg with medication of acetazolamide 3 times a day. Anterior segment examination of the left eye showed mixed injection and corneal oedema with iris pigment deposits on corneal endothelial. The lens mass appeared to be in the anterior chamber and was attached to the iris and corneal endothelium. The patient was diagnosed with left eye traumatic anterior lens luxation induced glaucoma and underwent ICCE. A scleral tunnel was created, then lens removal was performed after releasing lens mass from corneal endothelial with gently manoeuvre using viscoelastic and iris repositor. Once the lens mass was successfully removed, suturing of the sclera and repositioning of the iris was performed and prolapsed vitreous was removed. The eye was left aphakic and postoperatively, the patient received levofloxacin and prednisolone eye drops, oral anti-inflammatory methylprednisolone, as well as oral acetazolamide and potassium aspartate.

Results

At first day postoperative follow-up, the same visual acuity was obtained because of corneal oedema and significant Descemet folds. Complaints of pain disappeared and the IOP decreased significantly to 10 mmHg.

Conclusion

ICCE combined with scleral tunnel approach is preferred surgical option to treat anterior lens luxation induced glaucoma and showed a significant IOP reduction.

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Tables, Figures, and Illustrations

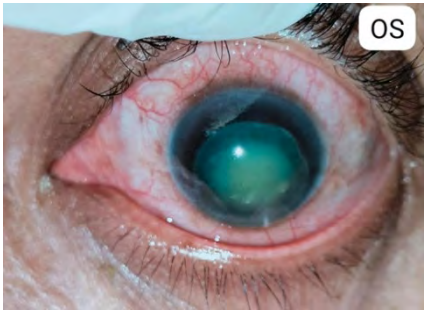

Figure 1. Clinical presentation of the left eye.

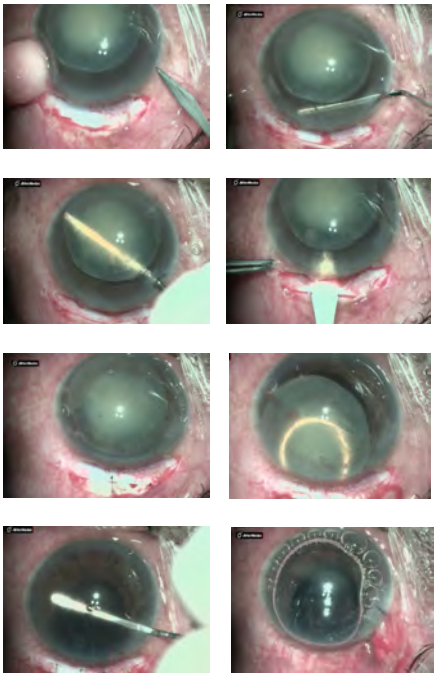

Figure 2. ICCE steps with scleral tunnel approach.

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Figure 3. Clinical presentation of left eye 1 day after surgery

PROSPECTIVE RCT, COMPARATIVE STUDY OF BENT AB INTERNO NEEDLE GONIECTOMY VERSUS CONSERVATIVE TREATMENT FOR EVALUATION OF INTRAOCULAR PRESSURE, AGM AND QOL IN POAG PATIENTS

Raj S, G S M, Pandav S, T T F, Kaushik S, Aggarwal S

Introduction

Minimally invasive glaucoma surgery (MIGS) is being in use since last decade. BANG is a cost effective MIGS procedure compared to other MIGS. Most of studies in literature reflect combining it with cataract in mild to moderate POAG patients. Standalone BANG is not described in literature. We did a prospective, randomised, controlled, comparative study of BANG versus conservative treatment in mild to moderate POAG patients. Being cost effective, BANG is more suitable for developing countries.

Methods

Forty-six patients were recruited prospectively from glaucoma clinic of a tertiary institute and randomized in two groups: Group A for BANG (N = 23) and Group B for conservative management (N = 23). Group A underwent BANG and Group B managed conservatively. Patients were evaluated for IOP control, number of AGMs and QOL as primary outcome and VA, VF, Endothelial cell density, CCT and complications as secondary outcome at baseline and follow up visits at 1, 7, 30, and 90 days. For IOP, success was defined as IOP < 21 mmHg or at least 20% reduction from baseline.

Results

Baseline characteristics were comparable between the 2 groups. IOP was less than 21 mmHg in all patients, 18 without medication and 5 on 1 or 2 medications in Group A. IOP reduction change was significant at 3 months FU. In Group B, IOP change was not significant. Comparing the 2 groups, there was a significant change in IOP at final FU. AGMs decreased by 91.7% in Group A and increased by 34.1% in Group B at final

FU. QOL improved in Group A and deteriorated in group B significantly and comparing QOL in two groups was also significant. Comparing the 2 groups for VA, VF, CCT at 3 M showed significant change. Most of complication in Group A were mild and transient except iris atrophy persisted in one patient.

Conclusions

Standalone BANG is a cost-effective procedure suitable for developing countries. AGMs decreased by 91.7% at 3 months. Can be used as an alternative to costly MIGS. Quality of life also improved.

A COMPARATIVE EVALUATION OF WATER DRINKING TEST RESPONSE IN ADVANCED GLAUCOMA PATIENTS WITH PRIOR PRESERFLO MICROSHUNT AND TRABECULECTOMY SURGERY

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Introduction

To compare the water drinking test (WDT) response in patients who have undergone Preserflo Microshunt surgery or trabeculectomy.

Methods

This prospective study examined 30 eyes of 29 advanced glaucoma subjects who had undergone trabeculectomy (n = 15) or Preserflo Microshunt (n = 15). The baseline intraocular pressure was ≤ 18 mmHg in all eyes without antiglaucoma drops. After a baseline intraocular pressure (IOP) assessment, subjects drank 10 ml water/kg body weight over 5 minutes. IOP was then measured with a Goldman tonometer every 15 minutes. Outcome measures were IOP peak, fluctuation (peak IOP—baseline IOP), time taken to peak, and time taken to return to baseline IOP.

Results

The average baseline IOP for the Preserflo group was 15 ± 1.23 mmHg, and the peak IOP was 20.5 ± 1.55 mmHg. In the trabeculectomy group, the mean baseline IOP and peak IOP were 14.83 ± 2.28 mm Hg and 19.5 ± 2.36 mm Hg, respectively. IOP fluctuation in the trabeculectomy and Preserflo groups was 5.6 ± 2.17 and 4.25 ± 2.23 mmHg, respectively, with no statistical difference in IOP profile between these 2 groups. The time taken to peak and return to baseline was 27±5.6 and 55±4.8 minutes in the trabeculectomy group and 36.25 ± 9.8 and 57.25 ± 9.8 minutes in the Preerflo group, with a significant intergroup difference (p = 0.017 and 0.03).

Conclusion

Subjects who had undergone either trabeculectomy or Preserflo surgery showed a similar IOP response to the WDT. However, trabeculectomy patients demonstrated better outflow facility, represented by a shorter time to reach peak and faster IOP recovery.

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THE IMPACT OF GLAUCOMA SURGICAL AND LASER PROCEDURES ON POSTURAL VARIATIONS IN INTRAOCULAR PRESSURE: A SYSTEMATIC REVIEW

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Introduction

Postural intraocular pressure (IOP) variation – changes in IOP when moving from one body position to another, have been shown to be correlated with glaucoma severity and progression. Both laser and surgical glaucoma procedures have been shown to reduce postural IOP variation and may be related to their efficacy in reducing glaucomatous progression. This systematic review aims to summarize the current literature exploring the impact of various glaucoma procedures on postural IOP variations.

Methods

A comprehensive literature search of the MEDLINE, EMBASE, and CENTRAL databases was performed alongside subsequent hand searches, with a combination of keywords and relevant MeSH terms. Studies performed in adult patients (>18 years old) with open-angle glaucoma who had undergone glaucoma procedures, including laser and surgery, were included for consideration. Outcome measures included the postural IOP recorded in varying postures (sitting, supine, dependent lateral decubitus position (DLDP) and non-DLDP), reported preoperatively and at each post-procedural timepoint.

Results

Initial literature review yielded 1,105 results, of which 13 studies were included in final review. Trabeculectomy consistently demonstrated the greatest benefit in reducing postural IOP variations. The greatest reduction in IOP variation was observed from a pre-operative sitting-to-DLDP baseline IOP variation of 6.18 ± 3.62 mmHg to 3.71 ± 2.04 mmHg at 6 months postoperatively. MIGS procedures (iStent Inject, XEN45 Gel Stent) also resulted in reductions in postural sitting-to-supine IOP variation, to various extents. The impact of laser trabeculoplasty on postural IOP variation was found to be minimal. Across studies, the greatest postural IOP change appeared to be between the sitting-to-DLDP position, for all procedures and at all timepoints.

Conclusion

Trabeculectomy appears to have the greatest effect in lowering postural IOP variations, for various change of positions. MIGS procedures also reduced postural IOP variations to various extents, while laser trabeculoplasty appeared to have minimal effect on post-operative postural IOP variations.

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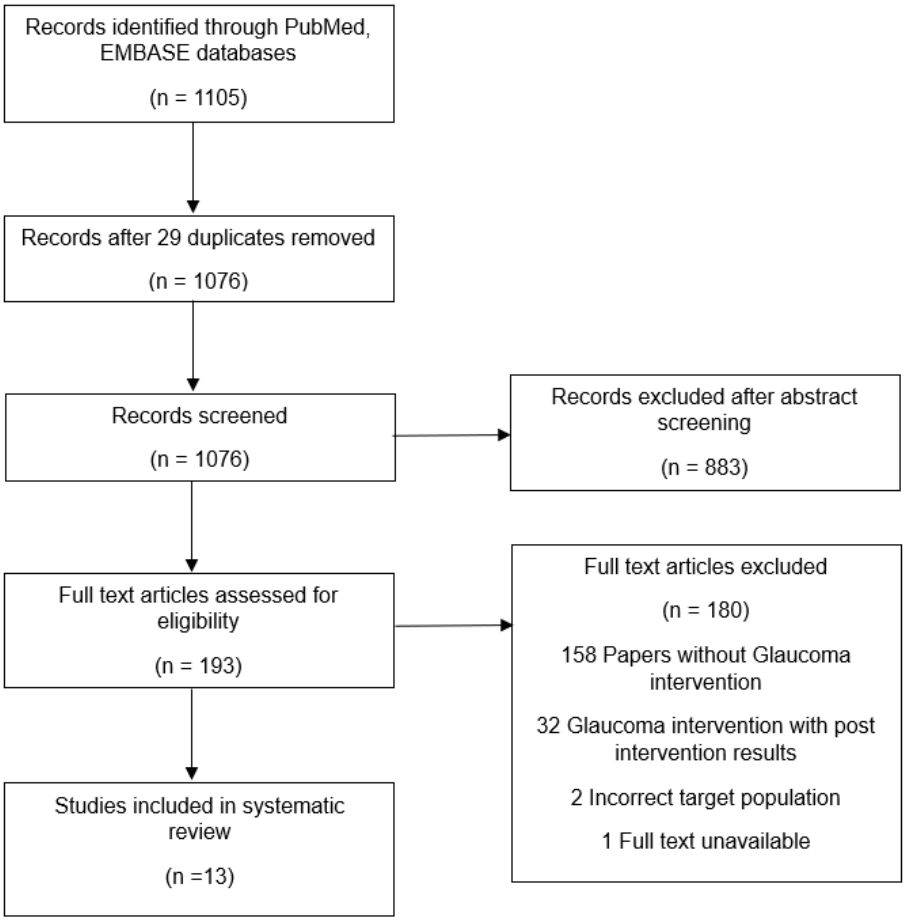
Tables, Figures, and Illustrations

Figure 1. PRISMA flowchart.



PRECISION IN PRACTICE: UNVEILING MIGS MASTERY WITH THE MIGS SIMULATOR - A CUTTING-EDGE 3D AUGMENTED REALITY APP FOR TRAINING NEOPHYTES

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Introduction

MIGS Simulator, a 3D augmented reality app, represents a revolutionary leap in ophthalmology education and training. Specifically designed for glaucoma concepts and microinvasive glaucoma surgery (MIGS), this innovative app fills a crucial gap in ophthalmic clinics by offering a simulative learning platform.

Methods

Utilizing real-time, high-resolution TrueColour confocal images, this app constructs intricate 3D models of ocular anatomy. This user-friendly app, compatible with HoloLens 2 (Microsoft Corporation, Washington, United States), empowers users with an interactive 3D atlas, enhancing hand-eye coordination for MIGS. Only a powerful cognitive tool, such as a 3D atlas with real unanimated images, can fill these mental gaps. Users can choose their optimal frame, cross-section, and zoom amount to visualise various parts of the eye.

Results

MIGS Simulator transforms ophthalmic education through a unique combination of simulative learning and advanced visualization. Serving as a cognitive bridge, it aids users in comprehending ocular intricacies and prepares MIGS practitioners for the essential 3D micro space in surgery.

Conclusion

MIGS Simulator is a groundbreaking, user-friendly, cost-effective, and portable innovation in ophthalmic education. Leveraging 3D augmented reality and real unanimated images, the app significantly contributes to addressing critical knowledge gaps and advancing MIGS and ophthalmic microsurgery.

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Figures

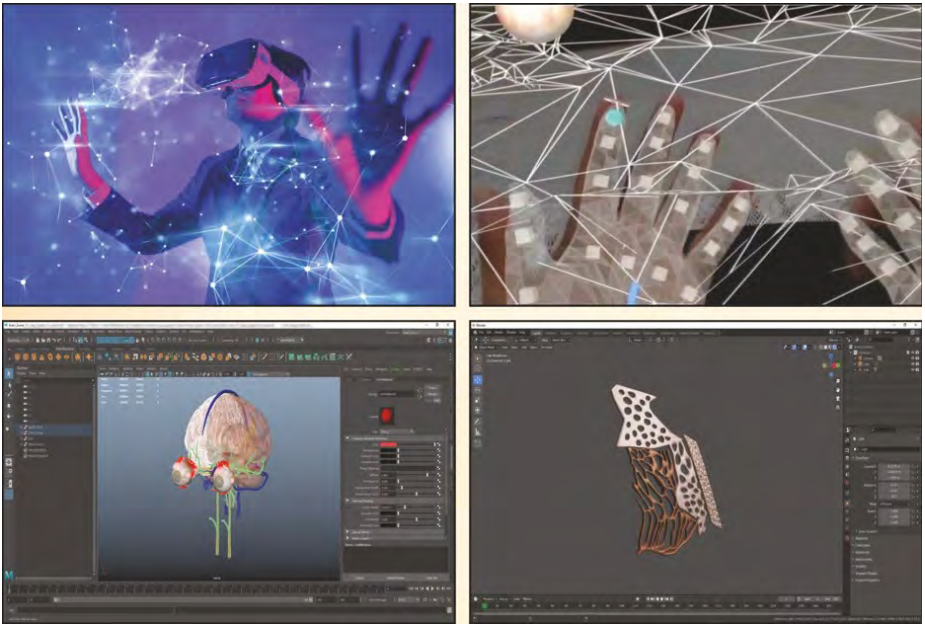

Figure 1. Referring to the standard anatomic and ophthalmic textbook images, the 3D models were constructed in computer-aided design software such as Autodesk Maya and Blender.

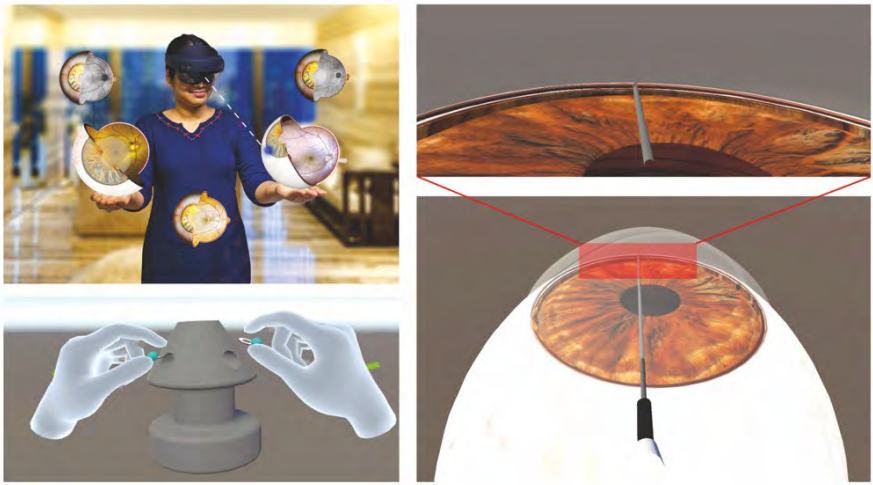

Figure 2. 3D simulator with MIGS training for immersive glaucoma learning.

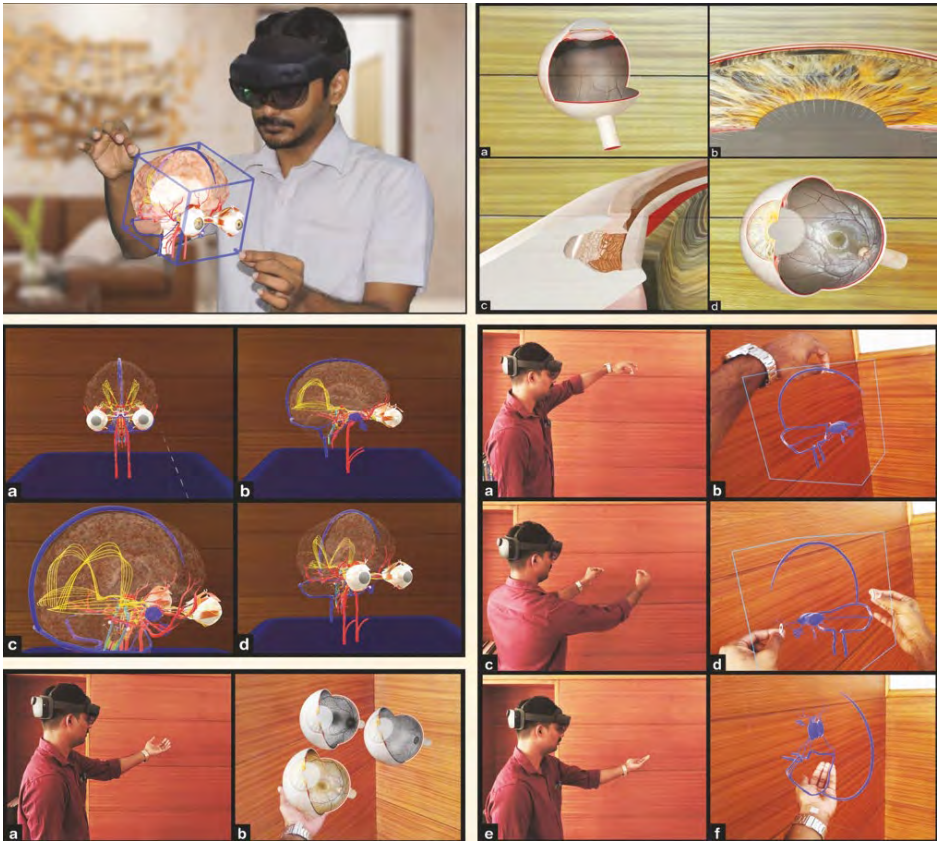

Figure 3. Users can dynamically choose their optimal frame, cross-section, and level of zoom to visualize various aspects of the eye.

THE BATTLE OF THE TWO MIGS LEGIONS: DEVICE-BASED ISTENT VS NON-DEVICE-BASED BANG

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Introduction

Minimally invasive glaucoma surgeries (MIGS) have transformed the glaucoma treatment landscape. This study aims to compare the efficacy and safety of 2 MIGS approaches: the device-based iStent and the non-device-based bent ab interno needle goniectomy (BANG).

Methods

A prospective, comparative study conducted over 1 year included 20 patients in the iStent group and 29 in the BANG group with mild to moderate primary open-angle glaucoma. Patients with angle-closure and secondary glaucoma were excluded. Pre- and postoperative intraocular pressure (IOP), changes in antiglaucoma medications (AGM), and post-operative complications were assessed. The objective aimed at measuring the effectiveness of each procedure based on achieving complete success (IOP > 5 and ≤ 20 mmHg without medication) and qualified success (IOP > 5 and ≤ 20 mmHg with medication). Failure to meet these criteria and/or requirements for reoperation was defined as failure.

Results

The BANG group demonstrated a mean post-operative IOP of 15.07 (± 1.90) mm Hg, IOP reduction of 6.27 (± 0.72) mm Hg, and AGM reduction of 0.86 (± 0.28). In comparison, the iStent group exhibited a mean post-operative IOP of 17.18 (± 3.72) mm Hg, IOP reduction of 3.10 (± 0.63) mm Hg, and AGM reduction of 0.57 (± 0.13). While both groups showed comparable complete success rates (BANG 68%, iStent

57%) and qualified success rates (BANG 25%, iStent 29%), iStent outperformed in total success, boasting a lower failure rate (7% vs 14%).

Conclusion

This study provides valuable insights into the comparative effectiveness of iStent and BANG in MIGS. Despite BANG displaying a higher complete success rate, iStent emerged as the superior MIGS option, exhibiting higher total success, a lower failure rate, and fewer post-operative complications. Clinicians should consider these findings when selecting the optimal surgical approach for glaucoma management, with iStent being the preferred choice based on this study's outcomes.

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ANNOTATING AND PREDICTING ARTIFICIAL INTELLIGENCE TOOLBOX: DIAGNOSING STRUCTURAL GLAUCOMATOUS DAMAGE FROM CONFOCAL FUNDUS IMAGES

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Introduction

This study introduces a novel convolutional neural network (CNN) approach to detect glaucomatous damage in confocal fundus images, aiming to overcome the black-box dilemma prevalent in artificial intelligence (AI). In addition to identifying glaucoma, this tool distinguishes a spectrum of signs, from trivial splinter haemorrhages to catastrophic glaucomatous optic atrophy, facilitated by customized human annotations.

Methods

A dataset of 1,900 high-resolution fundus images were utilized, with 60% for training, 20% for validation, and 20% for held-out testing. Employing 26 annotated signs related to glaucoma, the You Only Look Once 5 algorithm was implemented for detection. The tool demonstrated the ability to locate and draw customized anchor boxes over various areas within the fundus images. Testing images were divided into four groups for three runs, performed every 15 days.

Results

Evaluation of the AI tool, measured by mean average precision (mAP), revealed consistent accuracy increments from 84.44% to 97.0% in predicting diagnoses and intricate signs. Sensitivity improved from 82.6% to 97.1%, and specificity enhanced from 97.0% to 100%. Objectness loss, classification loss, precision, and recall were also assessed, contributing to the tool's comprehensive performance metrics.

Conclusion

Continuous training with a feedback mechanism resulted in an upsurge in prediction accuracy, effectively addressing the black-box dilemma. The created explainable AI toolbox achieved a sensitivity of 97.1% and specificity of 100%. While fundus images obtained with lower-resolution cameras may face challenges, integrating multimodal clinical images, including optical coherence tomography and visual fields, can enhance the generalisation and reliability of the AI diagnostics system.

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Figures

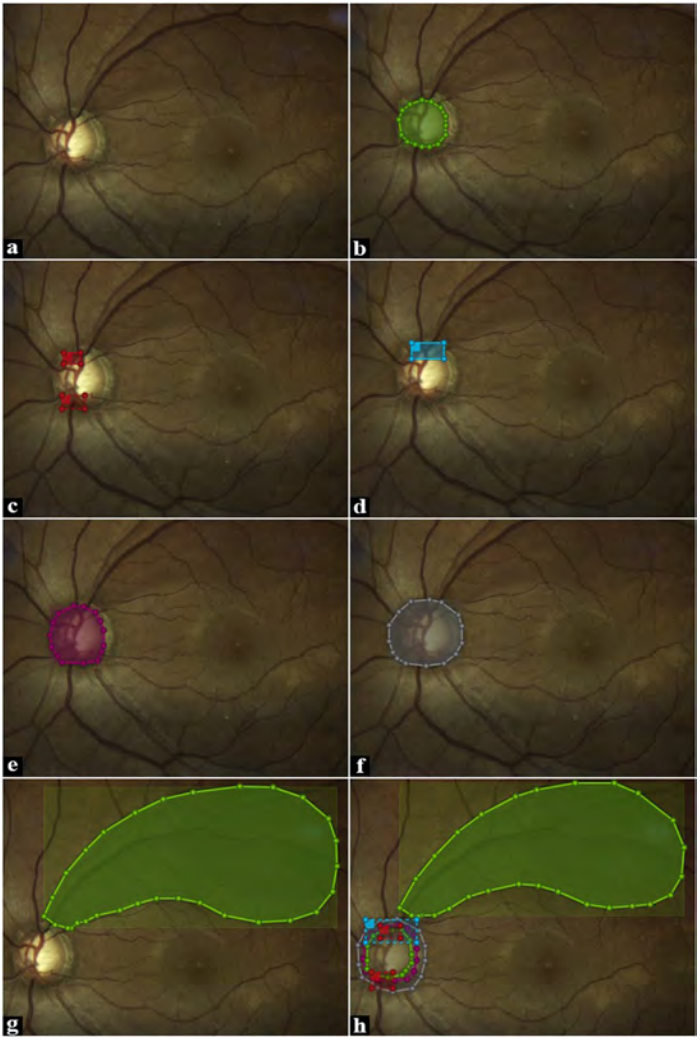

Figure 1. Sample fundus photograph of an eye with various glaucomatous findings

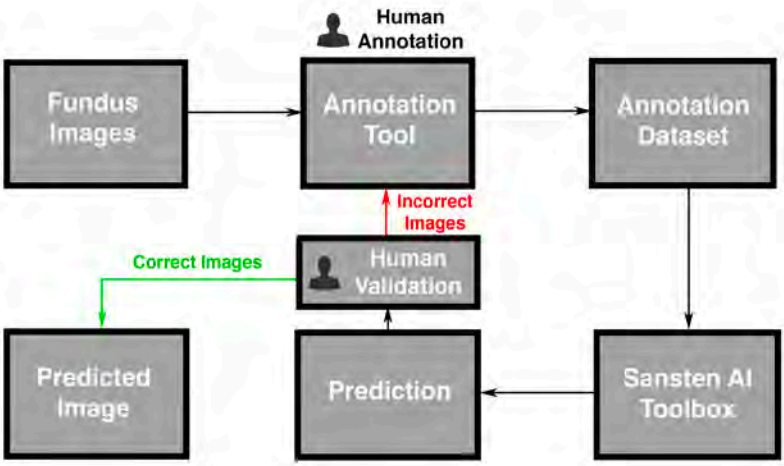

Figure 2. Image showing the methodology workflow of this study.

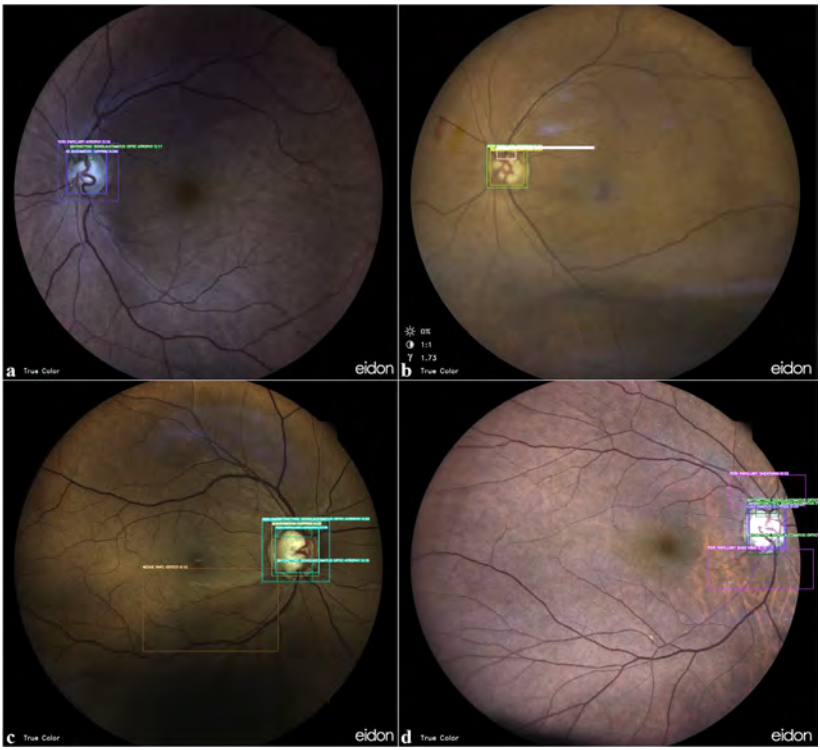

Figure 3. Image depicting the prediction done by the trained AI module on feeding a new fundus image not previously trained by the tool, after the AI tool has been primed and trained.

AN INNOVATIVE, SELF-BUILT, 3D, COST-EFFECTIVE, SMART PHONE APP FOR SIMULATIVE GLAUCOMA LEARNING

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Introduction

The cornerstone of Eye MG Max, our augmented reality (AR) program, lies in its unique selling proposition—empowering patients with a personalised and immersive exploration of different anatomical and pathological aspects of the eye related to glaucoma. The primary objective is to simplify glaucoma counselling, offering patients multiple customized angles of their choice. Eye MG Max pioneers a paradigm shift by constructing complex structures such as the angles of the anterior chamber and optic nerve head in advanced real-time three-dimensional (3D) photoreal visuals. The application is available free of cost for iPhone users on the App Store.

Methods

A cross-sectional study conducted via Google Forms compared satisfaction levels in ophthalmology training sessions for neophytes with and without 'Eye MG Max.' A robust response from 203 ophthalmologists during the 1-week study period (July 1–7, 2022) unveiled insightful findings.

Results

Feedback categorization for training sessions with and without Eye MG Max demonstrated a significant difference ($p < 0.05$) in satisfaction levels, underscoring its positive impact on neophytes' learning experiences. The efficacy of Eye MG Max extends beyond visualization, facilitating counselling on a spectrum of procedures—from simple YAG peripheral iridotomy to intricate trabeculectomy and tube surgeries.

Conclusion

Eye MG Max revolutionizes glaucoma education with 3D counselling through augmented reality, offering a user-friendly interface and deep visualisation. This transformative tool has the potential to reshape glaucoma counselling, providing unprecedented insights and enhancing patient engagement in a patient-friendly manner.

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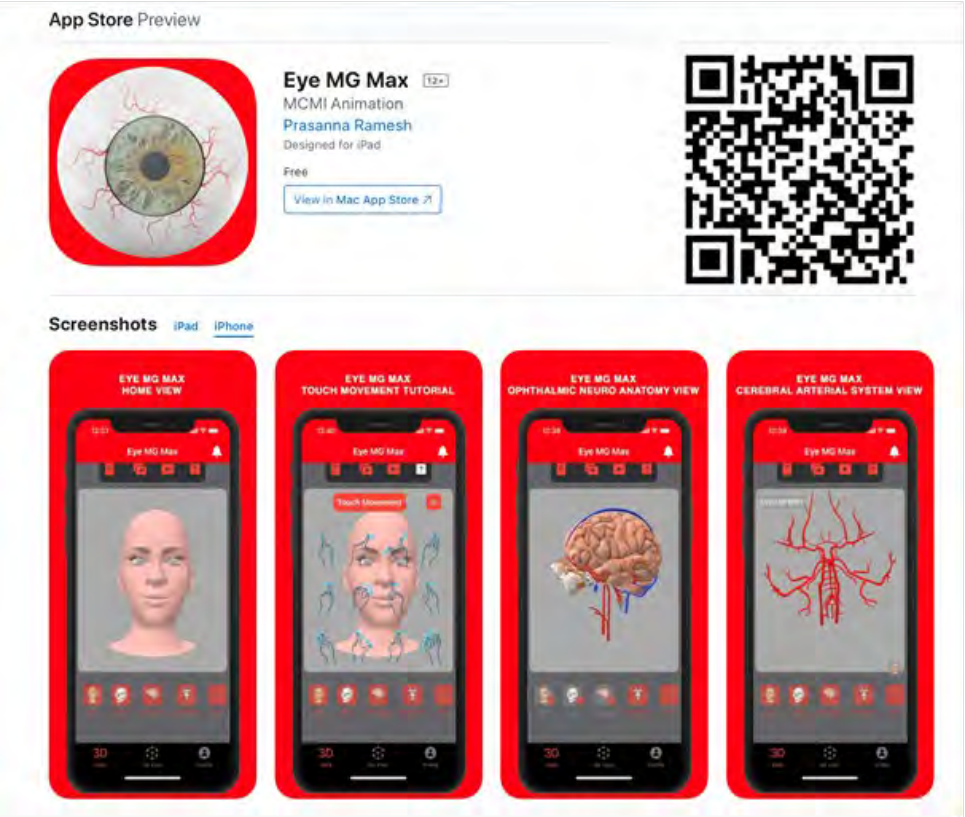


Figure 1. Application preview in App Store for iPhone users. Application preview in App Store for iPhone users. App Store Preview of Eye MG Max.

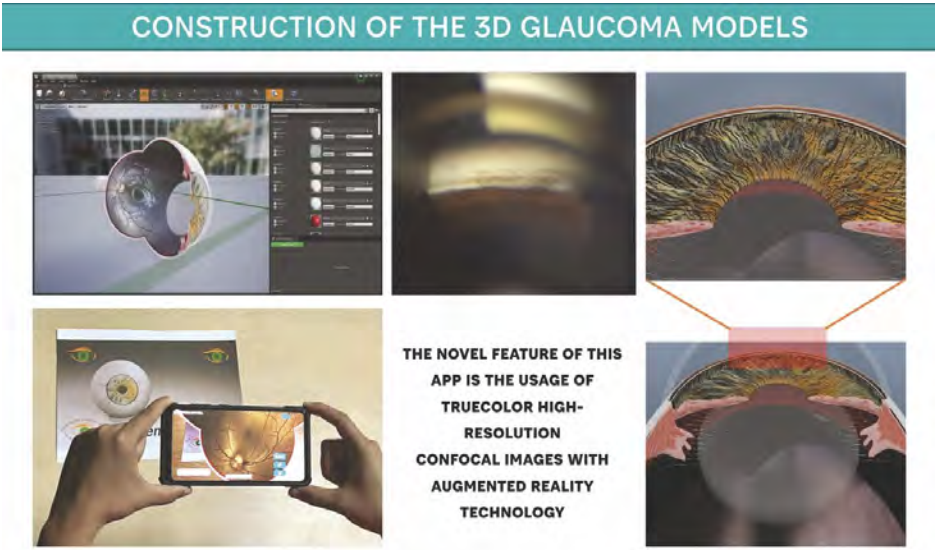


Figure 2. Construction of the 3D glaucoma models.

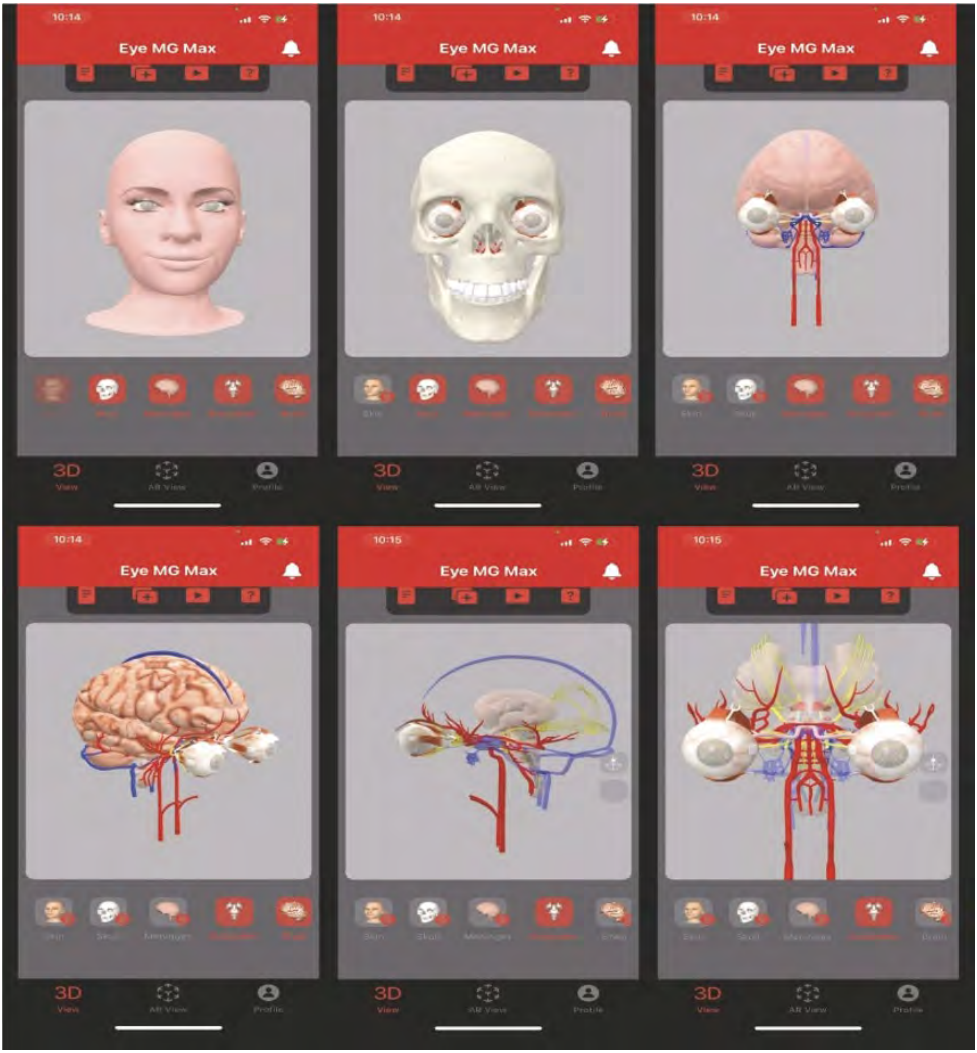


Figure 3. Subtractive learning module in the app.

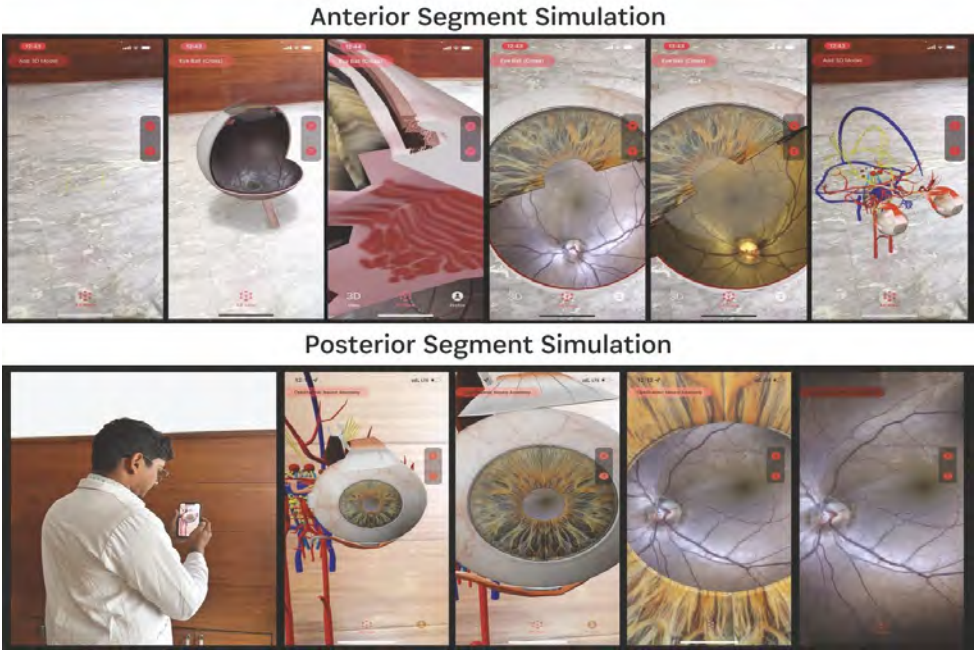
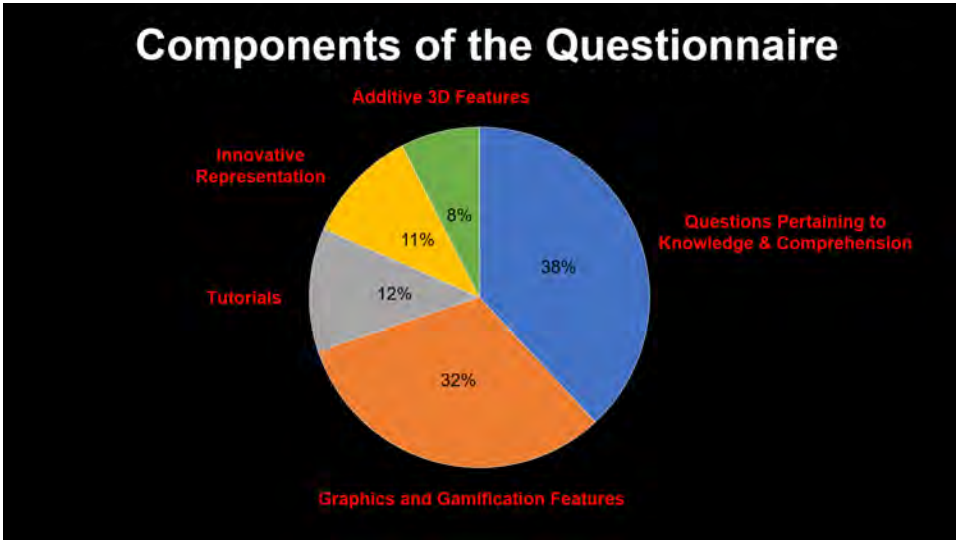


Figure 4. Augmented reality simulations in the app.



The components of the questionnaire used for measuring the satisfaction level.

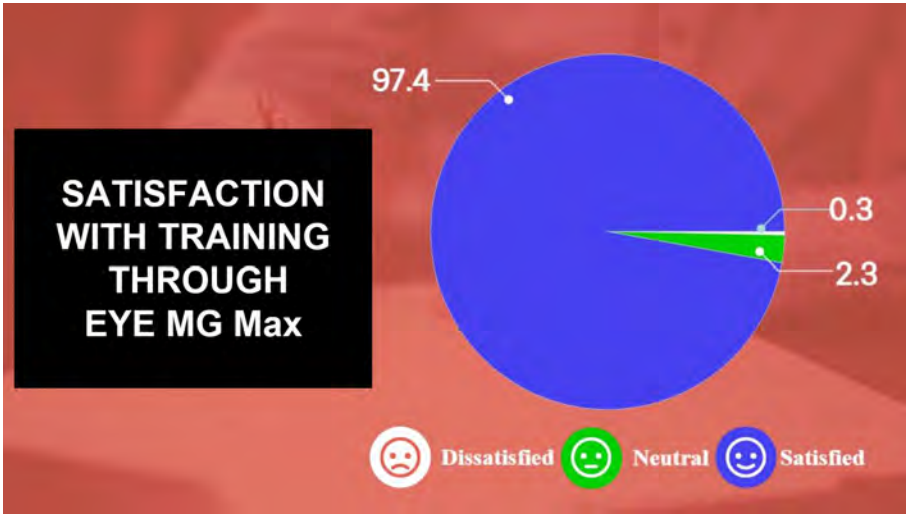


Figure 5. Satisfaction level for the users through Eye MG Max.

Figure 6. Satisfaction level for the users without Eye MG Max.

MODELLING AND MITIGATING ANNOTATIONS WITH HUMAN-IN-THE-LOOP MACHINE LEARNING FOR AUTOMATED MULTIMODAL ASSESSMENT OF ANTERIOR CHAMBER ANGLES IN GLAUCOMA PATIENTS

Ramesh P[1]

[1]Medical Officer, Department of Glaucoma and Research, Mahathma Eye Hospital Private Limited

Introduction

Automated measurement of critical angle parameters, including trabecular-iris-angle (TIA), angle opening distance (AOD), and angle recess area (ARA), remains scarce in various non-invasive image modalities. This study addresses this gap by introducing a multimodal artificial intelligence (AI) toolbox for comprehensive angle assessment, overcoming the limitations associated with the black box dilemma commonly observed in many existing AI toolboxes.

Methods

Utilizing TrueColor confocal ultrasound biomicroscopy (UBM), anterior segment optical coherence tomography (AS-OCT), Anterion, and Scheimpflug images, a human-in-the-loop machine learning approach was employed. Annotation of 3 angle structures—scleral spur, trabecular meshwork, and trabecular-iris angle—was conducted. A dataset of 400 high-resolution TrueColor confocal images from 205 glaucoma patients included 100 UBM images, 67 AS-OCT images, 67 Scheimpflug images, and 57 Anterion images, each with open angles, narrow angles, and angle closures.

Results

A convolutional neural network (CNN) based on the InceptionV3 network facilitated automatic classification of angle closure and open angle, with precise localization of the scleral spur, trabecular meshwork, and trabecular-iris angle. The tool

demonstrated proficiency in locating the scleral spur and drawing customized angles across UBM, AS-OCT, Anterion, and Scheimpflug images.

Conclusion

This study achieves high accuracy in the automatic detection of angle structures through human-in-the-loop machine learning. Continuous training via a feedback mechanism enhances prediction accuracy. The integration of multimodal non-invasive clinical images, including AS-OCT, UBM, Anterion, and Scheimpflug imaging, along with gonioscopic images and biometric parameters, is recommended to establish a generalized, reliable, and explainable AI diagnostics system.

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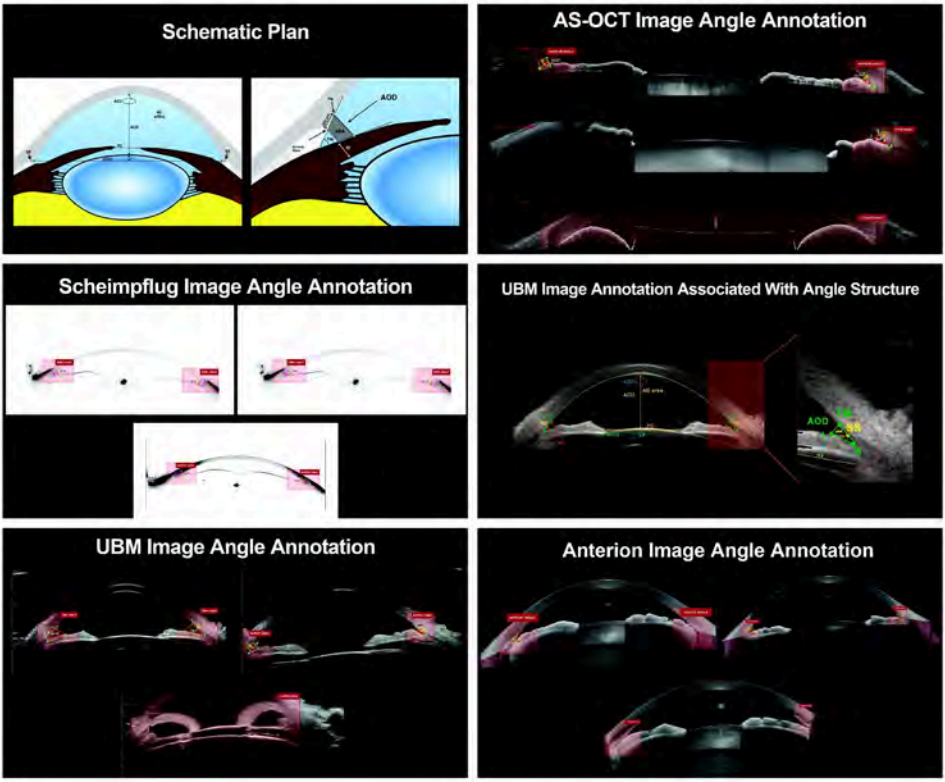

Figure 1. Schematic plan and angle annotations in various multimodal imaging.

AN ATYPICAL CASE OF RIPASUDIL-INDUCED LATE-ONSET CHOROIDAL DETACHMENT:AN IDIOSYNCRATIC IRONY

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[1]Medical Officer, Department of Glaucoma and Research, Mahathma Eye Hospital Private Limited

Introduction

We present a unique and atypical case involving a 70-year-old male with advanced glaucoma with glaucomatous optic atrophy who underwent trabeculectomy with mitomycin-C. Despite successful initial outcomes, the reintroduction of bimatoprost (0.03%) and ripasudil (0.4%) led to a rare occurrence of late-onset choroidal detachment (CD).

Methods

Pre-trabeculectomy, the patient's intraocular pressure (IOP) was 20 mmHg with maximum medical therapy. Post-surgery, his IOP stabilized at 13 mmHg without medication. Two months later, due to an IOP increase to 20 mmHg, bimatoprost (0.03%) and ripasudil (0.4%) were reintroduced. Three months post-medication reintroduction, the patient presented with blurred vision, an IOP of 5 mmHg, and a 360-degree CD. Visual field analysis using Humphrey Visual Field Analyzer revealed a mean deviation of -27.83 dB.

Results

Prompt discontinuation of all anti-glaucoma medications and initiation of steroid therapy (prednisolone e/d 1% and oral prednisolone) resulted in CD resolution within one week. IOP improved to 12 mmHg, and best-corrected visual acuity recovered to 6/9. The patient expressed satisfaction with the outcome.

Conclusion

This case highlights the idiosyncratic irony of late-onset CD following trabeculectomy, exacerbated by the reintroduction of Ripasudil and Bimatoprost. The successful resolution with steroid therapy underscores the importance of monitoring patients for unusual responses to glaucoma medications, including visual field changes. This rare case underscores the need for heightened awareness of potential complications associated with anti-glaucoma medications post-trabeculectomy. Clinicians should exercise caution in post-trabeculectomy scenarios, emphasizing meticulous follow-up and intervention. Vigilant monitoring and timely intervention, considering specific IOP values, drug percentages, and visual field changes, are crucial in ensuring optimal outcomes in glaucoma management.

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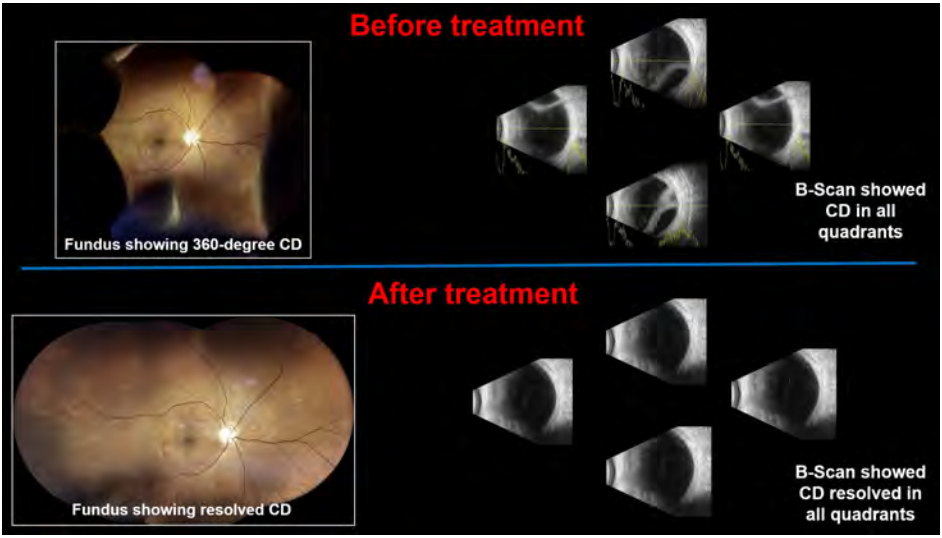

Figure 1. Fundus and B-scan images illustrating the choroidal detachment before and after the treatment.

INVESTIGATION OF NON-GLAUCOMATOUS VISION LOSS IN STURGE-WEBER SYNDROME

Ramos D[1], Victor Ephraime V. Paulino[1]

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Introduction

Sturge-Weber syndrome (SWS) is a phakomatosis classically presenting with port-wine stains, leptomeningeal capillary-venous malformations, and ocular abnormalities that often lead to glaucoma.[1] We report a case of SWS in a patient with decreasing visual acuity despite having no strong evidence of glaucoma.

Methods

A 30-year-old male with SWS presenting with a right-sided port-wine stain and history of seizures was referred to the glaucoma clinic. He had supposedly been treated for open-angle glaucoma since childhood, but he has had deteriorating visual acuity despite low intraocular pressures (IOP) and non-glaucomatous visual fields. He underwent a comprehensive eye exam with dilation and gonioscopy. Corneal topography, anterior segment optical coherence tomography, and B-scan ultrasonography were performed.

Results

Examination of the right eye showed hand movement vision, band keratopathy, posterior synechiae, extensive synechial angle closure, and posterior subcapsular cataract. Diagnostics showed marked central corneal thickening and no sonographic evidence intraocular abnormalities. The eye was deemed to have good visual potential. A staged procedure with EDTA chelation followed by careful cataract extraction and synechiolysis was planned.

Conclusion

This showcases the features and complications that lead to vision loss in SWS. Ocular hypertension and glaucoma lead to irreversible blindness and are often treated aggressively. However, reversible causes of vision loss such as cataract, keratopathies, and uveitis may also occur during treatment. These sequelae are often overlooked in clinical follow-up and should be recognized to ensure ideal management and to prevent unnecessary glaucoma therapy.

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Figures

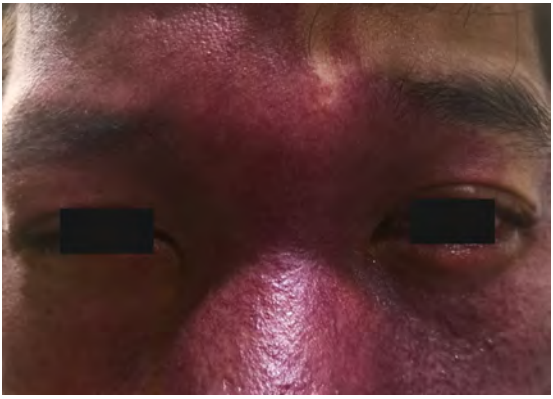

Figure 1. Port-wine stain

Figure 2. Band keratopathy and posterior synechiae.

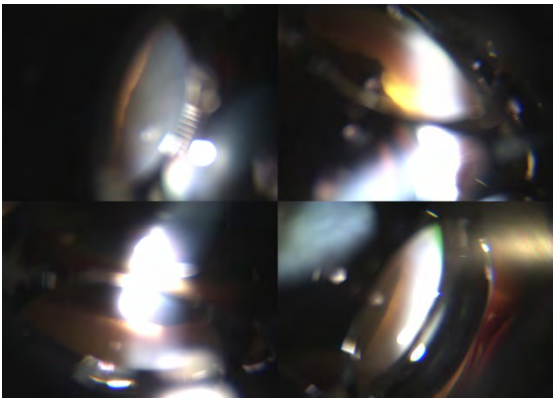

Figure 3. Extensive synechial closure of the angles.

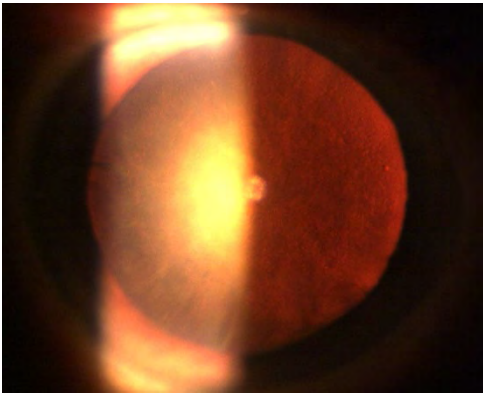

Figure 4. Posterior subcapsular cataract.

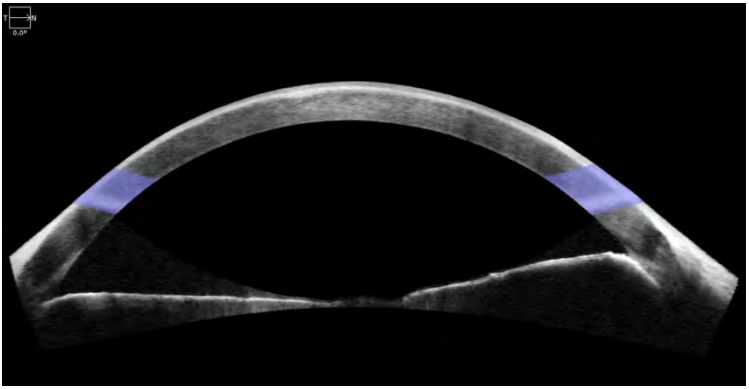

Figure 5. Anterior Segment Optical Coherence Tomograph showing a thickened and hyperreflective central cornea.

TRABECULECTOMY AND AHMED VALVE IMPLANTATION IN SEPARATE EYES OF A 28-YEA- OLD WITH ANIRIDIC GLAUCOMA

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[1]Makati Medical Center

Introduction

Aniridia is a rare disorder characterized by iris hypoplasia, but may affect the cornea, anterior chamber angle, lens, retina, and optic nerve.[1] Aniridia may also result in secondary glaucoma, which is usually refractory to medical management and requires surgical management.[2] This report focuses on different surgical techniques and corresponding response of aniridic glaucoma, done in separate eyes of a young individual, with trabeculectomy being done in one eye and Ahmed valve implantation done in another eye.

Methods

Thorough clinical examination was done preoperatively and postoperatively to monitor response to treatment.

Results

A case of a 28-year-old male who was diagnosed with aniridia in childhood underwent bilateral cataract surgery at 10 years of age at another institution. On regular follow-up, he was noted to have increased pressures, which prompted referral to the glaucoma service at our institution. He was managed medically, but eventually underwent trabeculectomy on the left eye at 26 years of age. Patient was unable to consult for 2 years, and on follow-up was noted to have increased pressures of 40 and 50 mmHg. Patient was started on acetazolamide, with pre-operative pressures of 28 mmHg. He eventually underwent trabeculectomy with Mitomycin-C for the right eye, while the left eye underwent Ahmed valve implantation. Post-operative pressures fluctuated on both eyes, with generally lower pressures on the left early on. Increases in intraocular pressure were initially

managed medically and with 5-fluorouracil injections at different time points for each eye. The patient eventually underwent bleb revision and Ahmed valve implantation for the right eye.

Conclusion

This case has proven that aniridic glaucoma remains to be challenging to manage, due to the lack of consensus on the best surgical management. It also exhibits the differences in post-operative response in trabeculectomy versus Ahmed valve implantation in a single individual.

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COMBINATION OF ROPIVACAINE 0,75 % WITH FENTANYL 2 MCG/ML IN PERIBULBAR BLOCK FOR TRANSSCLERAL CYCLOPHOTOCOAGULATION PROCEDURE IN REFRACTORY GLAUCOMA

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Introduction

Peribulbar block is a simple, fast, and safe alternative to transscleral cyclophotocoagulation (TSCPC) but requires large volume to produce the desired block. Ropivacaine has the advantage of lower cardiotoxicity compared to bupivacaine, it has long duration and minimal intraocular pressure effect. The addition of fentanyl can provide stronger analgesic effect, with administration at a minimal dose providing minimal systemic effects. The aim of the study is to report the combination of ropivacaine 0.75% with fentanyl 2 mcg/ml in peribulbar block for TSCPC in refractory glaucoma.

Methods

This was a case series study. Peribulbar block was performed with the use of 25 gauge-25 mm length needle, and injected in inferotemporal and medial canthus with mixture of 8 – 13 ml ropivacaine 0.75% and fentanyl 2 mcg/cc. The patient was given paracetamol 1 gram orally every 6 hours and the pain score was evaluated 1 day later.

Results

Peribulbar block conducted in 5 refractory glaucoma patients. The pain score was mild to moderate. The addition of fentanyl to the peribulbar block is effective in improving the quality of analgesia and reducing postoperative pain scores. All

patients can undergo TSCPC without pain. There were no nausea, vomiting, sedation, desaturation, hypotension, or bradycardia.

Conclusion

Ropivacaine 0.75% with additional administration of fentanyl 2 mcg/ml can improve the quality of the block for TSCPC action and shows minimal systemic effects.

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INTEREST OF NON-ABSORBABLE IMPLANT (ESNOPER) TO ENHANCE AQUEOUS OUTFLOW IN DEEP SCLERECTOMY

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Introduction

Different implants have been used in the past to improve the filtration in non-penetrating glaucoma surgery. Herein, we present the technique we use for enhanced deep-sclerectomy, using a non-absorbable uveoscleral implant (Esnoper clip and V2000).

Methods

Case series with 11 patients. Observational study. After the deep dissection, we create a suprachoroidal pocket to introduce the non-absorbable hema-implant, without suturing.

Results

This implant creates a virtual space between the scleral flap and the suprachoroidal space with good postoperative results. All the patients had a pressure lower than 14 mmHg after 4 weeks and no medication. We only report 1 case of malignant glaucoma after surgery.

Conclusion

Esnoper clip and V2000 are safe implants with limited complications and good postoperative results.

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BLEB-ASSOCIATED ENDOPHTHALMITIS IN A JUVENILE OPEN-ANGLE GLAUCOMA PATIENT

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[1]Cardinal Santos Medical Center, Philippines, [2]University of Santo Tomas Hospital, Philippines

Introduction

Bleb-related endophthalmitis (BAE) refers to the infection around or inside a filtering bleb with vitreous involvement. With the advent of antimetabolite use in trabeculectomy, this condition is now much common. Here, we describe a case of BAE and its risk factors, diagnosis, and treatment.

Methods

This is a case report of a patient who presented with acute redness and discharge of the right eye. Patient had undergone trabeculectomy with mitomycin-C for both eyes for juvenile open-angle glaucoma 2 years ago and was lost to follow-up.

Results

On examination, there was conjunctival congestion, corneal oedema, and anterior chamber hypopyon. A thinned out avascular cystic bleb with positive Seidel's test was noted. Ocular ultrasound showed vitreous cells. Culture and sensitivity tests did not yield any growth. Patient was treated with intravitreal vancomycin and ceftazidime. A combined bleb excision with conjunctival advancement and pars plana vitrectomy was performed. Patient responded well to treatment.

Conclusion

Bleb-related endophthalmitis in one of the complications of filtering surgery that ophthalmologist must consider when presented with acute eye pain, redness and blurred vision after undergoing trabeculectomy. Diagnosis is guided with culture

and sensitivity studies. Early recognition and treatment with intravitreal antibiotics with pars plana vitrectomy may lead to better visual outcome.

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Figures

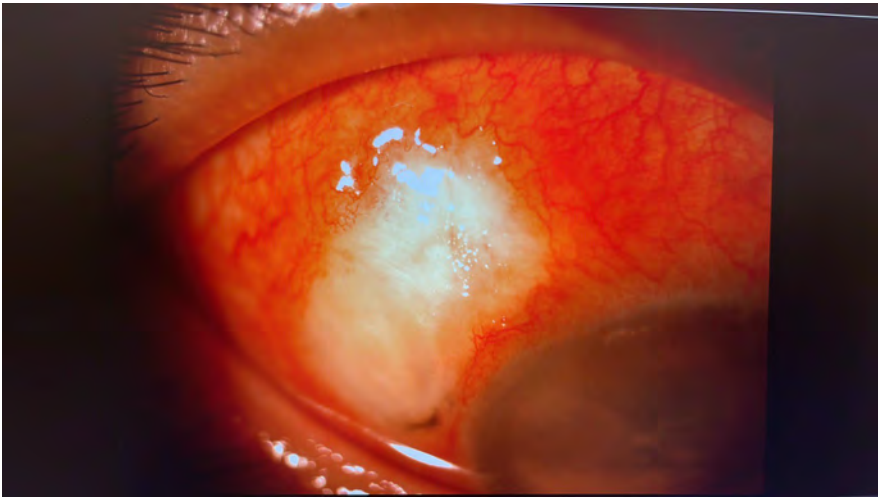

Figure 1. Avascular cystic bleb with conjunctival congestion.

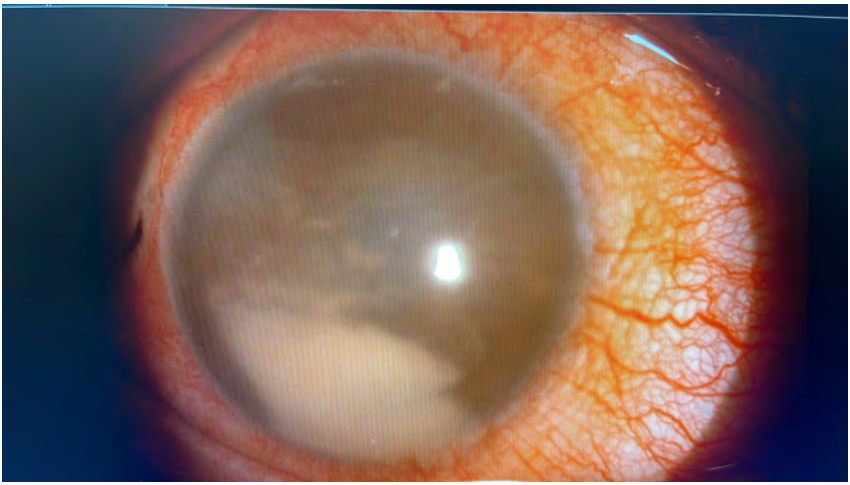

Figure 2. Grade 2 hypopyon in the anterior chamber

MALIGNANT GLAUCOMA AFTER TRABECULECTOMY: A CASE PRESENTATION

Ruma Z

Purpose

To present a case of malignant glaucoma following combined phaco and trabeculectomy in an acute angle closure crisis patient.

Case summary

A 46-year-old woman diagnosed with nuclear cataract with acute angle closure crisis, underwent extracapsular cataract extraction and trabeculectomy with the placement of a 7-mm posterior chamber intraocular lens (IOL) in her left eye. She was on antiglaucoma medication. On the first postoperative day, her visual acuity and intraocular pressure were satisfactory, but there was shallow anterior chamber depth. By the seventh postoperative day, she exhibited sign of malignant glaucoma. Following an attempt with anterior chamber hyalodotomy, and with no improvement, IOL repositioning, and bleb revision were performed on the eighth POD. The patient was subsequently managed with continued antiglaucoma medications and mydriatics.

Conclusion

Malignant glaucoma is not uncommon after a trabeculectomy. Meticulous examination with proper attention and management can restore vision and limit the complications.

CORRELATION OF INTRA OCULAR PRESSURE AND CENTRAL VAULT AFTER IMPLANTATION OF ICL/IPCL WITH A CENTRAL HOLE WITHOUT IRIDOTOMY

Ruma Z, Rahman S, Kawsar U

Introduction

To compare the intraocular pressure (IOP) values before and a 6 months period after implantation of phakic implantable contact lenses (ICL EVO/EVO+, STAAR Surgical, Switzerland / IPCL V2.0, Care Group, India) with a central hole in it in moderate to high myopic patients, and to measure the central vault in each patient to quantify the risk of increasing IOP.

Material and Methods

A prospective study was conducted in the Department of Glaucoma and Refractive Surgery, Vision Eye Hospital, Dhaka from March 2022 to October 15, 2022. A total of 56 eyes of 30 patients were included. All patients were high to moderate myopic and underwent ICL or IPCL implantation surgery after doing all refractive and preoperative investigations including IOP. We measured IOP and vault in postoperative days periodically.

Result

The IOP of both eyes with phakic IOL raised temporarily during the first month after surgeries, especially on the 1st and 7th postoperative day, and came down to the previous level after 3 to 6 months. The vault of eyes were variable from patient to patient but did not significantly affect the postoperative IOP.

Conclusion

IOP was more or less same after a 6-month period of ICL/ IPCL implantation. The vault was variable. Patients with extreme variable vaults were excluded for further follow-up to prevent vault-related complications

INCIDENCE, RISK FACTORS AND OUTCOMES OF ADULT PATIENTS WITH POST-PENETRATING KERATOPLASTY GLAUCOMA IN A TERTIARY PHILIPPINE HOSPITAL

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Introduction

The purpose of this study is to determine the incidence, risk factors and outcomes of adult patients with post-penetrating keratoplasty glaucoma (PPKG) in a tertiary Philippine hospital.

Methods

This is a single centre, retrospective review of medical records of patients who underwent penetrating keratoplasty at Sentro Oftalmologico Jose Rizal, Philippine General Hospital. Study participants included adult patients 18 years old and above who underwent penetrating keratoplasty from January 2017 to December 2021 with at least 3 months of documented postoperative follow-up.

Results

The study included 114 eyes from 114 participants. Sixty-nine participants developed PPKG with an overall incidence of 60.53%. Patient age of less than or equal to 40 years ($p = 0.024$), infectious/inflammatory diagnosis ($p = 0.043$), and tectonic/therapeutic indication ($p = 0.038$) had significantly higher incidences of PPKG. The overall incidence of graft failure among optical grafts was 41.10%. There were no statistically significant differences between graft failure rates ($p = 0.055$), preoperative visual acuities ($p = 0.456$), latest visual acuities ($p = 0.641$) and change in visual acuities ($p = 0.973$) between participants with and without PPKG. There were no statistically significant differences between pre-operative visual acuities ($p = 0.188$), latest visual acuities ($p = 0.428$), change in visual acuities ($p = 0.848$) and number of glaucoma medications on latest follow-up ($p = 0.141$) between the

medical escalation and surgical escalation groups. The surgical escalation group had statistically lower intraocular pressure values on latest follow-up ($p = 0.028$).

Conclusion

Glaucoma is a prominent manifestation among patients who underwent penetrating keratoplasty at the Philippine General Hospital. Significant risk factors for the development of PPKG include younger patient age, infectious/inflammatory disease, and tectonic/therapeutic indication. There were similar visual outcomes and rates of graft failure between participants with and without PPKG. There were also similar visual outcomes and number of glaucoma medications between the medical and surgical escalation groups, but the surgical group had significantly lower intraocular pressure values on latest follow-up.

EVALUATION OF MACULAR GANGLION CELL LAYER + INNER PLEXIFORM LAYER (GCL + IPL) AND CIRCUMPAPILLARY RETINAL NERVE FIBER LAYER (CRNFL) THICKNESS IN GLAUCOMA

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Introduction:

In the Philippines, the concept of macular ganglion cell analysis as an adjunct to glaucoma diagnosis is relatively new compared to circumpapillary retinal nerve fiber layer (cRNFL) thickness analysis. The study aimed to correlate macular ganglion cell layer + inner plexiform layer (GCL + IPL) and cRNFL thickness across different stages of glaucoma and to determine the validity of GCL + IPL in the evaluation of early glaucoma and its progression to moderate-severe stages using the area under the curve (AUC) analysis in comparison to cRNFL.

Methods

We reviewed 260 charts of adult glaucoma suspect and glaucoma patients wherein macular ganglion cell analysis, optical coherence tomography (OCT) of the cRNFL, and automated visual field (AVF) was done. Glaucomatous eyes were further classified into stages based on the Hodapp-Anderson-Parish Visual Field Criteria of Glaucoma Severity. AUC analysis was used to compare GCL + IPL parameters with cRNFL in glaucoma suspects and glaucoma patients.

Results

A total of 122 eyes were included in the study and were grouped into glaucoma suspects (n = 43), mild glaucoma (n = 40), and moderate + severe glaucoma (n = 39). Highest AUC was obtained by minimum GCL + IPL (AUC = 0.859) with cut-off value at ≤ 70 µm in the determination of visual field defects across all glaucoma stages. Average GCL + IPL had the highest AUC (0.835) in detecting progression from

glaucoma suspect to mild glaucoma, while the inferior sector of the cRNFL had the highest AUC (0.937) in discerning progression from mild to moderate-severe glaucoma.

Conclusion

The results of this study highlight the significance of macular ganglion cell analysis in the screening, detection, and monitoring of progression in glaucoma. Compared to cRNFL, macular ganglion analysis may be more beneficial in glaucoma screening and detecting progression from glaucoma suspect to mild glaucoma.

COMPARISON OF SHORT- AND LONG-TUNNEL NEEDLE TRACK FOR AHMED GLAUCOMA VALVE IMPLANTATION IN A PRIVATE EYE CENTER IN THE PHILIPPINES: A RETROSPECTIVE STUDY

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Introduction

In glaucoma drainage device surgery, a gauge-23 (G-23) needle is traditionally used to create a short scleral tunnel 2–3 mm away from the corneal limbus (short needle tract, SNT). A long tunnel variation (long needle track, LNT) has been developed to forego the use of patch grafts and lessen incidence of peritubular leakage. This study aimed to compare the success and complication rates among patients implanted with Ahmed Glaucoma Valve (AGV) using the short and long tunnel technique through retrospective chart review.

Methods

We reviewed 54 charts of adult patients who underwent AGV implantation using SNT or LNT technique. Intraocular pressures (IOP), best-corrected visual acuity (BCVA) and number of medications were recorded preoperatively and at Day 1, 3, 7, Month 1, 3, 6 postoperatively. Treatment success, occurrence of hypertensive phase (HP), complications, and procedures done after AGV implantation were compared between the 2 groups using one-tailed Z-test of proportions.

Results

A total of 20 (LNT) and 21 (SNT) charts were included in the study. There was no significant difference between the median postoperative IOP, BCVA, and number of antiglaucoma medications between the two groups at each time interval. The comparison between the occurrence of HP ($P = 0.435$) and success rates ($P = 0.476$) between the two groups yielded no significant difference. Flat/shallow anterior

chamber (AC) was seen exclusively in 3 eyes (14%) in the SNT group (P = 0.039). There was 1 occurrence of plate exposure in the LNT group (P = 0.149).

Conclusion

The LNT technique of AGV implantation may be used as an alternative to the traditional SNT (with autologous graft). The LNT offers the advantage reducing the risk of complications arising from shallow anterior chamber postoperatively.

MANAGEMENT PATTERNS AND OUTCOMES OF CHILDHOOD GLAUCOMA AT THE PHILIPPINE NATIONAL SPECIALTY CENTER FOR EYE CARE USING THE CHILDHOOD GLAUCOMA RESEARCH NETWORK CLASSIFICATION

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Introduction

Childhood glaucoma is an uncommon and heterogenous ocular condition. The Childhood Glaucoma Research Network (CGRN) Classification was developed to categorise these pragmatically.

Methods

This study was a retrospective chart review where data on the demographic management patterns including the outcomes of intraocular pressures (IOPs) were collected.

Results

A total of 70 eyes were eligible. Patients with glaucoma post-cataract surgery, juvenile open-angle glaucoma (JOAG), glaucoma with non-acquired ocular anomalies, glaucoma with non-acquired conditions were treated medically. In contrast, primary congenital glaucoma (PCG), and glaucoma with acquired conditions were treated surgically. The median IOP at 1 month, 6 months, and 12 months post-treatment were not significantly different between the 2 groups.

Conclusion

Majority of patients were primary glaucomas. Of the secondary glaucomas, glaucoma with acquired conditions was the most frequent, where blunt traumatic injury was the most common aetiology. Primary glaucomas presenting with higher

IOPs compared to secondary glaucomas were surgically managed. Both medical and surgical interventions were effective treatments to achieve complete success of IOP control.

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Tables, Figures, and Illustrations

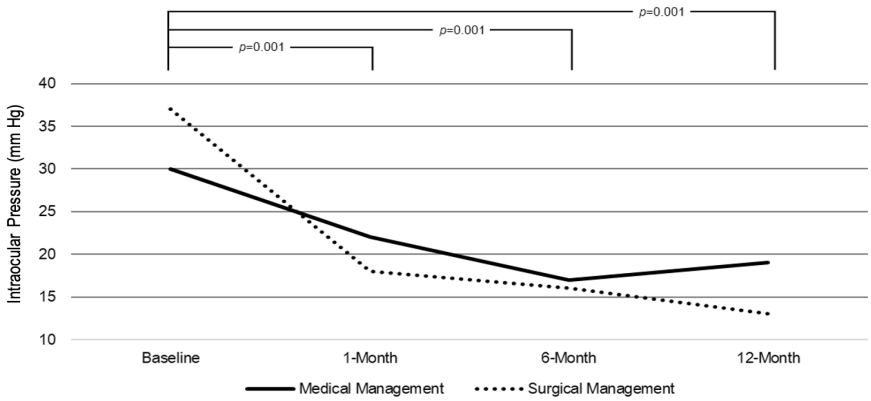

Figure 1. Comparisons of the median intraocular pressure at baseline, 1 month, 6 months, and 12 months.

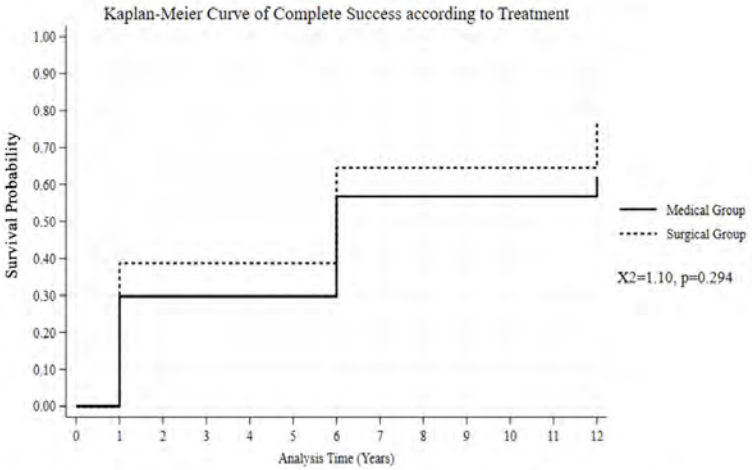

Figure 3. Kaplan-Meier Curve of Complete Success according to the Treatment Group

CLINICAL PROFILE AND MANAGEMENT TRENDS OF ADULT GLAUCOMA PATIENTS IN THE PHILIPPINE NATIONAL SPECIALTY CENTER FOR EYE CARE

Santana K

Background

Glaucoma is one of the leading causes of irreversible blindness and affects 60 million individuals worldwide ranking as the third most common cause of blindness in the Philippines. To date, epidemiologic data of the disease is limited and trends in its management remain undescribed.

Objectives

To determine the 10-year clinical profile and management trends of adult glaucoma patients at the Philippine National Specialty Centre for Eye Care.

Methodology

Clinical charts of adult glaucoma patients from 2013 to 2022 in the Philippine National Specialty Centre for Eye Care were reviewed. Demographic data, diagnosis classification, initial diagnostic modalities, and initial medical and non-medical treatment strategies were collected and analysed.

Results and Conclusion

Two thousand nine hundred and seventy-eight patients were included in the study with a mean age of 60.6 years and slight female preponderance and majority (79.34%) had bilateral disease. A total of 5,052 eyes were analysed. Most eyes had visual acuity better than 20/200 (58.57%) with mean IOP of 26 mmHg and CDR of 0.6. Overall, PACG is the most common classification (48.10%) followed by POAG (56.49%). OCT was the most utilized diagnostic modality overall (53.80%). Majority of cases were treated medically (50.20%) with an average of 2 antiglaucoma medications. Beta-blockers were the most commonly used medications (46.37%). Among non-medical treatments, phacoemulsification was mostly utilized (29.59%)

with an increasing trend accompanied by decreasing trabeculectomy utilization in PACG. SLT was the most utilized (14.89%) in POAG with an increasing trend.

ULTRASOUND CYCLOPLASTY (UCP) FOR IOP REDUCTION OF GLAUCOMA PATIENTS: CASE SERIES

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Introduction

Intraocular pressure (IOP) lowering is still the mainstay strategy for the control and treatment of glaucoma in order to prevent further progression of damage to the optic nerve. Conventional means to control IOP include hypotensive medications, laser procedures, surgery, and ciliary body destruction. Ultrasound cycloplasty (UCP) is a recently developed procedure to lower IOP through the use of selective and controlled coagulation of the ciliary body using high-intensity focused ultrasound.

Methods

This study included 6 patients with open- and closed-angle glaucoma showing episodes of fluctuating IOP. All procedures were performed using the EyeOP1 device (Eye Tech Care). Patients were then monitored on 1-day, 7-day, 30-day, 60-day and 90-day post procedure.

Results

Preoperative IOP for the 6 patients ranged from 20 mmHg to 30 mmHg. All 6 patients were noted to have decreased IOP postoperatively ranging from 8 mmHg to 17 mmHg during the follow-ups, showing at least 30% IOP reduction in all cases. Two of the patients were able to remove at least 1 hypotensive eye drops during subsequent consults. No major intra- or postoperative complications occurred.

Conclusion

UCP has shown to be a viable non-invasive alternative for the management of glaucoma patients. IOP reduction was relatively maintained throughout the 90-day follow-up period, and no major complications occurred.

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NEUROLOGIC AND SYSTEMIC COMPLICATIONS OF HERPES ZOSTER OPHTHALMICUS

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Introduction

Herpes zoster ophthalmicus can lead to orbital apex syndrome. If left untreated, it can further cause viral meningitis and cerebrovascular disease. Thus, it is imperative that herpes zoster ophthalmicus be promptly diagnosed and treated.

Methods

Orbital apex syndrome is a rare neuro-ophthalmic manifestation of herpes zoster virus infection. Two of its consequences if left untreated are viral meningitis and cerebrovascular disease. Early diagnosis and treatment of herpes zoster ophthalmicus is crucial so as to avoid more life-threatening systemic and neurologic complications.

Results

This is a case of a 74-year-old female who consulted for vesicular rashes on the right peri-ocular area. History revealed that 2 weeks prior to consult, patient noted appearance of vesicular, painful rashes on her forehead, right periorbital area, extending to the lateral tip of her nose. A mixture of herbs topically applied offered no relief. There was gradual right visual loss, with conjunctival hyperaemia, ptosis, and limitation of eye movement. Ophthalmological and neurological evaluation showed the following: complete ptosis right with limited eye movement, negative light perception, non-reactive pupils, and recurrent hyphaema. There was also decrease sensorium and right-sided body sensorimotor weakness. Lumbar tap yielded elevated protein and lymphocytes. Cavernous sinus thrombosis was seen with neuroimaging. A diagnosis of orbital apex syndrome with meningitis secondary to herpes zoster ophthalmicus was then established. Patient was treated with

topical and intravenous acyclovir and pregabalin. There was improvement after 3 weeks except for vision which remained negative, persistence of the limited eye movement and ptosis.

Conclusion

It is necessary to consider the possibility of orbital apex syndrome development in patient with herpes zoster ophthalmicus. Furthermore, cerebrospinal studies and MRI will help select a treatment method. Prompt treatment should be initiated to avoid systemic complications.

COMPARISON IN MEAN DEVIATION SLOPE BETWEEN BEFORE AND AFTER TRABECULECTOMY IN EYES WITH OPEN-ANGLE GLAUCOMA

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Purpose

To compare mean deviation (MD) slope between before and after trabeculectomy with intraoperative use of mitomycin C (MMC).

Methods

We retrospectively investigated 1,286 eyes of 1,948 patients with primary open-angle glaucoma including normal-tension glaucoma and exfoliative glaucoma, who received trabeculectomy with MMC. Inclusion criteria were: postoperative follow-up periods ≥ 10 years, preoperative MD > -20 decibels (Humphrey Field Analyzer program Central 30-2), and reliable both pre- and postoperative visual field results ≥ 10 times. We reviewed the patients' data including IOP and visual field from our records. A regression analysis was conducted to assess a relationship between percent reduction of IOP from baseline value and MD slope.

Results

Finally, 31 eyes met the inclusion criteria. The mean age at surgical intervention was 56.1 ± 11.7 years. Men were 18 and women were 13. The mean pre- and postoperative follow-up period was 6.9 ± 2.9 and. 19.3 ± 4.9 years. The preoperative IOP was 18.4 ± 3.0 mmHg. The postoperative IOP reduced significantly to 11.2 ± 2.1 mmHg ($P < 0.001$; paired *t*-test), and percent IOP reduction from baseline was 38.4 ± 11.6 %. The eyes with a percent IOP reduction below 20% and 30% were 3 and 7 eyes, respectively. The pre- and postoperative MD slope was -0.75 ± 0.82 and -0.19 ± 0.24 decibel/year ($P < 0.001$; paired *t*-test). The postoperative MD slope was significantly correlated with the percent IOP reduction from baseline ($r = 0.341$, $P < 0.014$; Pearson correlation coefficient).

Conclusion

Long-term IOP stability obtained by trabeculectomy can preserve the visual field in glaucoma.

COMPARATIVE ANALYSIS OF PRIMARY COMBINED TRABECULOTOMY WITH TRABECULECTOMY IN EARLY ONSET GLAUCOMA: PHACOMATOSIS PIGMENTOVASCULARIS VS STURGE-WEBER SYNDROME

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Introduction

Early onset glaucoma can occur in infants with Sturge-Weber syndrome (SWS) and phacomatosis pigmentovascularis (PPV).[1,2] The following study has tried to compare efficacy of primary combined trabeculotomy with trabeculectomy (CTT) in management of these 2 conditions.

Methods

This retrospective study aims to compare the outcomes of CTT in children with early onset glaucoma associated with PPV and SWS. A total of 49 eyes (49 children) with SWS and 48 eyes (32 children) with PPV were included, all of whom underwent primary CTT with a minimum of 1 year of postoperative follow-up.

Results

Preoperative ocular parameters, including intraocular pressure (IOP), corneal diameter, corneal clarity, preoperative number of medications, and cup-disc ratio, were similar in both groups ($p > 0.05$). However, the age at presentation and surgery was significantly lower in the PPV group (0.2 vs. 0.57 years, $p = 0.01$). Systemic issues, such as epilepsy, were more prevalent in the PPV group (33% vs. 14%, $p = 0.02$), with a higher incidence of abnormal MRI findings (31% vs. 20%, $p = 0.22$). After a median follow-up of over 5 years, the IOP at the last follow-up was comparable, but the complete success probability was higher in the SWS group ($p = 0.03$). Notably, the PPV group exhibited a higher number of glaucoma medications ($p = 0.01$) and an increased need for repeat glaucoma surgery ($p = 0.01$). While postoperative

complications were slightly elevated in the PPV group, statistical significance was not reached ($p = 0.31$).

Conclusion

The study suggests that CTT as a primary procedure yields better outcomes in SWS compared to PPV. Additionally, systemic issues were significantly more prevalent in the PPV group. These findings contribute valuable insights into the management of early onset glaucoma associated with these distinct conditions.

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OUTCOMES OF GONIOSCOPY ASSISTED TRANSLUMINAL TRABECULOTOMY IN EYES WITH PRIOR FAILED GLAUCOMA SURGERY

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Introduction

Trabeculectomy and glaucoma drainage implants (GDD) are commonly performed glaucoma surgeries. However, failure of surgery due to long-term fibrosis and scarring necessitates additional surgeries. Angle-based procedures as emerging as important alternatives in open angles with failed previous filters before additional tube surgery.

Methods

The study involved 30 eyes of 30 patients, all of whom exhibited open angles on gonioscopy, had experienced prior glaucoma surgery failures, and subsequently underwent gonioscopy-assisted transluminal trabeculotomy (GATT). The primary outcome measure was success defined as complete when the intraocular pressure (IOP) was > 5 and ≤ 21/16 mmHg without glaucoma medications and qualified with medications.

Results

Twenty-one eyes underwent GATT and remaining 9 eyes underwent Phaco-GATT. The mean age was 51.8 ± 16.1 years. Twenty-seven eyes had failed trabeculectomy and 3 eyes had failed GDD. Post GATT, the IOP decreased from 27.1 ± 7 to 16 ± 3.8 mmHg ($P < 0.001$), with a mean drop in AGM from 4.9 ± 1.0 to 1.4 ± 1.6. At postoperative 1-year, the probability of complete success was 25% (95% confidence interval: 12, 49] for an IOP criterion of both 21 and 16 mmHg. The qualified success probability at 1- year was 96% (89, 100) for an IOP criterion of 21 mmHg and 57% (38, 84) for an IOP criterion of 16 mmHg. Risk factors for failure were older age (hazard ratio (HR) 1.05, 95% CI 1.01, 1.08) and higher preoperative IOP (HR 1.1, 95%

CI 1.02–1.2). A transient complication observed was hyphaema in 14 eyes (46.6%), all of which resolved within 1 week.

Conclusion

This study concludes that GATT is an effective surgical alternative for IOP control in eyes with prior failed glaucoma surgeries and safe with transient complications.

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INFLAMMATORY GLAUCOMA: MEET THE CHALLENGE

Shahid Z

Inflammatory glaucoma is a challenging condition that requires careful management and treatment. This case study focuses on a patient diagnosed with inflammatory glaucoma and highlights the challenges faced by both the patient and the healthcare team. The patient, a 55-year-old male, presented with complaints of blurred vision, eye pain, and redness in the right eye. Upon examination, I noted elevated intraocular pressure (IOP) and signs of inflammation in the anterior segment of the eye. The patient was diagnosed with secondary inflammatory glaucoma. Primary challenges in managing this inflammatory glaucoma were controlling the inflammation while also reducing the intraocular pressure. The inflammatory process leads to peripheral anterior synechia and blockage of the eye's drainage system, resulting in increased IOP. Therefore, a multidisciplinary approach involving rheumatologists, and vitreoretinal specialists was taken. Topical and systemic anti-inflammatory medications, such as corticosteroids, were used. After 1 month, use of corticosteroids caused increased intraocular pressure and cataract formation. I carefully monitored the patient's IOP and adjusted the dosage and frequency of anti-inflammatory medications to control the inflammation while minimising the risk of elevated IOP. My team provided support and counselling to help the patient cope with the emotional and psychological impact of living with a chronic eye condition. In conclusion, managing inflammatory glaucoma is a complex and challenging task that requires a multidisciplinary approach. Through close monitoring, effective treatment, and patient education, the challenges posed by inflammatory glaucoma can be met and overcome.

RISK OF COMORBID GLAUCOMA IN PATIENTS WITH CHRONIC KIDNEY DISEASE: A 12-YEAR NATIONWIDE COHORT STUDY IN TAIWAN

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Introduction

Glaucoma, a leading cause of irreversible blindness, is associated with intraocular pressure (IOP) and risk factors other than IOP, such as impaired microvascular circulation and oxidative stress or hypoxia. Chronic kidney disease (CKD), a widespread microvascular disorder, has connections to various eye conditions through shared metabolic and cardiovascular risk factors and potential mechanisms. Population-based studies suggest a positive association between CKD and OAG, but conflicting results exist. This study aims to investigate the risk of glaucoma development in patients with CRD.

Methods

The present retrospective cohort study gathered data was collected from the Taiwan National Health Insurance system. The CKD group, consisting of 723,216 patients initially diagnosed with CKD between 2009 and 2015, underwent analysis alongside a non-CKD group of 723,216 meticulously matched comparisons. Each group subject was followed until 2019. Multivariate Cox proportional hazard regression analysis was used to compare the risk of glaucoma development between the 2 groups.

Results

Using Kaplan–Meier survival statistics (Fig. 1), crude overall survival curves showed that cumulative incidence of glaucoma was significantly higher in the CKD group (log-rank test $P < 0.001$, Fig. 1). When comparison of CKD group and non-CKD group was stratified by gender, age, and comorbidities (hypertension, diabetes,

hyperlipidaemia, stroke, and dementia), the higher risk of glaucoma in patients with CKD remained significant in all subgroups. Furthermore, the Cox proportional hazard regression model indicated a higher risk of glaucoma in patients with end-stage renal disease (ESRD) compared to those with CKD after adjusting for confounding factors, both in peritoneal dialysis (PD) (HR = 1.67, 95% CI 1.52~1.83) and haemodialysis (HD) (HR = 1.67, 95% confidence interval (CI) 1.61~1.73) (Table 1).

Conclusion

This study provides evidence supporting association between CKD and glaucoma. Moreover, our findings demonstrate a particularly heightened risk of glaucoma in patients with end-stage renal disease.

Figures

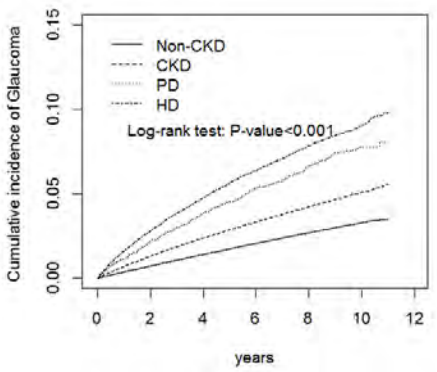

Table. Incidence and hazard ratios (HR) of Glaucoma estimated by chronic renal failure of Cox proportional hazards models between the CKD and non-CKD cohorts

Variable	Event	IR	Crude HR (95% CI)	P-value	Adjusted HR (95% CI)	P-value	Adjusted HR (95% CI)	P-value
Non-CKD	16515	3.41	1 (Reference)		1 (Reference)			
CKD	19283	5.60	1.62(1.58, 1.65)	<0.001	1.22(1.20, 1.25)	<0.001	1 (Reference)	
ESRD								
PD	442	8.61	2.53(2.30, 2.78)	<0.001	1.96(1.78, 2.16)	<0.001	1.67(1.52, 1.83)	<0.001
HD	3968	10.7	3.10(3.00, 3.21)	<0.001	1.98(1.91, 2.06)	<0.001	1.67(1.61, 1.73)	<0.001

IR, incidence rate, per 1000 person-years; HR, hazard ratio; † : multivariable analysis including sex, age, income, urbanization and comorbidities of hypertension, diabetes mellitus, hyperlipidemia, stroke, and dementia.

CASE REPORT: CIRCUMFERENTIAL 360° SUTURE TRABECULOTOMY IN PRIMARY CONGENITAL GLAUCOMA

Sim S[1], Clement C[2]

[1]Khmer Soviet Friendship Hospital, [2]Sydney Eye Hospital

Introduction

Circumferential 360° trabeculotomy is a further development of standard trabeculotomy. The procedure is performed by rupturing the entire circumference of the TM and the inner wall of Schlemm's canal using a polypropylene suture. In the retrospective study, Beck and Lynch report on 12 months results with 85% success of this procedure, which is better control in IOP than goniotomy or standard trabeculotomy.

Methods

A 7-year-old girl presented with buphthalmic eye and elevated intraocular pressure in the left eye. Despite the presence of cornea hazy, ab externo 360° suture trabeculotomy was performed successfully. Success was defined as intraocular pressure ≤ 16 mmHg without or with glaucoma medication.

Results

The postoperative intraocular pressure was 10 mmHg. Subsequently, the cornea was clear with a deep anterior chamber. Three months after the surgery the intraocular pressure was 13 mmHg without additional glaucoma medication.

Conclusion

Circumferential 360° suture trabeculotomy may be successful with primary congenital glaucoma, especially when angle structure are not visible. It is an efficacious, safe and medication saving surgical treatment for primary congenital glaucoma in the long term.

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EFFICACY AND SAFETY OF THE PRESERFLO IMPLANT WITH MITOMYCIN C IN REFRACTORY CHILDHOOD GLAUCOMA: CASE REPORT

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Introduction

In refractory childhood glaucoma, treatment options are trabeculectomy and glaucoma drainage devices. However, these procedures can induce severe side effects such as endophthalmitis, haemorrhages and lingering hypotony. PreserFLo Microshunt is an ab externo surgical device that creates a new outflow pathway to aqueous humour into the subconjunctival space with reducing the risk of post-surgical inflammation and complications.

Methods

A 12-year-old boy presented with refractory childhood glaucoma. PreserFlo was implanted with adjunctive MMC0.4 mg/ml) in both eyes under general anaesthesia. Intraocular pressure and complications were observed until 3 months postoperation.

Results

One day after surgery, intraocular pressure was 8 mmHg in the right eye and 10 mmHg in the left eye. Slit lamp showed negative Seidel sign with no wound leakage and bleb was present. Anterior chamber was deepened with no choroidal detachment. At the 3-month follow-up, the pressure was varied between 10 mmHg to 13 mmHg with no additional glaucoma medications. There were no cornea or lens- related opacities.

Conclusion

PreserFlo with MMC can be used successfully to treat uncontrolled IOP in childhood glaucoma. It is a safe and effective for option surgical management of glaucoma which may prove useful in advance refractory glaucoma.

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ASSESSING THE PROGNOSTIC SIGNIFICANCE OF CYP1B1 VARIANTS IN CHILDHOOD GLAUCOMA: INSIGHTS FROM A PROSPECTIVE COHORT STUDY

Singh A

Purpose

This prospective cohort study aimed to investigate various *CYP1B1* genetic variants identified in a cohort of children with non-acquired glaucoma (NAG) and examine their correlation with the phenotype and clinical outcomes.

Methods

Children who presented with newly diagnosed NAG between January 2021 and January 2023 underwent targeted gene capture sequenced on an Illumina sequencing platform (CES). Sequences were aligned to the human reference genome (GRCh38.p13). The pathogenicity of variants was determined using ACMG guidelines and targeted variant analysis was done by PCR and Sanger sequencing. Children harbouring *CYP1B1* variants and completing a minimum 6-month postoperative follow-up were included. We correlated the genetic variants to the phenotype and outcome.

Result

A total of 175 children were analysed, of which 126 (72.0%) harboured genetic variants. Of these, 98 (77.8%) matched the phenotype classified as pathogenic. Of these pathogenic variants, 52 (53.1%) were *CYP1B1.* Among these, 34(65.38%) had the c.1169G>A (p.Arg390His) variant. All 25 children with homozygous c.1169G>A (p.Arg390His) variants and 5 with compound heterozygous variants had a common phenotype: neonatal-onset congenital ectropion uveae (NO-CEU), with a scarred cornea suggestive of *CYP1B1* keratopathy. Eleven of fifty-two 1152 (21.15%) children harboured the c.1103G>A (p.Arg368His) variant and they had better corneal clarity at presentation and showed favourable outcomes. The remaining children had mixed variants with no definite phenotype or consistent outcomes.

Conclusions

Our study identified 1 uniformly poor prognosis variant and 1 variant that potentially indicates a favourable prognosis. These findings provide valuable insights into the prognostic significance of *CYP1B1* variants and highlight the potential of CES as a diagnostic tool for childhood glaucoma.

CONGENITAL GLAUCOMA AS A PRESENTING FEATURE OF FRANK–TER HAAR SYNDROME: IMPORTANCE OF SYSTEMIC AND GENETIC EVALUATION IN CHILDHOOD GLAUCOMA

Singh A

Purpose

To present a case of bilateral refractory glaucoma in a child with Frank-Ter Haar syndrome.

Case

A 2-month-old male baby presented with bilateral cloudy corneas since birth. On examination, the child had bilateral grade III corneal haze with enlarged cornea, and limbal stretching. The intraocular pressure on the I-Care tonometer was 32 mmHg in both eyes. Axial length was 22.20 mm and 21.44 mm in the right and left eye, respectively. CDR of 0.8–0.9 was also present in both eyes. We noted that the child also had frontal bossing with brachycephaly and mid-facial hypoplasia. Differential diagnoses were either neonatal onset primary congenital glaucoma or glaucoma associated with non–acquired systemic anomalies.

The patient was started on topical antiglaucoma medications and underwent bilateral angle surgeries. The patient was referred to a paediatrician for a thorough systemic evaluation. Meanwhile, he also underwent clinical exome sequencing. Systemic evaluation revealed brachycephaly, frontal bossing, wide fontanelle, hypertelorism, prominent subocular folds, flat nasal bridge with anteverted nostrils, full cheeks, posteriorly rotated ears, thin upper lip, and long philtrum. Oral cavity examination showed gingival hyperplasia and deep palate. The child also had skeletal deformities in the form of clinodactyly and flexion deformity of fingers. Echocardiography showed a patent ductus arteriosus (PDA) with left to right shunt (3.5mm). The rest of the systemic evaluation was within normal limits.

Genetics report showed a homozygous, pathogenic mutation in the *SH3PXD2B* gene located on chromosome 5 with autosomal recessive inheritance consistent with a rare syndrome named Frank-Ter Haar syndrome (FTH).

Follow-Up

Glaucoma was not controlled, and the child underwent bilateral limited DLCP and later on had to undergo bilateral CTT. With age, coarsening of facial features was noted. The size of PDA has been decreasing, and the child is under paediatric and cardiology follow-up.

Discussion

FTH syndrome is a rare, autosomal recessive genetic disorder characterized by craniofacial anomalies with skeletal, cardiovascular, and ocular abnormalities with or without glaucoma and variable developmental delay. It may be life-threatening in some patients.

Conclusion

Comprehensive ocular and systemic evaluation along with genetics analysis in all cases of congenital glaucoma becomes extremely important, especially cases which initially mimic PCG.

OUTCOME OF MITOMYCIN C AUGMENTED FIBROTIC CAPSULAR EXCISION FOR BAEVELDT GLAUCOMA DRAINAGE DEVICE

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[1]Siriraj Hospital

Introduction

Fibrotic encapsulation around the plate of glaucoma drainage device (GDD) is claimed to be an important factor associated with hypertensive phase and the failure after GDD implantation. Several procedures have been reported to manage the GDD failure. This study aims to report the efficacy and the safety of mitomycin C (MMC) augmented fibrotic capsular excision (FCE) for Baeveldt GDD (350 mm) implantation in Siriraj hospital.

Methods

This is a retrospective chart review of 5 eyes of 5 consecutive open-angle glaucoma (OAG) patients (3 juvenile OAG) who underwent MMC augmented FCE between January 2009 to December 2019. The demographic characteristics, underlying diseases, best-corrected visual acuity (BCVA), intraocular pressure (IOP), ophthalmoscopic findings, the number of antiglaucoma medications, complications, and interventions were collected preoperatively and at 6 months after procedure.

Results

There were 4 males and 1 female with the mean age of 48 years included in the study. Four patients had pre-existing corneal decompensation. Mean time between GDD implantation and MMC augmented FCE was 7.5 years (range 7.3–13.5 years). The mean preoperative IOP and anti-glaucoma medication were 22.0 mmHg and 3 compared to 23.2 mmHg and 2.6 respectively at 6 months postoperatively. At 6 months postoperatively, 1 patient experienced significant decrease of BCVA and

only 1 patient had IOP less than 21 mmHg. Two patients underwent laser diode cyclophotocoagulation.

Conclusion

This cases series demonstrated a promising success of MMC augmented FCE which was lower than previous reports. The longer time after GDD implantation to the FCE procedure and the short-term follow-up after FCE may be the significant factors for failure in this study. A larger sample size study should be conducted to clarify the risks/ benefits of MMC-augmented fibrotic capsular excision after GDD implantation in long-term follow-up.

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Tables

Treatment outcome of fibrotic capsule excision with MMC after **failure of Baeveldt shunt implantation**

Age	Sex	Laterality	Comorbidity	Duration before operation (months)	Glaucoma type	Pre-op			Post-op day1			Post-op 1 wk			Post-op 1m		
						VA	IOP	No. Med	VA	IOP	No. Med	VA	IOP	No. Med	VA	IOP	
34	M	L	Post corneal transplant	99 m	JOAG	0.9	23	3	HM	4	0	HM	16	2	HM	16	
75	M	L	Post corneal transplant	17 m	POAG	HM	25	5	HM	14	0	HM	15	0	HM	22	
39	M	L	Corneal decompensation	84 m	JOAG	0.9	22	1	HM	18	2	HM	26	3	HM	9	
61	M	R	Failed trabeculectomy	88 m	POAG	0.39	20	3	FC1'	8	0	0.8	14	0	0.39	18	
31	F	L	Corneal decompensation	162 m	JOAG	HM	20	3	HM	17	3	HM	17	3	HM	18	

Abbreviation: M = male, F = female, R = right eye, L = left eye, JOAG = Juvenile Open Angle Glaucoma, POAG = Primary Open Angle Glaucoma, VA = logMAR: logarithmic minimum angle of resolution), IOP = intraocular pressure, ECP = Endoscopic cyclophotocoagulation

COMPARING THE SAFETY AND EFFICACY OF COMBINED TRABECULOTOMY AND TRABECULECTOMY (CTT) WITH AND WITHOUT OLOGEN® IN PEDIATRIC PRIMARY CONGENITAL AND INFANTILE GLAUCOMA

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Introduction

The most effective form of treatment for Primary congenital glaucoma (PCG) is combined trabeculotomy and trabeculectomy (CTT).[1] Mitomycin C might enhance the success of this procedure, but with associated risk of complications.[2] Ologen, a biodegradable collagen matrix, is an alternative wound modulator. Studies have shown good safety and efficacy of Ologen® as compared to MMC in CTT for treatment of PCG.[3]

Methods

Fifty-five eyes from 55 children aged 1 month to 3 years were enrolled in the study, with patients randomized into 2 groups. Group A (34 eyes) underwent CTT, while Group B (21 eyes) CTT with adjuvant Ologen® Collagen Matrix. Minimum follow-up was 12 months, during which IOP, corneal clarity, and the number of antiglaucoma medications (AGMs) were assessed at each visit.

Results

The median age at the time of surgery was 4 months for both groups. Baseline measures, including median IOP, corneal diameter, and corneal clarity were similar between the 2 groups (P = 0.2). After 12 months, there was no significant difference (p = 0.4) in IOP between both groups. Both groups had a median number of AGMs of 0, and grade 1 corneal clarity. The complete success rate was 87% for Group A and 78% for Group B, while the qualified success rate was 93% for Group A and 94% for Group B. Six eyes in each group required topical AGMs, with no sight-threatening complications, and none of them necessitated repeat surgery.

Conclusion

Both surgical procedures, CTT alone and CTT combined with Ologen, demonstrated similar success rates as primary interventions for primary congenital and infantile glaucoma at the 1-year follow-up. The study found no additional benefits associated with the adjuvant use of Ologen when employed alongside CTT.

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TWO-YEAR RESULTS OF A MULTICENTER STUDY: INTRAOCULAR PRESSURE LOWERING EFFECT OF PHACOEMULSIFICATION, GONIOSYNECHIALYSIS, AND GONIOTOMY FOR PATIENTS WITH ADVANCED PRIMARY ANGLE-CLOSURE GLAUCOMA WITH CATARACTS

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Introduction

To evaluate the 2-year surgical outcome of intraocular pressure (IOP)-lowering effect of combined phacoemulsification with intraocular lens implantation (PEI), goniosynechialysis (GSL), and 120-degree goniotomy (GT) in eyes of advanced primary angle-closure glaucoma (PACG) with cataract.

Methods

Multicentre, prospective observational study. We enrolled 201 eyes of 196 patients with advanced PACG who received combined PEI+GSL+GT. Each patient was assessed before treatment and 1 day, 7 days, 1 month, 3 months, 6 months, 12 months, and 24 months post-surgery. The number of topical hypotensive

medication, surgical complications as well as achievements of surgery success were also evaluated.

Results

All participants completed the 2-year of follow-up. The mean preoperative and postsurgical IOPs were 33.0 ± 10.7 mmHg and 13.6 ± 2.9 mmHg, respectively. Before surgery the participants used an average of 2.4 types of topical hypotensive medications, which decreased to 0.4 after surgery. Major postoperative complications included hyphaema (n = 14, 7.0%), IOP spike (n = 9, 4.9%), and corneal oedema (n = 23, 11.4%). Among all participants, 146 out of 201 eyes (72.6%) achieved complete success, and 184 out of 201 eyes (91.5%) achieved qualified success. None of the eyes required reoperation or developed severe vision-threatening complications.

Conclusion

Over a 2-year follow-up period, PEI+GSL+GT has been proved to be effective and safe in treating advanced PACG with cataract. This combined surgery ought to be considered as the first-line treatment for these patients.

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INFLUENCE OF GONIOTOMY SIZE ON TREATMENT SAFETY AND EFFICACY FOR PRIMARY OPEN-ANGLE GLAUCOMA: A MULTICENTRE STUDY

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Introduction

To compare the efficacy and safety of 120-, 240-, and 360-degree goniotomy (GT) with or without phacoemulsification with intraocular lens implantation (PEI) for patients with primary open-angle glaucoma (POAG).

Methods

Multicentre, retrospective, comparative, nonrandomised interventional study. Patients diagnosed with POAG who underwent GT with or without PEI were included, and divided into 6 groups: 1) standalone 120-degree GT (120GT); 2) standalone 240-degree GT (240GT); 3) standalone 360-degree GT (360GT); 4) PEI + 120GT; 5) PEI + 240GT; and 6) PEI + 360GT. Data on intraocular pressure (IOP), the number of ocular hypotensive medications, and complications were collected and compared. Success was defined as a postoperative IOP within the range of 6 to 18 mmHg and a 20% reduction from baseline without further glaucoma surgery. Complete success and qualified success were defined as the above without and with ocular hypotensive medications, respectively.

Results

Three hundred eight eyes of 231 patients were included with a mean follow-up of 14.4 ± 8.6 months (6.0–48.0 months). There were no significant differences in the reductions in IOP, number of medications, and cumulative survival probability for complete and qualified success rates among the 3 groups of standalone GT and PEI + GT. The 360GT group had the highest proportion of hyphaema with or without PEI.

Conclusion

120GT, 240GT, and 360GT with or without PEI showed similar efficacy in reducing IOP and medications used in POAG. 360GT with or without PEI was more likely to cause hyphaema compared with 120GT or 240GT. 120GT with or without PEI was sufficient for treating POAG with or without cataract.

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Tables, Figures, and Illustrations

TABLE 1. Baseline Demographic and Ocular Characteristics of Patients.

Characteristics	Standalone GT				PEI + GT			
	120 Degrees	240 Degrees	360 Degrees	*P* Value[a]	120 Degrees	240 Degrees	360 Degrees	*P* Value[b]
Eyes (n)	32	59	72		61	30	54	
Age (y)	51.9 ± 12.0	51.7 ± 10.3	48.6 ± 14.2	.897	68.7 ± 10.2	65.4 ± 12.4	66.2 ± 8.8	.146
Male/female	21/11	41/18	51/21	.614	35/26	13/17	32/22	.871
Right/left	15/17	29/30	34/38	.977	27/34	19/11	31/23	.152
LogMAR BCVA	0.8 ± 0.9	0.1 ± 0.4	0.4 ± 0.6	**.090**[c]	0.7 ± 0.6	0.7 ± 0.7	0.6 ± 0.5	**<.001**[c]
Visual field MD (dB)	−17.0 ± 11.2	−11.0 ± 9.8	−17.2 ± 9.0	**<.001**[c]	−16.4 ± 10.0	−20.9 ± 8.6	−17.2 ± 9.2	**<.001**[c]
Stage of glaucoma, n (%)				—				—
Mild	6 (18.7)	23 (39.0)	6 (8.3)		13 (21.3)	1 (3.3)	8 (14.8)	
Moderate	4 (12.5)	15 (25.4)	16 (22.2)		9 (14.8)	4 (13.3)	12 (22.2)	
Severe	22 (68.8)	21 (35.6)	50 (69.5)		39 (63.9)	25 (83.3)	34 (63.0)	
ECD (cells/mm^2)	2653.3 ± 225.3	2500.3 ± 307.2	2689.8 ± 410.2	**.008**[c]	2657.4 ± 330.5	2544.6 ± 230.7	2688.4 ± 291.7	.638
Follow-up (months)	13.9 ± 5.4	7.0 ± 2.6	18.5 ± 9.4		14.1 ± 5.6	9.5 ± 4.3	20.2 ± 10.1	

BCVA = best-corrected visual acuity; ECD = endothelial cell density; GT = goniotomy; LogMAR = logarithm of minimum angle of resolution; MD = mean deviation; PEI = phacoemulsification with intraocular lens implantation.
[a]Indicates the comparison among standalone 120-degree GT, standalone 240-degree GT, and standalone 360-degree GT
[b]Indicates the comparison among PEI + 120-degree GT, PEI + 240-degree GT, and PEI + 360-degree GT.
[c]Statistically significant.

TABLE 2. Intraocular Pressure and Reduction of Intraocular Pressure in 6 Groups.

Measure	Standalone GT				PEI + GT			
	120 Degrees	240 Degrees	360 Degrees	*P* Value[a]	120 Degrees	240 Degrees	360 Degrees	*P* Value[b]
Baseline IOP (mm Hg)	29.9 ± 8.6	25.4 ± 7.7	26.7 ± 8.5	.383	25.1 ± 7.8	26.4 ± 8.8	27.8 ± 7.3	.054
IOP at final visit (mm Hg)	16.2 ± 3.5	15.1 ± 4.2	15.8 ± 3.0	.524	15.8 ± 4.3	14.4 ± 3.6	15.9 ± 5.1	.378
Reduction of IOP (mm Hg)	13.7 ± 10.9	10.3 ± 8.6	11.0 ± 8.5	.333	9.4 ± 9.3	12.0 ± 9.9	11.9 ± 9.6	.253
P value[c]	**<.001**[d]	**<.001**[d]	**<.001**[d]		**<.001**[d]	**<.001**[d]	**<.001**[d]	

GT = goniotomy; IOP = intraocular pressure; PEI = phacoemulsification with intraocular lens implantation.
[a]Indicates the comparison among standalone 120° GT, standalone 240° GT and standalone 360° GT
[b]Indicates the comparison among PEI+120° GT, PEI+240° GT and PEI+360° GT
[c]Indicates the comparison of IOP between the baseline and the final visit
[d]Statistically significant.Adjusted for confounding factors, including logarithm of the minimum angle of resolution, best-corrected visual acuity, mean deviation, and endothelial cell density.

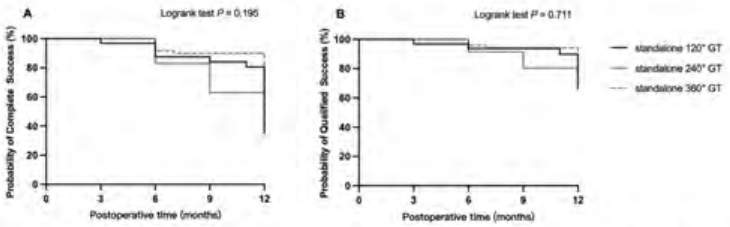

FIGURE 1. Kaplan-Meier survival curves for the 3 groups of standalone goniotomy (GT). There were no significant differences among the 3 groups for cumulative survival probability for complete success (A) and qualified success (B). The cumulative survival probability for complete success at 12 months postoperatively were 35.1%, 46.1%, and 45.0% in the standalone 120-, 240-, and 360-degree GT group, respectively. The cumulative survival probability for qualified success at 12 months postoperatively were 66.4%, 75.1%, and 71.5% in the standalone 120-, 240-, and 360-degreef GT group, respectively.

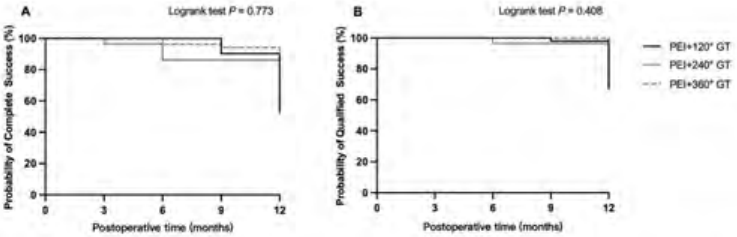

FIGURE 2. Kaplan-Meier survival curves for the 3 groups of phacoemulsification with intraocular lens implantation plus goniotomy (PEI + GT). There were no significant differences among the 3 groups for cumulative survival probability for complete success (A) and qualified success (B). The cumulative survival probability for complete success at 12 months postoperatively were 52.9%, 61.6%, and 51.4% in the PEI + 120-degree GT, PEI + 240-degree GT, and PEI + 360-degree GT groups, respectively. The cumulative survival probability for qualified success at 12 months postoperatively were 67.0%, 82.7%, and 79.5% in the PEI + 120GT, PEI + 240GT, and PEI + 360GT group, respectively.

ONE-YEAR SURGICAL OUTCOME OF COMBINED SURGICAL PERIPHERAL IRIDECTOMY, GONIOSYNECHIALYSIS, AND GONIOTOMY FOR ADVANCED PACG WITHOUT CATARACT

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Introduction

To evaluate the efficacy and safety of surgical peripheral iridectomy (SPI), goniosynechialysis (GSL), and goniotomy (GT) in advanced primary angle-closure glaucoma (PACG) eyes without cataract.

Methods

A prospective, multicentre, observational study was performed for patients who underwent combined SPI, GSL, and GT for advanced PACG without cataract. Patients were assessed before and after the operation. Complete success was defined as achieving intraocular pressure (IOP) between 6 mmHg and 18 mmHg with at least a 20% reduction compared to baseline, without the use of ocular hypotensive medications or reoperation. Qualified success adopted the same criteria but allowed medication use. Factors associated with surgical success were analysed using logistic regression.

Results

A total of 61 eyes of 50 advanced PACG were included. All participants completed 12 months of follow-up. Thirty-six eyes (59.0%) achieved complete success, and 56 eyes (91.8%) achieved qualified success. Preoperative and postsurgical mean IOPs at 12 months were 29.7±7.7 and 16.1±4.8 mmHg, respectively. The average number of ocular hypotensive medications decreased from 1.9 to 0.9 over 12 months. The primary complications included IOP spike (n = 9), hyphaema (n = 7), and shallow anterior chamber (n = 3). Regression analysis indicated that older age (odds ratio

[OR] = 1.09; P = 0.043) was positively associated with complete success, while a mixed angle closure mechanism (OR = 0.17; P = 0.036) reduced success rate.

Conclusion

The combination of SPI, GSL, and GT is a safe and effective surgical approach for advanced PACG without cataract. It has great potential as a first-line treatment option for these patients.

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CENTRAL CORNEAL THICKNESS AMONG FILIPINO PATIENTS IN AN AMBULATORY EYE SURGERY CENTER USING ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY

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Introduction

The purpose of the study was to determine the central corneal thickness (CCT) among Filipino patients that may contribute to different glaucoma diagnosis using the anterior segment optical coherence tomography in an ambulatory eye surgery centre.

Methods

A single-centre retrospective, cross-sectional study design including 1,232 eyes of 641 patients of the Asian Eye Institute, Makati, Philippines from January 2019 to December 2019 who had their CCT measured with Visante anterior segment optical coherence tomography (AS-OCT). CCT was correlated with age, sex, presence of diabetes and/or hypertension, and glaucoma diagnosis.

Results

Among 641 patients who had their CCT measured by Visante AS-OCT, 723 eyes of 369 patients were included. Nearly half of the study population were normal or glaucoma suspects. The mean CCT among Filipino patients was 535.59 ± 34.06 µm. Ocular hypertensive patients had the thickest CCT, while normal tension glaucoma patients had the thinnest CCT. After adjusting for multiple variables, CCT had a direct relationship with the presence of diabetes, IOP level and the diagnosis of ocular hypertension, while inverse relationship with age. Most of the patients presenting with angle closure glaucoma were females aged 60 and above.

Conclusion

Visante AS-OCT is a non-contact and non-aerosol generating instrument allaying the fear of disease transmission from contact or aerosolization of tears. Our study confirms similar relationships of CCT with age, presence of diabetes, IOP level, and diagnosis of ocular hypertension or normal-tension glaucoma among Filipino patients with the available literature from other ethnicities.

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LATE-ONSET SUBCONJUNCTIVAL ABSCESS SECONDARY TO SERRATIA MARCESCENS ASSOCIATED WITH UNEXPOSED AHMED GLAUCOMA VALVE IMPLANT

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Introduction

The purpose of this study was to report a rare case of late-onset subconjunctival abscess associated with an unexposed Ahmed glaucoma valve implant secondary to Serratia marcescens, a rare conjunctival pathogen.

Methods

Case description including clinical imaging and literature review of glaucoma drainage device (GDD)-related infections.

Results

A 73-year-old man presented with blurring of vision, redness, and pain on his right eye 2 months after Ahmed glaucoma valve implantation for advanced post-penetrating keratoplasty glaucoma. The patient was nonsmoker, had fairly controlled type 2 diabetes mellitus on insulin, and had undergone multiple eye surgeries on the right eye. On ocular examination, the conjunctiva was injected with fairly delineated yellowish-white subconjunctival material in the supero-temporal quadrant with no associated tube exposure or leak, and the anterior chamber was quiet. The patient was assessed with Ahmed glaucoma valve infection with subconjunctival abscess and was treated by Ahmed glaucoma valve explant with directed systemic and topical antimicrobial therapy. The culture and sensitivity results revealed S. marcescens sensitive to ciprofloxacin, ceftazidime, gentamicin, and amikacin. Despite the virulence of the pathogen, the eye was saved.

Conclusion

Ahmed glaucoma valve infection with subconjunctival abscess secondary to S. marcescens is rare. GDD-related infections should be suspected in patients presenting with blurring of vision, pain, and redness even in the absence of tube exposure. Early diagnosis and treatment with culture-guided antimicrobial therapy combined with GDD explant is fundamental in optimising the visual outcome.

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Figures

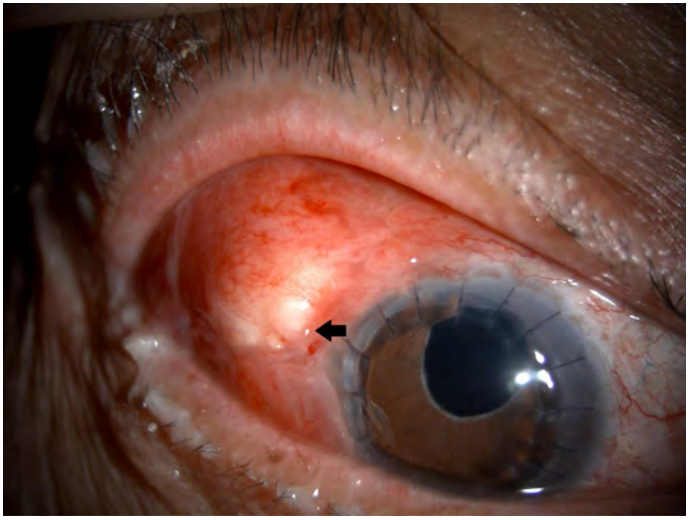

Figure 1. The slit-lamp examination showing matted eyelids, conjunctival injection with fairly delineated yellowish-white subconjunctival material (black arrow) in the superotemporal quadrant, no tube exposure, clear corneal graft, no anterior chamber reaction, and intraocular lens in place.

SHORT-TERM OUTCOMES OF TRANS-SCLERAL SUTURE FIXATION OF POSTERIOR CHAMBER INTRAOCULAR LENS IMPLANT COMBINED WITH PARS PLANA AHMED GLAUCOMA VALVE IMPLANTATION

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Introduction

This study demonstrates the outcome and safety profile of scleral fixated posterior chamber intraocular lens (PC-IOL) implants combined with pars plana Ahmed Glaucoma Valve (AGV) implantation in glaucoma patients undergoing combined cataract surgery with insufficient capsular support.

Methods

A retrospective case series of 5 glaucoma patients who underwent scleral fixated PC-IOL implants combined with pars plana AGV implantation between February and November 2022 at Kurashiki Medical Centre (Okayama, Japan) were included in the study. Four patients had a diagnosis of primary open-angle glaucoma and one of exfoliative glaucoma. The mean visual field defect for all 5 patients was -23.7 ± -4.2 dB. Four patients had a combined cataract extraction with insufficient capsular support, and 1 patient had prior aphakia. The main outcome measures were reduction of intraocular pressure (IOP), improvement of best corrected visual acuity (BCVA), and the glaucoma medication score. Perioperative and postoperative complications were recorded.

Results

The mean age was 84.0+/-2.8 years, and the mean postoperative follow-up period was 6.0±3.7 months. The mean BCVA improved from 0.44 ± 0.22 to 0.23 ± 0.21 (LogMAR), there was an IOP reduction from 22.8 ± 10.4 mmHg to 12.1 ± 3.8 mmHg, and the number of medications reduced from 3.4 ± 1.1 to 2.0 ± 1.0 at 6 months postoperative. There were no perioperative or postoperative complications.

Conclusion

Trans-scleral fixation of posterior chamber IOL implant is safe in glaucoma patients undergoing cataract surgery with insufficient capsular support, which can be effectively combined with a pars plana AGV implantation.

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COMPARISON OF INTRAOCULAR PRESSURE MEASUREMENTS IN PATIENTS WITH DERMATOCHALASIS

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Introduction

To compare intraocular pressure (IOP) measurement before and after tapping eye lid in patients with dermatochalasis using non-contact air-puff, Icare rebound tonometer, Corvis ST tonometer, and the Goldmann applanation tonometry (GAT).

Methods

IOP in 184 eyes of 92 patients with dermatochalasis was obtained by 4 different tonometers in respective order. Then, all eyelid was taped before measured again with all same devices.

Results

Mean IOP measurements were statistically lower with GAT after lid tapping in patients with dermatochalsis comparing with other devices. In subgroup analysis, IOP readings by GAT with tapping eyelid tapping in patients with grade1 dermatochalasis were significantly comparable with Icare after eyelid tapping. However, in grade 2-4 dermatochlasis patients, no methods had acceptable agreement with GAT after lid tapping.

Conclusion

In patient with mild dermatochalasis, IOP readings by GAT after lid tapping were statistically similar to those obtained using Icare after lid tapping. However, in patient with significant dermatochalasis group, poor agreement was shown between all devices. NCT, Icare and Corvis obviously overestimate IOP in this group.

There was no single device measuring comparable IOP with GAT with lid tapping in patients with significant dermatochalasis.

EFFECT OF TRANSSCLERAL CYCLOPHOTOCOAGULATION ON OCULAR HYPOTONY POST TRABECULECTOMY

Pek Hwi T, Neshalene Ratna K, Nasuha I, Wan Haslina W, Roslinah M

Objectives

1. To compare the incidence of ocular hypotony post augmented trabeculectomy with and without prior transscleral cyclophotocoagulation (TSCPC).
2. To determine the time of onset of ocular hypotony and to compare the mean intraocular pressure (IOP) reduction between the 2 groups.

Methodology

A retrospective study was performed in the Department of Ophthalmology, Hospital Kuala Lumpur. All adult subjects with primary glaucoma who underwent augmented trabeculectomy from January 2014 to December 2018 were recruited. Subjects were assigned into group T (without prior TSCPC) and group TL (with prior TSCPC). Pre- and postoperative mean IOP at week 2, 4, 12, 24, 52, and 104 were collected.

Results

A total of 43 out of 78 subjects (55.1%) were included. There were 28 and 15 subjects in group T and TL respectively. The overall incidence of ocular hypotony was 25.6% (11/43). The incidence of ocular hypotony was higher in group T (39.3%) compared to group TL (6.7%) ($p > 0.05$). There were 6 (21.4%), 3 (10.7%), 1 (3.6%) and 1 (3.6%) subjects with ocular hypotony at week 2, 4, 24, and 104, respectively, in group T, while only 1 (6.7%) subject had ocular hypotony at week 2 in Group TL. Preoperative IOP was 23.4 mmHg (group T) and 30.4 mmHg (group TL). Mean IOP reduction was 8.2 mmHg (group T) and 12.3 mmHg (group TL) at week 104 ($p > 0.05$).

Conclusion

Incidence of ocular hypotony was higher among post-augmented trabeculectomy without prior TSCPC. Ocular hypotony was commonest at week 2 post-trabeculectomy in both groups. Both groups showed effective long-term IOP reduction.

COMBINED TRANS-CANNULA ANGLE WASHOUT WITH PHACOEMULSIFICATION IN PSEUDOEXFOLIATION GLAUCOMA PATIENTS WITH CATARACT: AN ALTERNATIVE APPROACH

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Introduction

Pseudoexfoliation syndrome is associated with elevation of intraocular pressure is due to chronic accumulation of an abnormal insoluble fibrillary matrix trabecular meshwork (TM). Goniowash combines cataract surgery with a simple and additional washout procedure of the TM, eliminating the exfoliative material located on the TM in order to restore the physiological pathway of aqueous humour and reduce intraocular pressure (IOP) in pseudoexfoliative glaucoma (PXG) patients.

Methods

This is a retrospective analysis of 13 patients who underwent trans-cannula angle washout combined with phacoemulsification between 2020 and 2022 at Hospital Raja Permaisuri Bainun, Malaysia. Data including best-corrected visual acuity, IOP, and medication status were collected preoperatively and postoperatively on day 1, month 1, week 6, month 3, month 6, and month 12.

Results

Data from 13 eyes were assessed. Mean best-corrected visual acuity increased from 1.05 to 0.26 ($p = 0.004$) 1 year after surgery and remained stable throughout the follow-up. Average IOP decreased from 18.46 ± 4.50 mmHg preoperatively to 14.46 ± 2.88mmHg postoperatively at 1 year ($p = 0.018$). Mean number of ocular hypotensive medications decreased from 3.08 ± 0.76 preoperatively to 2.23 ± 1.10 postoperatively (28% reduction) ($p = 0.020$). No unexpected or severe adverse events related to the surgical procedure were reported.

Conclusion

Goniowash using transcannula combined with cataract surgery provides stable and long-lasting ocular hypotensive effects. It is a safe procedure and may be an alternative for patients with pseudoexfoliation syndrome and elevated intraocular pressure.

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Tables

Outcome measure	1 day	1 week	1 month	6 week	2 months	3 months	6 mon hs
IOP(mmHg)							
Pre op	18.46± 4.50	18.46± 4.50	18.46± 4.50	18.46± 4.50	18.46± 4.50	18.46± 4.50	18.46± 4.50
Post op	15.46± 3.53	13.62± 1.50	15.77± 4.68	14.46±2 .67	15.62± 4.82	14.00± 2.35	12.38± .57
P value	0.065	0.003	0.008	0.177	0.155	0.007	0.001
Visual acuity (logMAR)							
Pre op	1.05 ± 0.83	1.05 ± 0.83	1.05 ± 0.83	1.05 ± 0 .83	1.05 ± 0.83	1.05 ± 0.83	1.05 ± .83
Post op	0.89 ± 0.68	0.72 ± 0.70	0.31 ± 0.13	0.26 ± 0 .11	0.26 ± 0.11	0.27 ± 0.18	0.26 ± .16
P value	0.194	0.136	0.007	0.004	0.004	0.000	0.004
Glaucoma medication							
Pre op	3.08 ± 0.76	3.08 ± 0.76	3.08 ± 0.76	3.08 ± 0 .76	3.08 ± 0.76	3.08 ± 0.76	3.08 ± .76
Post op	3.08 ± 0.76	3.00 ± 0.91	2.77 ± 1.24	2.85± 1. 14	2.92 ± 0.95	2.77 ± 1.17	2.31 ± .03
P value	0	0.337	0.104	0.190	0.337	0.264	0.026

OUTCOMES OF SHORT-PULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION TREATMENT IN GLAUCOMA

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Introduction

Short-pulse TSCPC (SP-TSCPC) differs from traditional TSCPC as it delivers repetitive short pulses of energy alternating with resting periods, which cause less collateral damage. Prior data using different laser machine has documented safe and effective reduction in intraocular pressure (IOP). This study was conducted to evaluate the outcome of short-pulse TSCPC by Merilas 810 laser machine in various type of glaucoma including patient with good vision.

Methods

A retrospective analysis of seven patients l patients who received SP-TSCPC treatment from January 2023 to July 2023 at Hospital Raja Permaisuri Bainun, Malaysia. Data was collected during the second week, sixth week, third month and sixth month follow-up. The primary outcome measure gave success rate at six months post-treatment. Secondary measures were changes in visual acuity, mean IOP reduction, mean number of IOP lowering medications reduced and ocular side effects noted during follow-up.

Results

The success rate was 71% (5 eyes out of 7 eyes) at 6 months post-treatment. The mean IOP reduced from 32.57 mmHg ± 3.2mmHg pre-treatment to 24.57 mmHg ± 10.0 mmHg at 2 weeks post treatment with 24.8% reduction. Subsequently, mean IOP at sixth week, third month and sixth month was 22.86 mmHg ± 5.15 mmHg, 24.86 mmHg ± 11.4 mmHg, and 25.0 mmHg ± 8.1 mmHg, respectively. Mean IOP reduction at 6 months was 7.57 mmHg ± 7.8 mmHg. Vision was maintained in all patients. No serious ocular side effects were noted.

Conclusion

SP-TSCPC provides a significant short-term IOP reduction and favourable safety profile in eyes with refractory glaucoma.

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Tables

Table

Outcome measure	Baseline	6 months	p value
IOP(mmHg)			
Mean	32.57±3.21	25±8.10	0.042*
Range	28-36	18-40	
BCVA(logmar)			
Mean	0.82±0.89	0.75±0.79	0.239*
Range	0-2.3	0-1.9	
Medication			
Median	4	4	

Mean	4	4.29	0.172*
Range	0-4	0-5	

BCVA=best-corrected visual acuity; IOP=intraocular pressure;logMAR=logarithm of the minimum angle of resolution.

RETROBULBAR HAEMORRHAGE IN POST-GLAUCOMA DRAINAGE DEVICE IMPLANTATION

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Introduction

Retrobulbar haemorrhage is an uncommon complication of glaucoma drainage device (GDD) and is rarely reported. Orbital haemorrhage can occur spontaneously, in patients with blood diseases, after trauma, and following cataract, strabismus, endoscopic sinus surgery, and blepharoplasty. Herein, we report a case of retrobulbar haemorrhage in a patient post GDD.

Methods

Case report.

Results

A 61-year-old gentleman, no underlying medical illness, with both eyes secondary angle closure glaucoma post non-penetrating glaucoma surgery 13 years ago and ultrasound cycloplasty 2 years ago, who underwent GDD in the left eye under general anaesthesia. Preoperative examination revealed visual acuity of 6/12, intraocular pressure (IOP) 20 mmHg on 5 antiglaucoma drops, pseudophakia, pale disc with cup-disc-ratio of 0.9 and tunnel visual field. However, hyperaemic conjunctiva with dense fibrosis 12 to 1:30 o'clock and dilated vessels was observed. PGI was implanted supero-temporally uneventfully and bleeders were secured prior to wound closure. Postoperative 4 hours review showed vision of 6/60 pinhole 6/24, IOP 22 mmHg and subconjunctival haemorrhage. Postoperative day 1 noted dropped vision, proptosis and ophthalmoplegia. Examination showed vision hand movement and tense globe with extensive subconjunctival haemorrhage, which was suggestive of retrobulbar haemorrhage. Prompt canthotomy with cantholysis was performed. Computed tomography scan

demonstrated a hyperattenuating layer encircled globe posteriorly, abutting the distal end of optic nerve. Patient refused examination under anaesthesia and opted for systemic corticosteroid with antiglaucoma medications. Conjunctival suture was opened up to prevent further accumulation of subconjunctival haemorrhage. He was treated with 3 days of intravenous methylprednisolone and oral steroid in tapering dose over 2 months. His vision, proptosis, and intraocular pressure improved gradually. Postoperative 2 months, proptosis resolved and his vision improved to 6/18 PH 6/12 and IOP of 16 mmHg without any antiglaucoma medication.

Conclusion

Retrobulbar haemorrhage is a rare yet sight-threatening diagnosis. Prompt diagnosis and treatment can improve visual outcome.

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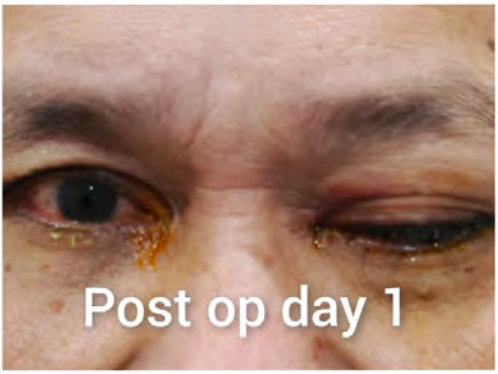
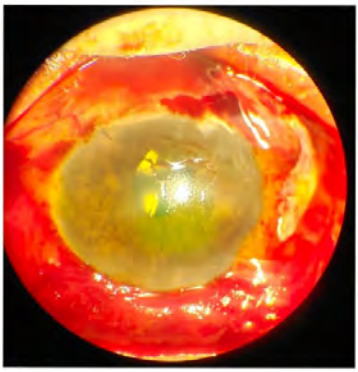
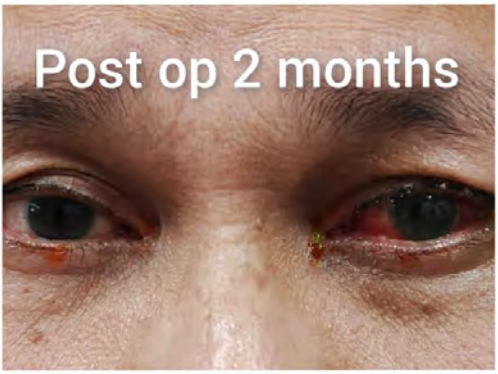
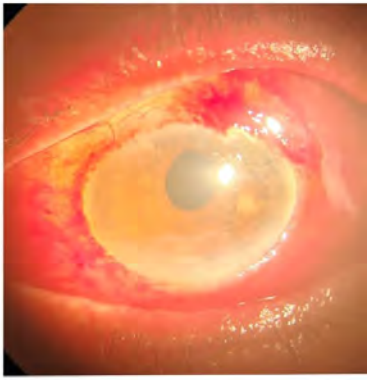
Tables, Figures, and Illustrations









PENLIGHT OBLIQUE EXAMINATION AS A SCREENING TOOL IN THE DETERMINATION OF NARROW ANGLES AMONG PATIENTS OF ILOCOS TRAINING AND REGIONAL MEDICAL CENTER

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Introduction

The penlight oblique examination is a simple method that detect eyes with occludable angles by assessing the anterior chamber depth (ACD), which is the most important anatomical risk factor for angle closure.[1,2] Despite the penlight oblique examination's low sensitivity in some studies,[3] it can still be valuable in the community, especially in areas that receive less medical attention since it can be performed by a non-ophthalmologist without any special equipment.

Methods

This is a single-centre, cross-sectional study of patients who went for general consult at the ITRMC Eye Centre from August 2023 onwards. Participants underwent penlight oblique examination by a trained non-ophthalmologist and an ophthalmology resident. Eyes were classified as "shallow" or "deep" ACD based on illumination or shadowing of the iris (Figure 1). Gonioscopy was performed by a glaucoma specialist to confirm the presence of angle closure.

Results

A total of 356 eyes from 178 patients were included. Majority were female (71.35%), and 31.46% belonged to the 60–69 age group. Comparison of the results by the two examiners showed a kappa statistic of 0.6597 ($p < 0.000$), indicating good agreement. The sensitivity of the penlight exam conducted by the non-ophthalmologist was significantly higher (94.31%, $p < 0.000$), and significantly lower specificity (76.97%, $p < 0.000$) compared to the ophthalmology resident (78.05%, 86.27%, respectively) with gonioscopy as the gold standard. Six eyes confirmed to

have angle closure by gonioscopy were correctly identified to have shallow ACD by penlight exam by both non-ophthalmologist and ophthalmology resident.

Conclusion

Penlight oblique examination is a valid screening tool in detecting angle closure and can be performed by a trained non-ophthalmologist staff in a community setting where slit-lamp examination and gonioscopy cannot be done. By doing so, immediate referrals to health care institutions can be made hence preventing the debilitating effect of primary angle closure.

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Tables, Figures, and Illustrations

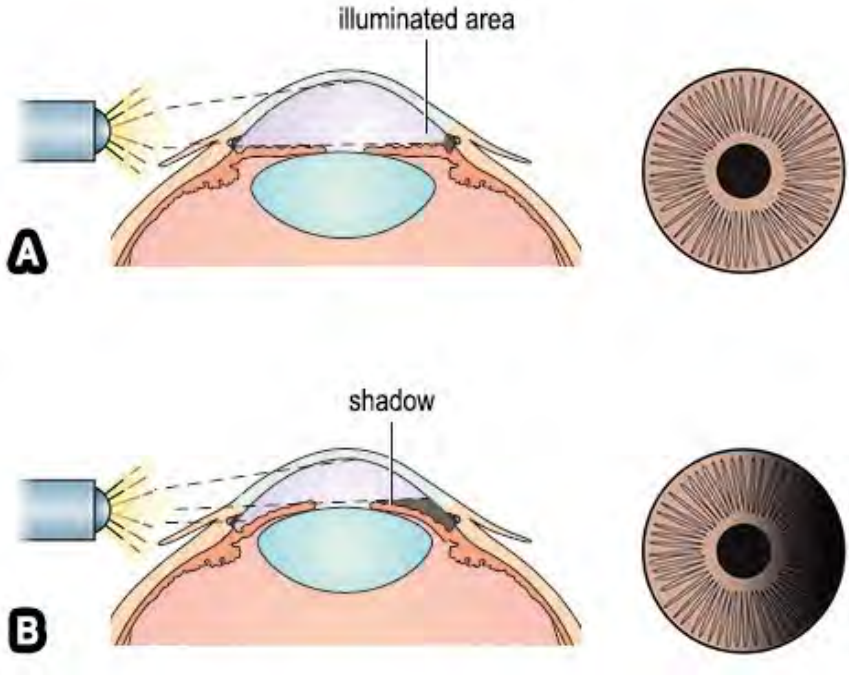

Figure 1. Graphic representation of penlight oblique examination. (Photo modified from BrainKart.com)[4]

A SEQUENTIAL DIAGNOSIS APPROACH FOR BILATERAL PROGRESSIVE IRIS ATROPHY VARIANT OF IRIDOCORNEAL ENDOTHELIAL SYNDROME: A CASE REPORT

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Introduction

Iridocorneal endothelial (ICE) syndrome is described as a progressive, sporadic, and primarily unilateral group of disorder that could manifest variable degrees of corneal oedema, iris atrophy, and secondary glaucoma. One of its variants, progressive iris atrophy (PIA), is generally uncommon and has been stipulated to cause refractory secondary glaucoma due to membrane formation at the anterior chamber angles and progressive synechial closure. Herein, we report and propose a stepwise approach into the diagnosis of progressive iris atrophy to prevent progression of glaucoma complications secondary to ICE syndrome.

Methods

Case report.

Results

A 21-year-old male presented with complaints of bilateral visual impairments. Intraocular pressure (IOP) was normal in both eyes, and on an IOP-lowering medication from a previous eye clinic visit. Slit lamp and gonioscopy revealed ectropion uvea, corectopia, polycoria, iris hyperpigmentation, and multiple peripheral anterior synechiae. Anterior segment optical coherence tomography (AS-OCT) suggested the presence of corneal oedema, and extensive anterior synechiae alongside iris epithelium deposits in the corneal endothelium, resulting in a chronic angle-closure glaucoma. Pleomorphic corneal endothelial cells and decreased

corneal density were observed bilaterally from specular microscopy, confirming the diagnosis of ICE syndrome. Patient showed satisfactory results using an IOP-lowering agent. Over the 12-month follow-up period, no further deterioration to the anterior segment structures was observed. However, the last 2 months of follow-up revealed a unilateral IOP elevation, thus a second IOP-lowering eye drop was administered and successfully returned the IOP back to normal.

Conclusion

To date, no guideline concerning the diagnosis of ICE syndrome and its variants has ever been published. Our case shows that an early and well-structured diagnostic approach are necessary to establish diagnosis and prevent glaucomatous complications in ICE syndrome.

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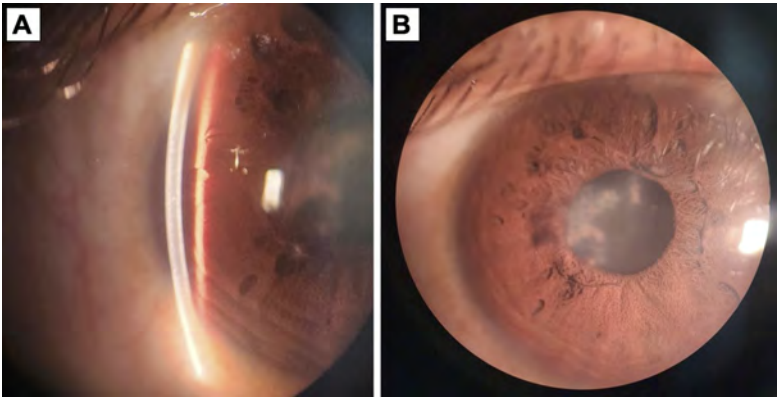

Figure 1. At presentation. Right eye slit lamp photograph demonstrating iris pigments in the corneal endothelium and cloudy stroma (A) and ectropion uvea (B).

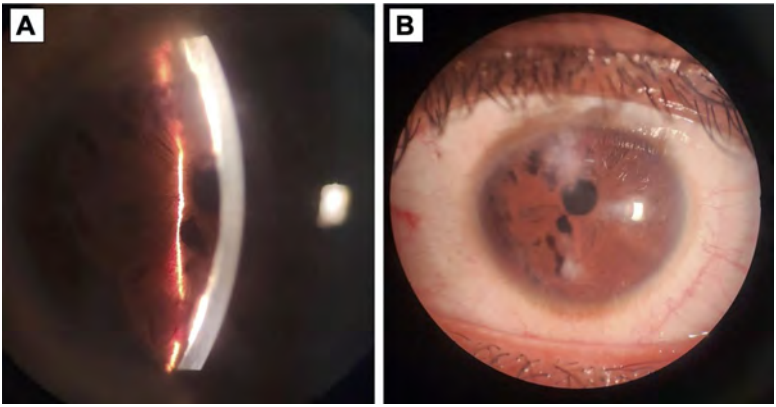

Figure 2. At presentation. Left eye slit lamp photograph demonstrating iris pigments in the corneal endothelium and cloudy stroma (A), corectopia, and polycoria (B).

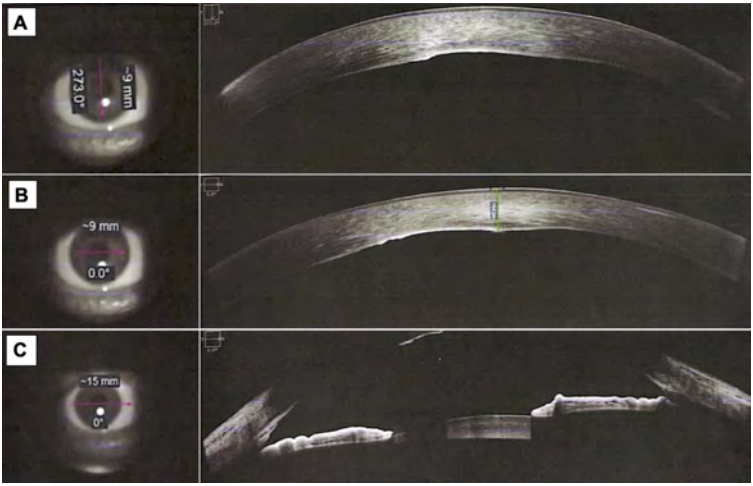

Figure 3. At presentation. AS-OCT of the right eye showed corneal oedema and open iridocorneal angles.

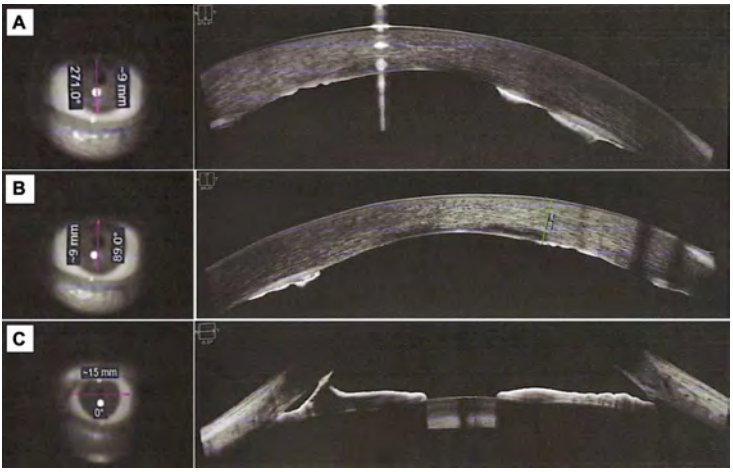

Figure 4. At presentation. AS-OCT of the left eye revealed corneal oedema, PAS, and closed iridocorneal angle.

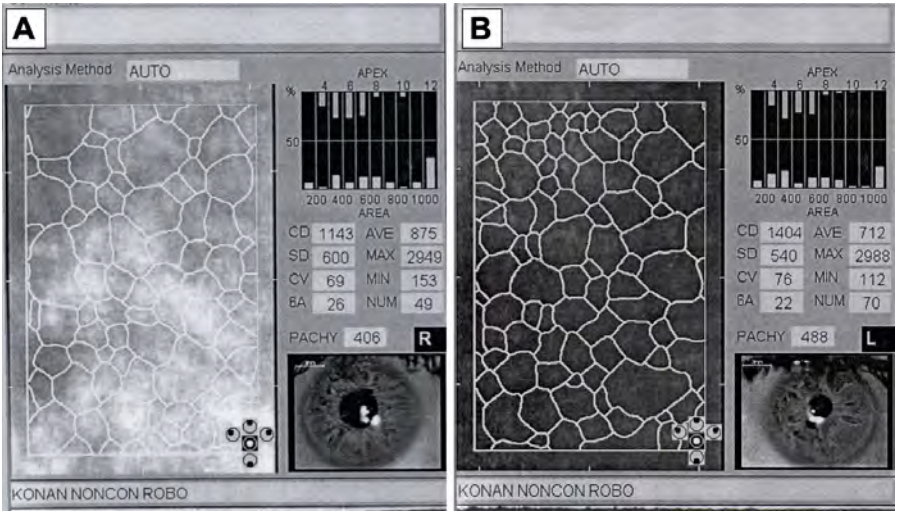

Figure 5. Specular microscopy of the right eye (A) and the left eye (B), showing pleomorphic endothelial cells and low-density corneas.

TRANSLATION AND VALIDATION OF THE TAGALOG TRUST IN OPHTHALMOLOGIST SCALE

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Introduction

Patients who trust their physicians tend to be more satisfied and likely to adhere to the recommended treatment plan.[1] Since severe or chronic visual impairment significantly affects the quality of life of patients, trust is important between patients and their ophthalmologists in order to provide a better level of care. Prior to this study, no population-specific measure in Tagalog language has been validated to determine the level of trust of patients in their ophthalmologist. Therefore, this study adapted and translated the Trust in Oncologist Scale (TiOS) by Hillen[2] into the Tagalog Trust in Ophthalmologist Scale (TTOS) and validated the latter.

Methods

The 18-item TiOS questionnaire was translated into Tagalog and validated in a cohort of 200 Filipino ophthalmology patients of a single institution. Internal consistency, construct validity, and test-retest reliabilities were determined. Exploratory factor analyses were also performed.

Results

The TTOS showed high internal consistency with Cronbach alpha of 0.92, high reliability with Pearson's coefficient of 0.85, and high validity with Spearman’s coefficient of 0.67.

Conclusion

The TTOS is a valid and reliable tool to measure the level of trust of Filipino patients in their ophthalmologists.

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CHANGES IN INTRAOCULAR PRESSURE IN LATERAL DECUBITUS POSITION IN PATIENTS WITH ASYMMETRICAL NORMAL-TENSION GLAUCOMA AND OBSTRUCTIVE SLEEP APNOEA

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Purpose

To assess the intraocular pressure (IOP) at various body positions and its correlation with preferred sleeping posture, clinical and ocular parameters in individuals diagnosed with normal tension glaucoma and obstructive sleep apnoea (NTG-OSA).

Methods

IOP measurements were taken in both eyes of 30 NTG-OSA subjects (18 with unilateral and 12 with asymmetrical glaucoma) and 20 healthy controls, using a Tonopen (Reichert Inc., Depew, USA). Measurements were obtained in sitting, supine, and lateral decubitus positions (LDP). Each maintained for 5 minutes before IOP measurement. Additionally, height, weight, blood pressure, biometric measurements, and visual field tests were conducted.

Results

Compared to healthy controls, the NTG-OSA group comprised older individuals, more males, higher body mass index, longer axial length, and higher mean ocular perfusion pressure in the supine position (all $P < 0.05$). In the NTG-OSA subjects, the more severe eyes were predominantly right eyes and exhibited thinner central corneal thickness compared to the fellow eye. Among the NTG-OSA subjects, 26 slept predominantly on one side during LDP, with 12 placing their worse eye in the dependent (lower positioned) LDP and 10 in the independent position during sleep ($P = 0.904$). IOPs in the supine, dependent and independent LDP were higher than those in the sitting for both the study eye and fellow eyes (all $P < 0.002$). The visual field index and mean deviation in both the study eye and fellow eye showed a

negative association with changes in IOP from the LDP (either dependent or independent) to supine in the respective eye (all $P < 0.05$).

Conclusions

Higher IOP levels in the dependent or independent LDP compared to the supine position may lead to poorer visual field outcomes in individuals with NTG-OSA. Alterations in IOPs at different postures during sleep might potentially contribute to the development and progression of glaucoma in individuals with OSA.

TRAUMATIC HYPHAEMA IN A 12-YEAR-OLD WITH HEMOPHILIA A: A CASE REPORT

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Introduction

Haemophilia A is an inherited bleeding disorder characterized by a deficiency in coagulation factor VIII (FVIII), and it follows an X-linked recessive inheritance pattern. Common clinical manifestations of the disease include bleeding into joints, muscles, and soft tissues, as well as occurrences of retroperitoneal or intracerebral haemorrhages, and prolonged bleeding following minor trauma or surgical procedures. It is uncommon for individuals with haemophilia to experience spontaneous or traumatic hyphaema.

Methods

This case report describes the unique presentation and management challenges of a 12-year-old male patient who initially presented with blunt trauma to his left eye resulting in total hyphaema and elevated intraocular pressure. The subsequent discovery of undiagnosed haemophilia A significantly complicated the treatment course. Surgical intervention in the form of an anterior chamber (AC) wash was indicated. However, during the pre-operative clearance process, laboratory investigations revealed a diagnosis of haemophilia A, which had previously gone undetected. Factor VIII, essential for haemostasis, was required for safe surgical intervention.

Results

Due to the limited availability of Factor VIII, the surgical management of the hyphema was deferred. Surprisingly, as the medical team awaited the procurement of the required clotting factor, the hyphema resolved spontaneously. However, blood trickled down to the posterior chamber, leading to a vitreous haemorrhage.

Despite the absence of any surgical intervention, the vitreous haemorrhage also resolved over the course of a few months, without any apparent complications.

Conclusion

This case emphasises the challenges of managing hyphaema in patients with undiagnosed bleeding disorders, such as haemophilia A. It underscores the need for careful consideration of the timing and necessity of surgical intervention in such cases. Further research is warranted to explore the long-term visual outcomes and complications associated with delayed management in similar cases.

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CLINICAL CHARACTERISTICS AND RATES OF BLINDNESS OF ACUTE ANGLE CLOSURE: RESULTS OF MULTICENTRE, REAL-WORLD RETROSPECTIVE ANALYSIS

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Introduction

To investigate the relationship between demographics and clinical characteristics of acute angle closure (AAC) patients and the rates of blindness and to provide real-world epidemiological reference for preventing and treating blindness in Chinese AAC patients.

Methods

A retrospective analysis was conducted in a multicentre, real-world database, encompassing data from 23 hospitals across 17 provincial-level regions in China between September 7, 2020 and January 6, 2022. A total of 2626 consecutive patients (2874 eyes) with AAC were recruited. The rates of blindness before and after treatment were analysed. Age, sex, time from symptom onset to treatment (TST), and eye manifestations were compared.

Results

Among patients with AAC, 75.97% were female, resulting in a sex ratio (female/male) of 3.16, and the average age of patients was 66.7 ± 9.3 years. The proportion of AAC patients with TST less than 3 days was only 34.1%. Following initial treatment, there was a significant reduction in intraocular pressure from 35.59 ± 17.91 mmHg to 15.51 ± 5.77mmHg, accompanied by a decrease in the rates of uncorrected distance visual acuity-based blindness from 42.0% to 19.7%, as well as a decline in corrected distance visual acuity-based blindness from 27.7% to 16.3%.

Conclusion

The current rates of blindness in AAC patients remains significantly high, with only one-third of AAC patients seeking medical intervention within three days following the acute attack. Enhancing education and screening efforts targeting high-risk individuals with AAC continues to be pivotal in mitigating future rates of AAC-related blindness.

Figures

Figure 1. Age and sex distribution of patients with acute angle closure.

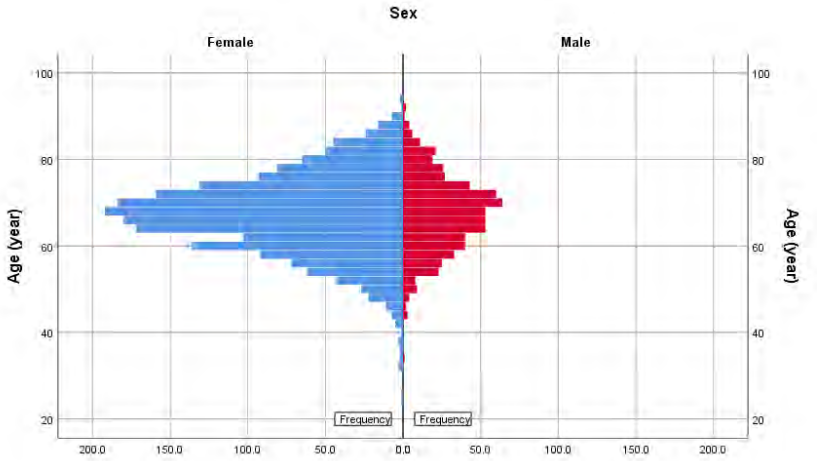
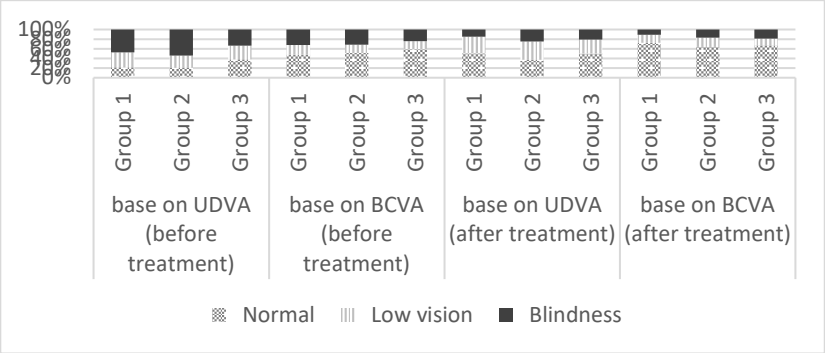


Figure 2. Changes in the rate of visual impairment before and after treatment among patients with acute angle closure, considering varying time from symptom onset to treatment.



Group 1 = the time from symptom onset to treatment ≤ 3 days; Group 2 = 3 < the time from symptom onset to treatment ≤ 7 days; Group 3 = the time from symptom onset to treatment > 7 days.

ACUTE ATTACK HISTORY AS A PROGNOSTIC FACTOR IN PHACOEMULSIFICATION FOR PRIMARY ANGLE-CLOSURE GLAUCOMA

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Introduction

Primary angle-closure disease is a chronic optic neuropathy linked with optic nerve damage and stands as the major cause of irreversible blindness globally. Phacoemulsification is a viable option influenced by lens-induced changes, nonetheless, significant variability in postoperative outcomes persists. Our retrospective study explores the impact of acute angle-closure attacks, aiming to reveal the prognostic significance of its history in primary angle closure (PAC) or primary angle-closure glaucoma (PACG) patients undergoing phacoemulsification, determining their association with postoperative outcomes.

Methods

The study included 153 eyes diagnosed with PAC or PACG undergoing phacoemulsification at Cipto Mangunkusumo Hospital from January 2019 to December 2020. Patients were grouped based on the history of acute angle-closure attacks. The variables compared were intraocular pressure (IOP), uncorrected visual acuity (UCVA), number of medications, and cup-to-disc ratio (CDR) pre- and post-phacoemulsification.

Results

Among the eyes, 39 had a history of acute attacks, while 114 did not. The mean follow-up was 3.58 (± 2.15, IQR: 1.5-6) months. Follow-up measurements were conducted for all eyes after 1 month, 114 eyes (74%) after 3 months, 56 eyes (36%) after 6 months, and 29 eyes (25%) after more than 6 months. There was a significant difference in UCVA between groups ($p<0.05$). Eyes with a history of acute attacks had

a consistently lower UCVA in both pre- and phacoemulsification compared to eyes without ($p < 0.05$). Both groups showed an overall significant decline in UCVA. ($p < 0.05$). IOP progression, medication, and CDR did not differ between groups ($p > 0.05$) but showed an overall decline post-phacoemulsification ($p < 0.05$).

Conclusion

Despite the overall decline in IOP, UCVA, medications, and CDR post-phacoemulsification, patients with a history of acute attacks in PAC and PACG are associated with a poorer visual acuity prognosis compared to those without such history.

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Tables, Figures, and Illustrations

Figure 1. Effect of acute angle-closure attack history on UCVA progression pre- and post-phacoemulsification

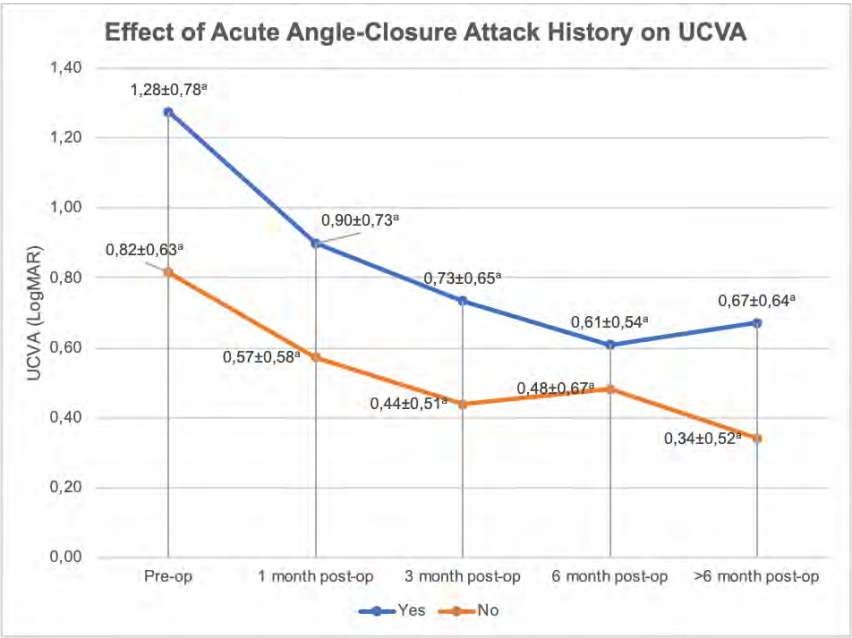

Figure 2. Effect of acute angle-closure attack history on IOP progression pre- and post-phacoemulsification.

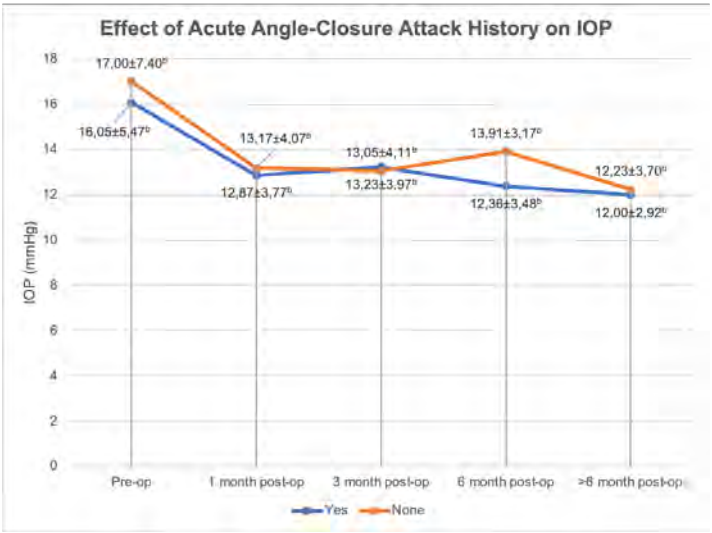

Figure 3. Effect of acute angle-closure attack history on the number of glaucoma medication pre- and post-phacoemulsification.

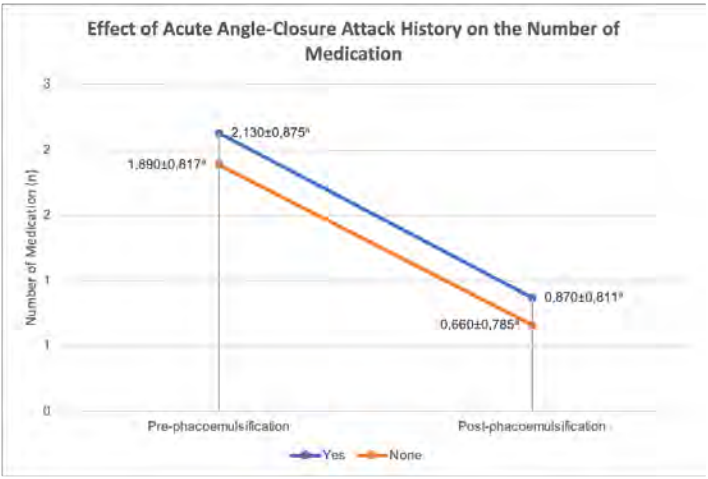

Figure 4. CDR progression based on acute angle-closure attack history.

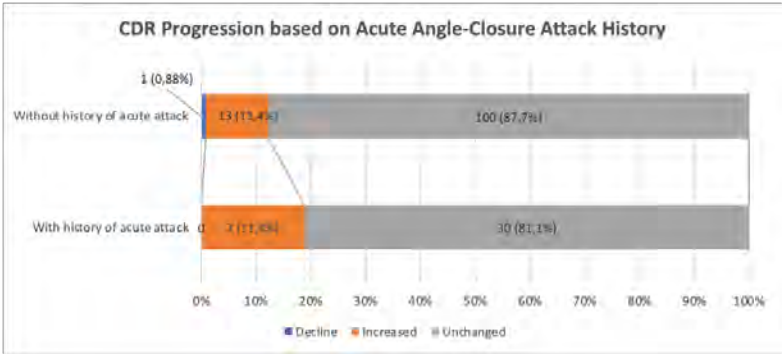

Table 1. Comparison of mean UCVA between groups pre- and post-phacoemulsification

Component	Previous history of acute angle-closure attack	N	Mean	Std. Deviation	p
UCVA Pre-op	Yes	38	1,305	0,776	0,000[a]
	None	114	0,822	0,632	
UCVA 1 month post-op	Yes	38	0,844	0,727	0,019[a]
	None	114	0,575	0,576	
UCVA 3 months post-op	Yes	26	0,735	0,653	0,014[a]
	None	87	0,441	0,506	
UCVA 6 months post-op	Yes	11	0,609	0,538	0,066[b]
	None	44	0,489	0,665	
UCVA >6 months post-op	Yes	7	0,671	0,640	0,017[a]
	None	21	0,352	0,516	

[a]Significant differences, as indicated with $p < 0.05$

[b]No significant differences, as indicated with $p > 0.05$

Table 2. Comparison of mean IOP between groups pre- and post-phacoemulsification

Component	Previous history of acute angle-closure attack	N	Mean	Std. Deviation	p
IOP Pre-op	Yes	38	16,053	7,403	0,225[b]
	None	114	17,005	5,469	
IOP 1 month post-op	Yes	38	12,870	4,068	0,547[b]
	None	114	13,200	3,773	
IOP 3 months post-op	Yes	26	13,230	4,112	0,845[b]
	None	87	13,060	3,969	
IOP 6 months post-op	Yes	11	12,360	3,171	0,162[b]
	None	44	14,000	3,478	
IOP >6 months post-op	Yes	7	12,000	3,697	0,808[b]
	None	21	12,330	2,921	

[b]No significant differences, as indicated by $p > 0.05$

Table 3. Comparison of number of medication between groups pre- and post-phacoemulsification

Component	Previous history of acute angle-closure attack	N	Mean	Std. Deviation	p
Pre-op	Yes	38	2,130	0,875	0,106[b]
	None	114	1,890	0,817	
Post-op	Yes	38	0,870	0,811	0,129[b]
	None	114	0,660	0,785	

[b]No significant differences, as indicated by $p > 0.05$

Table 4. Comparison of CDR between groups pre- and post- phacoemulsification

Component	Previous history of acute angle-closure attack	N	Mean	Std. Deviation	p
Pre-op	Yes	37	0,676	0,230	0,559[b]
	None	114	0,661	0,198	
Post-op	Yes	37	0,703	0,230	0,355[b]
	None	114	0,675	0,203	

[b]No significant differences, as indicated by $p > 0.05$

A CASE OF ANTERIOR CHAMBER AND VITREOUS HAEMORRHAGE FOLLOWING PRESERFLO MICROSHUNT SURGERY

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Introduction

Preserflo MicroShunt surgery (PFM) is a procedure that does not require iris excision or removal of the angle-corneal block, and it is believed to have a low risk of anterior chamber bleeding. However, in this report, we present a case where prolonged anterior chamber bleeding and vitreous haemorrhage occurred after PFM, leading to vitrectomy.

Methods

An 86-year-old male with pseudoexfoliation glaucoma underwent uncomplicated PFM with adjunctive mitomycin C (MMC). The following day, a massive anterior chamber haemorrhage was observed, which subsequently spread to the vitreous cavity. After one month with no improvement, pars plana vitrectomy (PPV) with anterior chamber washout was performed.

Results

Postoperatively, the visual acuity significantly improved, and the shape of the bleb was maintained. Throughout the follow-up, the intraocular pressure consistently remained in the single digits. On postoperative angle examinations, the tube was inserted on the Schwalbe's line side of the pigment band. The postoperative visual field examination did not show any progression compared to the preoperative status. The preoperative examination revealed no abnormalities in platelet count or coagulation function, but the patient was taking Lotriga (LOTRIGA Granular Capsules) for hyperlipidaemia.

Conclusion

While the frequency of anterior chamber bleeding after PFM surgery is considered lower than that after trabeculectomy, cases like the one presented here, with substantial anterior chamber bleeding or subsequent vitreous haemorrhage, warrant caution. The lack of reports on PPV for eyes undergoing PFM underscores the importance of continued vigilant monitoring.

CHANGES OF FUNDUSCOPIC OPTIC DISC COLOR AND SIZE IN GROWTH PHASE

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Introduction

Individual variation of the optic disc colour and size affects the diagnostic accuracy of glaucoma. And the optic disc shape changes during growth phase. Therefore, the purpose of this study is to investigate the relationship between changes in the optic disc and axial elongation in children.

Methods

A prospective cohort study was performed in 75 right eyes of elementary school students for six years (8.5 to 14.5 years). Axial length was measured with OA-2000 (TOMEY, Japan). Colour fundus photographs was obtained with OCT machine 3D OCT-1 Maestro (Topcon, Japan). The optic disc colour was calculated by dividing the intensity of red by the sum of the intensity of red, green, and blue, and the area was calculated by modifying the number of pixels according to Bennett's formula. Wilcoxon signed rank test was used to compare the colour or area of optic disc and axial length in first and last year.

Results

Thirty-seven boys and 38 girls were analysed. Mean axial length in last year (24.82 mm) was significantly longer than that in first year (23.34 mm). Mean optic disc colour in last year (0.49) was significantly reddish than that in first year (0.46). Mean optic disc size in last year (41,946 pixels) was significantly smaller than that in first year (46,144 pixels).

Conclusion

The optic disc became smaller and red during this period.

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DEVELOPMENT AND CLINICAL DEPLOYMENT OF A SMARTPHONE-BASED VISUAL FIELD DEEP LEARNING SYSTEM FOR GLAUCOMA DETECTION

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Introduction

By 2040, ~100 million people will have glaucoma. To date, there are a lack of high-efficiency glaucoma diagnostic tools based on visual fields (VFs). Herein, we develop and evaluate the performance of 'iGlaucoma', a smartphone application-based deep learning system (DLS) in detecting glaucomatous VF changes.

Methods

A total of 1,614,808 data points of 10,784 VFs (5,542 patients) from seven centers in China were included in this study, divided over two phases. In Phase I, 1,581,060 data points from 10,135 VFs of 5105 patients were included to train (8424 VFs), validate (598 VFs) and test (3 independent test sets of 200, 406, 507 samples) the diagnostic performance of the DLS. In Phase II, using the same DLS, iGlaucoma cloud-based application further tested on 33,748 data points from 649 VFs of 437 patients from three glaucoma clinics. With reference to three experienced expert glaucomatologists, the diagnostic performance (area under curve [AUC], sensitivity, and specificity) of the DLS and 6 ophthalmologists were evaluated in detecting glaucoma.

Results

In Phase I, the DLS outperformed all six ophthalmologists in the three test sets (AUC of 0.834-0.877, with a sensitivity of 0.831-0.922 and a specificity of 0.676-0.709). In Phase II, iGlaucoma had 0.99 accuracy in recognizing different patterns in pattern deviation probability plots region, with corresponding AUC, sensitivity, and

specificity of 0.966 (0.953-0.979), 0.954 (0.930-0.977), and 0.873 (0.838-0.908), respectively.

Conclusion

The 'iGlaucoma' is a clinically effective glaucoma diagnostic tool to detect glaucoma from Humphrey VFs, although the target population will need to be carefully identified with glaucoma expertise input.

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Tables, Figures, and Illustrations

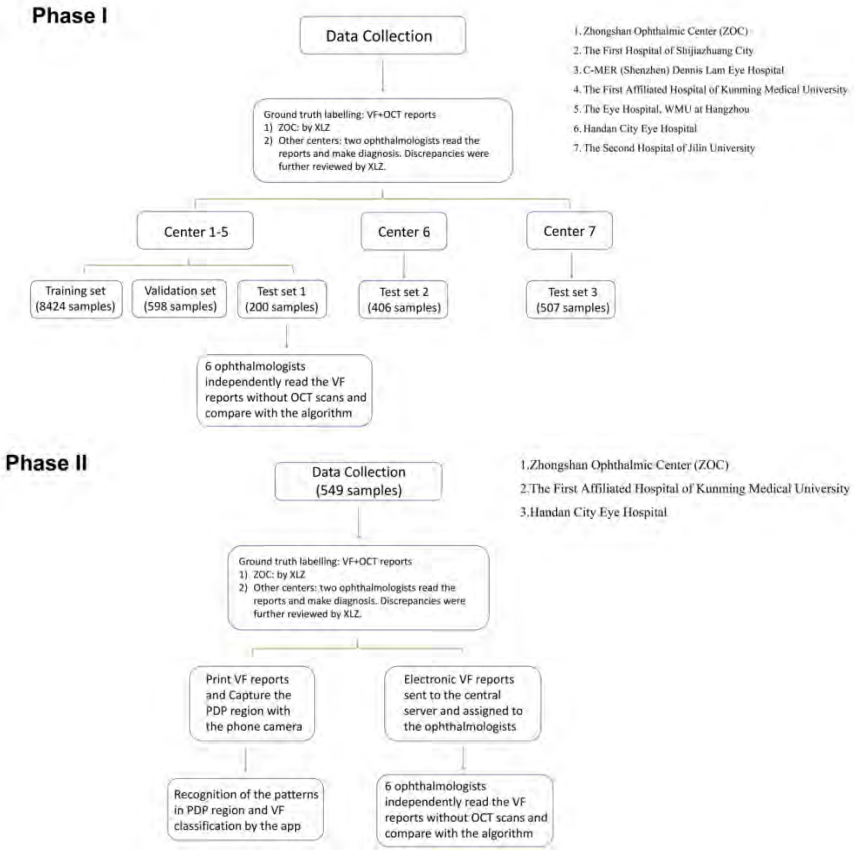

Figure 1. Flow chart of the current study. The study is composed of 2 parts. In Phase I, we developed the deep learning algorithms for classifying VFs. In Phase II, a smartphone app based on the deep learning algorithm was created and tested in the real world.

Table 1. Baseline characteristics of study participants in Phase I

Characteristics	Non-glaucoma group	Glaucoma group	*P* value[a]
Patients (eyes)	1761 (3030)	3324 (4482)	–
Images, *n* (%)	3566 (35.2)	6569 (64.8)	–
Left/Right	1834/1732	3206/3363	–
Age, mean (SD) (years)	48.4 (17.7)	55.2 (16.4)	<0.001
VFI, median (IQR) (%)	98 (5)	91 (19)	<0.001
MD, median (IQR) (dB)	−2.78 (3.96)	−5.92 (7.58)	<0.001
PSD, median (IQR) (dB)	1.89 (1.71)	3.97 (5.99)	<0.001

VFI visual field index, *MD* mean deviation, *PSD* pattern standard deviation, *SD* standard deviation, *IQR* interquartile range.
[a]Comparison of the demographic and VF parameters between non-glaucoma and glaucoma groups by Wilcoxon rank sum test.

Table 2. Performance of the CNNs and ophthalmologists in test set 1

	AUC (95%CI)	Sensitivity	Specificity	*P* value[a]
Ophthalmologists				
Attending ophthalmologist #1	0.712 (0.632–0.792)	0.741 (0.668–0.814)	0.683 (0.566–0.801)	<0.001
Attending ophthalmologist #2	0.689 (0.613–0.765)	0.525 (0.442–0.608)	0.852 (0.763–0.941)	<0.001
Attending ophthalmologist #3	0.636 (0.553–0.718)	0.583 (0.501–0.665)	0.689 (0.572–0.805)	<0.001
Glaucoma professor #1	0.656 (0.576–0.736)	0.525 (0.442–0.608)	0.787 (0.684–0.890)	<0.001
Glaucoma professor #2	0.683 (0.617–0.750)	0.580 (0.497–0.662)	0.787 (0.684–0.890)	<0.001
Glaucoma professor #3	0.717 (0.652–0.783)	0.647 (0.568–0.727)	0.787 (0.684–0.890)	<0.001
CNN				
ND + NDP + PDP	0.873 (0.822–0.924)	0.922 (0.876–0.969)	0.676 (0.567–0.785)	–
ND	0.870 (0.817–0.923)	0.915 (0.867–0.963)	0.732 (0.629–0.835)	0.81
NDP	0.857 (0.802–0.913)	0.798 (0.729–0.868)	0.817 (0.727–0.907)	0.06
PDP	0.861 (0.808–0.914)	0.868 (0.810–0.927)	0.718 (0.614–0.823)	0.06

CNN convolutional neural network, *ND* numeric displays, *NDP* numerical pattern deviation plots, *PDP* pattern deviation probability plots. *AUC*, area under curve.
[a]Comparison of AUC between the ND + NDP + PDP and the other groups using Z test.

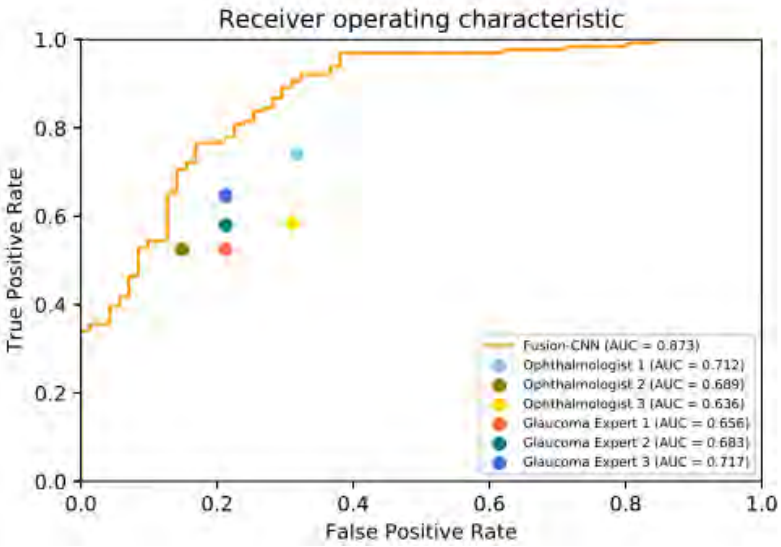

Figure 2. Comparison of diagnostic performance of the 2D-Fusion-CNN in VF interpretation with ophthalmologists in test set 1. The figure shows receiver operating curve of glaucoma diagnosis by the 2D-Fusion-CNN (ND+ NDP +PDP) in test set 1. 2D-Fusion-CNN combining pattern deviation probability plots (PDPs), numerical pattern deviation plots (NDPs), and numeric displays (NDs) as training data outperformed all the ophthalmologists with an AUC of 0.873.

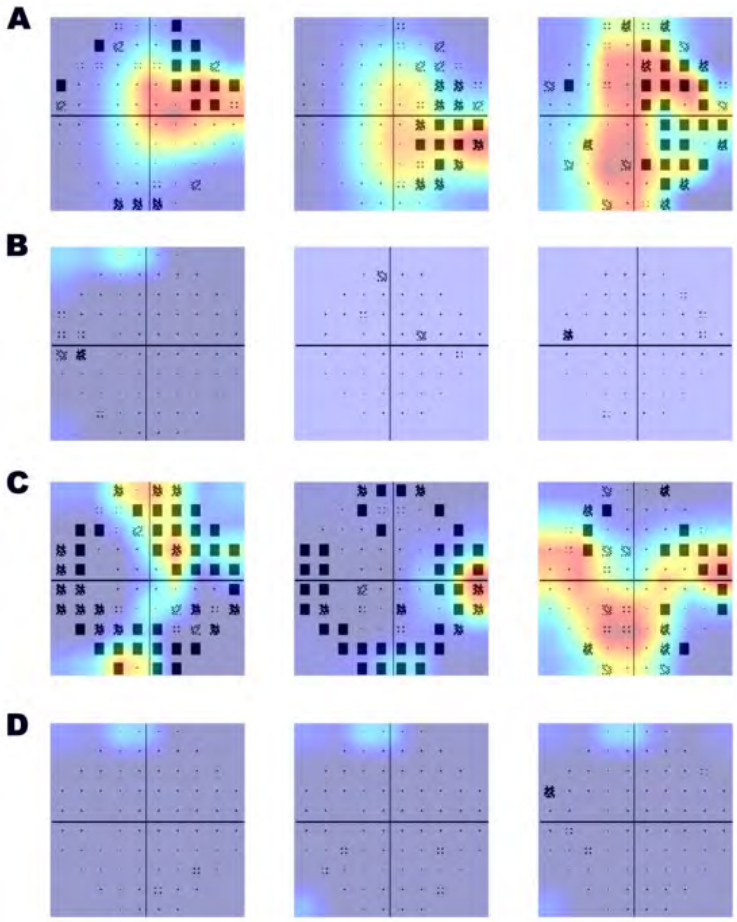

Figure 3. Representative heatmaps generated by the CNNs. The figure shows the heatmaps of the typical samples of eyes with and without glaucoma detected by the PDP-CNN. (a, b**)** The heatmaps generated in the true-positive and true-negative cases. (c and d) False-positive and false-negative cases.

GUIDE: GLAUCOMA UNITED INSPECTOR AND DECISION ENHANCER

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Introduction

Based on the follow-up data of the LiGHT China trial,[1] a large prospective trial, a clinical decision-making system for long-term management of open-angle glaucoma was developed to provide clinical guidance on whether patients need to adjust treatment during follow-up.

Methods

The decision model was built on the Catboost algorithm,[2] and 4,831 follow-up records were analysed. The features with little contribution to the decision were eliminated, while selected features were shown in the figure. Hyperparameters were optimized through grid search. Cross-validation was carried out for model evaluation. The gold standard was defined as a combined decision made through a guideline-based protocol followed by the adjustment from glaucoma specialists in the real-world setting.

Results

A total of 648 out of the 4831 follow-up records triggered the decision of treatment escalation according to clinical guidelines, and 160 of them were rejected by glaucoma specialists against the recommendation of treatment escalation, mainly because the visual field and cup-disc ratio were stable despite IOP above the target. For guiding whether the treatment needs to be escalated, the model achieved an area under the receiver operating curve (AUC) of 0.91, the accuracy rate is 0.94 in validation. The f1 score was 0.96 for patients who did not need to adjust treatment; 0.62 for patients who need to adjust treatment.

Conclusion

Decision on treatment adjustment is crucial in the long-term management of open-angle glaucoma but recent solutions simply based on guidelines suffer limited performance in real-world practice. Data-driven machine learning has the potential to learn from glaucoma specialists and provide more precise guidance, to improve the healthcare of open-angle glaucoma.

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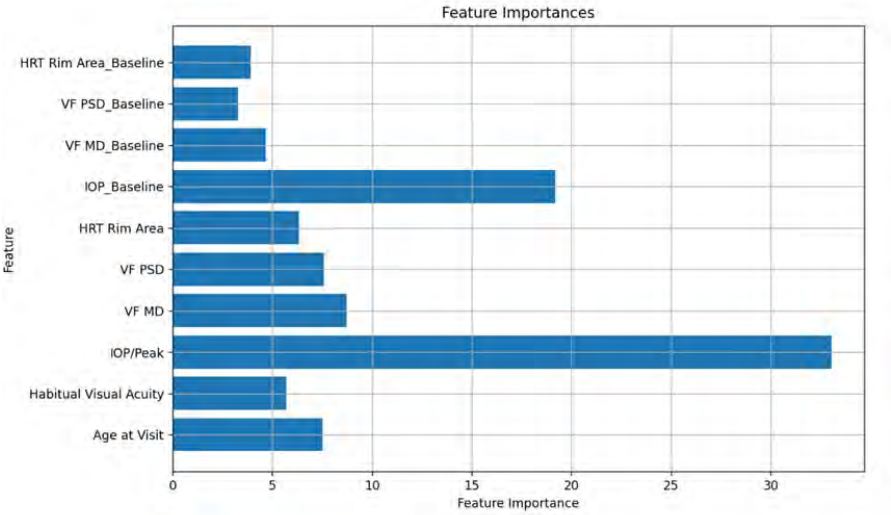
Figure



CASE SERIES OF GLAUCOMA DRAINAGE DEVICE TUBE EXPOSURE

Yogesvaran R, Muhd Nor N, Muji R

Background

Glaucoma drainage device (GDD) implantation is a popular procedure, but it is not without complications that may necessitate repeat surgery. We aim to report a series of GDD tube exposure and various managements.

Method

Case- series

Results

We report 3 patients who had GDD implantation due to neovascular glaucoma (NVG). Case 1 was a 45-year-old man with Ahmed Glaucoma Valve (AGV) implant in his right only seeing eye (OD). Four years post-surgery, he had a small, exposed tube overlying the scleral patch. One month later, he underwent tube revision with scleral and conjunctival graft, and remained stable 8 months post revision.

Case 2 was 55-year-old woman with bilateral eye (OU) GDD implantation. Seven years post-surgery, her left tube was noted to be exposed without any leak or infection. She refused surgery and used topical antibiotics for 2 years. During this period the exposed area increased to involve the entire length of the tube with anterior uveitis. At this point, she agreed for a repeat surgery and had her AGV explanted with implantation of a new Aurolab Aqueous Drainage Implant. She had well-controlled IOP 6 months post-surgery.

Case 3 was a 70-year-old man who had OU GDD implantation in 2012. His OD was hand movement due to decompensated cornea which was conservatively managed. Eleven years post-surgery he developed pinpoint tube exposure over his OD and was given topical antibiotics for 3 weeks. The exposed area widened, and he

opted for surgical revision. Unfortunately, 3 days later he returned with acute *Pseudomonas aeruginosa* endophthalmitis. His infection responded to intravitreal and systemic antibiotics. Once the inflammation resolved, tube explanation with conjunctival advancement was done.

Conclusion

GDD tube exposure is a major complication that may lead to devastating consequences. Conservative treatment may be a feasible option; however, early repair is advocated.

HYDRUS MICROSTENT IMPLANTATION FOR SURGICAL MANAGEMENT OF OPEN-ANGLE GLAUCOMA: A CASE SERIES

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Introduction

To report our initial experience with Hydrus Microstent implantation as a stand-alone procedure and in combination with phacoemulsification for the management of mild to moderate open angle glaucoma in Tengku Ampuan Afzan Hospital, Kuantan, Malaysia.

Methods

An interventional case series.

Results

A total of 6 patients aged 60 to 72 years old had undergone the surgeries from 29/8/23 to 14/11/23 in Tengku Ampuan Afzan Hospital, Malaysia. All patients had primary open-angle glaucoma, with 2 patients having mild disease while the other 4 patients with moderate disease. The mean HVF 24-2 MD was -6.08 ± 1.96. Four patients underwent combined Hydrus microstent implantation and phacoemulsification/intraocular lens, and another 2 patients had a standalone Hydrus microstent implant. The mean preoperative intraocular pressure (IOP) was 17.2 ± 5.15, best-corrected visual acuity (BCVA) was 0.39 ± 0.36 (logMar) and the mean number of glaucoma medications was 2.67 ± 1.37. Postoperative day 1 showed the IOP reduced to a mean of 9.50 ± 2.17, mean BCVA was 0.57 ± 0.63, and the mean number of glaucoma medication was 0.17 ± 0.41. At week 1 postoperative, mean IOP, mean BCVA and mean number of glaucoma medications were 13.2 ±6.40, 0.14 ± 0.15 and 0.33 ± 0.52, respectively. At month 1 postoperative, the mean IOP was 10.5 ± 11.0, mean BCVA were 0.26 ± 0.39 and mean number of glaucoma

medications was 0.33 ± 0.82. At 2 months the mean IOP, mean BCVA, and mean number of medications were 12.2 ± 2.23, 0.13 ± 0.14, and 0.33 ± 0.52, respectively. Intraoperatively, all patients had blood reflux from the angle. One patient had anterior chamber washout done and another patient developed hyphaema postoperatively. The rest of them were uneventful.

Conclusion

Our early experience with Hydrus Microstent implantation and a short postoperative follow-up for POAG patients showed it safely and effectively lowers the IOP and reduces the number of glaucoma eyedrops.

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THE INHIBITORY EFFECT AND MECHANISM OF PUERARIN ON FIBROSIS IN IN VITRO 2D AND 3D CULTURED HUMAN TRABECULAR MESHWORK CELLS

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Introduction

To investigate the antifibrotic effects and mechanisms of Puerarin on the in vitro 2D and 3D culture of human trabecular meshwork cells (HTMC).

Methods

Puerarin at concentrations of 0 to 3 mg/ml was applied to HTMC with or without TGF-β2 stimulation. After 24 hours, CCK-8 assays were conducted to measure cell viability. Scratch assays were performed to evaluate cell migration ability. 3D HTMC was established by a Matrigel and observed by a phase-contrast microscope. Western blot, immunofluorescence were employed to assess the expression of molecules in the TGFβ-Smad pathway.

Results

1. Puerarin decreased 2D cell activity, while with same concentrations, 3D cell activity was higher. 2. Scratch assays indicated that Puerarin could downregulate TGF-β2-induced HTMC migration in a dose-dependent manner. 3. After 48 hours of 3D cultivation, HTMC formed a network, while TGF-β2 treatment led to rearrangement of the cell skeleton, forming highly disordered cross-linked bundles. Puerarin treatment resulted in HTMC cell contraction and increased cell spacing. 4. TGF-β2 increased the expression of Smad2/3, α-SMA, fibronectin, collagen I, and IV, while Puerarin reduced the expression of these proteins.

Conclusion

Puerarin at non-toxic concentrations can inhibit fibrosis in 3D cultured HTMC in vitro. The possible mechanism involves maintaining HTMC activity, decreasing migration capability, and partially reversing cell skeleton rearrangement and fibrotic changes induced by TGF-β2.

REDUCTION IN MAXIMUM CILIARY BODY THICKNESS IS A PRE-EXISTING PREDICTOR FOR PSEUDOPHAKIC MALIGNANT GLAUCOMA

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Introduction

Malignant glaucoma is a rare and vision threatening form of glaucoma occurring in certain postoperative patients. It presents difficult diagnostic challenge. Our study was conducted to identify morphometric indicators for predicting the development of pseudophakic malignant glaucoma (PMG).

Methods

A cross-sectional study was conducted from June 2016 to May 2023. A total of 53 patients (60 eyes) with primary angle-closure glaucoma before phacoemulsification were recruited, and 23 patients (30 eyes) developed PMG. Parameters such as central anterior chamber depth (ACD), trabecular-ciliary process angle (TCA), ciliary body thickness (CBTmax, CBT0, and CBT1000), and anterior placement of ciliary body (APCB) were measured by ultrasound biomicroscopy at pre-phacoemulsification, onset of PMG and 6-month after settlement of PMG.

Results

At pre-phacoemulsification, a significant reduction of CBTmax (0.87 ± 0.09 mm vs 0.95 ± 0.09 mm, P = 0.001) was detected in the eyes that developed PMG, when compared to the matched eyes. Lens extraction increased the CBTmax in matched eyes, but no such increases were observed in those developed PMG, suggesting an association of these parameters with PMG occurrence. Furthermore, zonulo-hyaloido-vitrectomy increased the ACD and TCA in patients with PMG resolved, which was accompanied with an increase in CBTmax and CBT0, but not CBT1000 and APCB. Notably, CBTmax was the only factor producing significant prognostic

value (0.74 [95% CI, 0.61-0.87]) at pre-phacoemulsification, which almost reached the predictive ability at PMG attack (0.86 [95% CI, 0.76–0.96]).

Conclusion

A reduction in thickness of the ciliary body pre-exists in eyes with PMG, of which a reduced CBTmax may serve as an early predictor.

THE RISK FACTORS OF SHALLOW ANTERIOR CHAMBER AFTER CHOROIDAL DETACHMENT IN PATIENTS WITH GLAUCOMA SURGERY

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Introduction

This study aims to analyse the risk factors and clinical characteristics of eyes with shallow anterior chamber following choroidal detachment.

Methods

The data of patients developing choroidal detachment following glaucoma surgery were collected in this study. Patients were divided into two groups based on the presence or absence of a shallower AC after choroidal detachment compared to preoperative clinical records. The clinical characteristics of eyes with shallower AC were compared to controls that exhibited unchanged AC after choroidal detachment.

Results

Among 3,492 eyes undergoing glaucoma filtration surgery, 99 eyes (2.84%) developed choroidal detachment. Of these, 77 eyes met the inclusion criteria, with 52 having shallower AC and 25 with unchanged AC. A comparative analysis was conducted between 25 eyes with unchanged AC and 25 age- and gender-matched controls with shallower AC after choroidal detachment. The preoperative anterior chamber depth was smaller in the shallower AC group (2.43 ± 0.66mm) than in unchanged AC group (2.96 ± 0.33 mm) ($P = 0.002$). The shallower AC group exhibited a smaller preoperative anterior chamber width (ACW) (10.90 ± 0.49mm) than unchanged AC group (11.95 ± 0.66mm) ($P < 0.001$). There was higher proportion of angle closure glaucoma (14 eyes, 46%) in shallower AC group than in unchanged AC group (7 eyes, 28%) ($P = 0.045$). In the multivariate analysis, only smaller ACW (odds

ratio (OR) = 1.746 per 0.1 mm decrease, 95% CI: 1.263–2.414, P = 0.001) was significantly associated with the shallower AC.

Conclusion

The incidence of choroidal detachment following glaucoma surgery was 2.84%. Smaller ACW was the risk factor for shallower AC after choroidal detachment.

A RARE CASE OF UNILATERAL PRIMARY ANGLE-CLOSURE GLAUCOMA WITH ICE SYNDROME IN FELLOW EYE

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Introduction

Angle-closure glaucoma can be divided into primary and secondary depending on the aetiology. Primary angle-closure glaucoma (PACG) is usually bilateral but in this case was unilateral. The other eye had secondary glaucoma, namely iridocorneal endothelial (ICE) syndrome.

Methods

A 66-year-old woman presented pain and blurred vision. Visual acuity in the right eye was 6/7.5 and 3/60 in the left eye, IOP was 17 mmHg and 31 mmHg. The right eye showed a "hammered silver" cornea, extensive iris atrophy and the gonioscopy showed wide peripheral anterior synechiae (PAS). The left eye showed flat bleb, peripheral corneal oedema, iris pigmentation on the corneal endothelium, shallow anterior chamber, iris atrophy, and 360-degree posterior synechiae, no coloboma, cloudy lens, and iris pigmentation on the lens. Pupils were mid-dilated with negative pupillary reflex. Gonioscopic examination revealed a closed angle with PAS. Funduscopic examination was normal in the right eye and glaucomatous optic neuropathy in the left eye. From specular microscope examination we obtained decreased corneal cell density of right eye 855 cell/mm^2 and left eye 1,121 cell/mm^2 The patient was diagnosed with right eye ICE syndrome and left eye PACG. Re-trabeculectomy and extracapsular cataract extraction with intraocular lens implantation were performed on the ocular lens implantation in the left eye. Antiglaucoma medication was continued with timolol maleate 0.5% ed bid, latanoprost 0.005% ed qd. and oral acetazolamide 250 mg qd to control IOP before surgery.

Result

One week after surgery, left eye visual acuity was improved to 6/30 and the IOP was stable at 17 mmHg without glaucoma medications. The right eye visual acuity was 6/15 and IOP stable at 19 mmHg with 2 topical glaucoma medication.

Conclusion

A comprehensive clinical examination plays an important role in defining the diagnosis and selecting appropriate therapy.

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