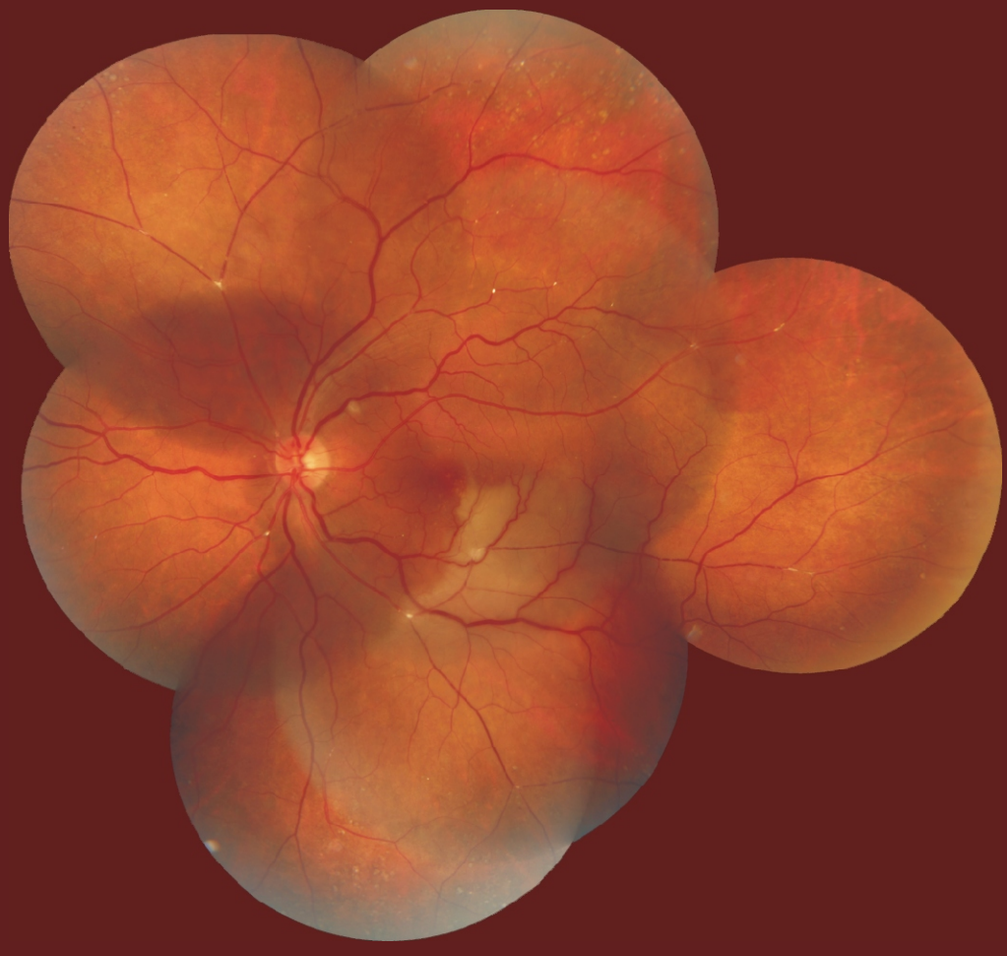
MARCH 2020

The Official Newsletter of the

VITREO RETINAL SOCIETY-INDIA



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References:
1. CHRISTIAN PRÜNTE, NICOLE ETER Retina Today - March 2018

Contents

From the President's Desk

Dr. Shobhit Chawla
Medical Director and Chief - Vitreo Retinal Services
Prakash Netra Kendr
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Dear Friends and colleagues

Wish you all a happy Holi. As we move ahead in the year 2020, with hope despite issues which confront the world at this time.

Our scientific convenor has conceptualised an interesting newsletter with a surgical scenario roundup edited by RamandeepSingh. Besides this, we have most of the highlights of our awards sessions in the newsletter . Once again I wish you a pleasant, safe festive week.

Greetings and Regards

Warm regards
Dr. Shobhit Chawla
President
Vitreo-Retinal Society of India

From the Honorary Secretary's Desk

Dr. Raja Narayanan
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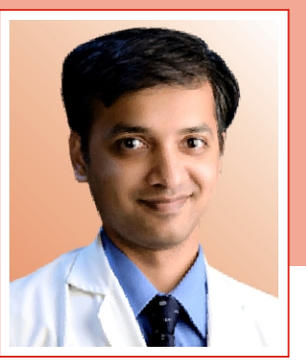

Dear Friends

Warm greetings from VRSI! We had a wonderful annual conference of VRSI at Lucknow in December 2019. The memories are still fresh, and you may browse all the photographs of the event at www.vrsi.in. An excellent issue of VRSI Newsletter of 2020 has been compiled by Dr. Anand Rajendran and his team. I am sure that you will find the articles extremely valuable for your daily practice, and to provide the best care to your patients. I take this opportunity to request you all to submit your interesting cases, articles and innovations to the VRSI newsletter, which will help improve the scientific knowledge base of our members.

Preparations for our XXIX annual meeting at Nagpur from Dec 3-6, 2020 are under way. Dr. Prashant Bawankule is spearheading a motivated team to organize the conference, along with an opportunity to undertake “Tiger Safari” around Nagpur. A galaxy of expert faculty has agreed to participate in this scientific extravaganza. Don’t miss the opportunity to personally interact and learn from them. To register for the conference, please visit our website. I request you all to participate enthusiastically in the activities of VRSI.

Regards
Dr. Raja Narayanan
Hon. Secretary
Vitreo-Retinal Society of India

From the Convenor, Scientific Committee's Desk

Dr. Anand Rajendran
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Dear Friends and Colleagues

It has been a pleasure bringing out the March edition of the VRSI Newsletter, the first of the new academic year. I would also take the opportunity to thank all the faculty and delegates for contributing and making the Annual Conference at VRSI 2019 in Lucknow a stupendous success. The Local Organising Committee led ably by our President Dr. Shobhit Chawla, and Dr. Mohit Khemchandani, Organising Secretary did an outstanding job in hostingan extraordinary cultural, artistic and gastronomic fest. I also thank the International Faculty for travelling great distances, delivering memorable didactics, enriching and making the Meet one of the most vibrant in the Asia Pacific region.

The current issue pays tribute to our many award winners at the VRSI 2019 Meet. We have Dr. Hassan Mortada, a world renowned retina surgeon from Cairo and the worthy recipient of the Nataraja Pillai Oration giving us an elaborate account of "Vitreoschisis and Retinoschisis in Pathological Myopia" in the 'Stalwart Speak' section. The Spotlight article of the issue, anchored by Dr. Ramandeep Singh and Dr. Uday Tekchandani, is focused on "Management of Difficult Situations in Retinal Surgery" with an eminent panel of national experts holding forth on these challenging surgical situations. Few people have made a pathology as inseparable from their name as Dr. Subhadra Jalali has with ROP. The recipient of the Patnaik Oration, she captures her unique saga and engagement with ROP in a gripping account. The Retina Tech corner has Dr. Aniruddha Agarwal, deserving winner of the Professor Namperumalsamy Young Researcher Award offering us a fine account on Cutting edge Retinal Imaging today. In the Innovator's Isle section, Dr. MuditTyagi, describes his ingenious and novel surgical technique of Fibrin Glue assisted Retinal Break closure and settling detachments, an effort that won him the Innovation of the Year Award at VRSI 2019. Finally, Dr. Dhananjay Shukla, in his inimitable style, describes his Top 7 Impactful articles of the Year in the Retina Roundup 2019, cherry-picked from our monthly Retina Roundup bulletins.

We look forward to contributions from all members to future issues. We will be opening the Abstract Submitter soon for the VRSI 2020 Annual Conference to be held at the Centre point and heart of our Nation –Nagpur from Dec 3-6 2020. We hope to see the same enthusiastic response as we have last year and welcome your whole-hearted participation and involvement.

Dr. Anand Rajendran
Convenor
Scientific Committee
Vitreo-Retinal Society of India

Guidelines - Manuscript Submission for VRSI Newsletter

Original articles:

These include randomized controlled trials, intervention studies, studies of screening and diagnostic test, outcome studies, cost effectiveness analyses, case-control series, and surveys with high response rate. The text of original articles amounting to up to 3000 words (excluding Abstract, references and Tables) should be divided into sections with the headings Abstract, Key-words, Introduction, Material and Methods, Results, Discussion, References, Tables and Figure legends.

Case reports / Challenging case /Innovations / Instruments /Techniques :

New, interesting, challenging, rare cases, innovations, instruments and techniques can be reported. They should be unique and providing learning point for the readers. Manuscripts with clinical significance or implications will be given priority. These communications could be of up to 1000 words (excluding Abstract and references) and should have the following headings: Abstract (unstructured), Key-words, Introduction, Case, Discussion, Reference, Tables and Legends in that order.

The manuscript could be of up to 1000 words (excluding references and abstract) and could be supported with up to 10 references. Case Reports could be authored by up to four authors.

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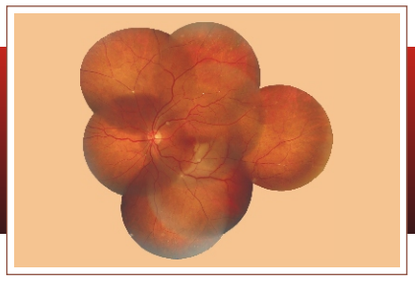

The Cover Page Image " Infarcted Eye" was contributed by Dr. Abhishek Kothari, Pink City Eye Care, Jaipur.

STALWART SPEAK - NATARAJA PILLAI ORATION AWARD

Vitreoschisis and Retinoschisis In Pathological Myopia

Dr. Hassan Mortada, MD
Professor
Cairo University, Egypt

The concept of splitting of the retinal layers was known since 1958 when first described by Calbert Phillips. However it was not until the advent of Optical Coherence Tomography (OCT) when this pathology was studied with more depth. The term Myopic Foveoschisis was first suggested by Takano in 1999 to describe the separation of retinal layers in patients with degenerative myopia coupled with posterior staphyloma.

With further advancement in imaging technology and the introduction of spectral domain OCT which is capable of taking more scans per second and thus much higher resolution, it became more obvious that myopic foveoschisis together with some other macular pathologies that occur in high myopes are a spectrum of the same dynamic process that occurs due to the action of different dragging forces on the macula and hence the term Myopic Traction Maculopathy (MTM) introduced by Panozzo. The term accurately describes a group of macular disorders that occur in high myopes due to traction forces.

Forces acting on the posterior pole in pathological myopia include (Fig 1a,b,c)

1- Adherent, partially detached posterior hyaloid (PH) traction, with or without vitreoschisis (Anomalous posterior vitreous detachment, A-PVD)

2- Altered, rigid internal limiting membrane (ILM)

3- Rigid (potent) retinal arterioles

4- Progression of the posterior staphyloma

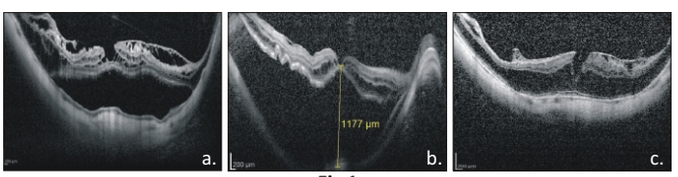

Fig 1

The hypothetical mechanism of myopic retinoschisis is that the rigid layers namely the partially adherent PH, epiretinal membranes, ILM and the inner retinal layers containing the rigid retinal vessels split from the more flexible outer retina, choroid and retinal pigment epithelium (RPE), under the inward traction force of the partially detached PH and the outward force exerted by the backward elongation of the sclera at the posterior staphyloma (Fig 2)

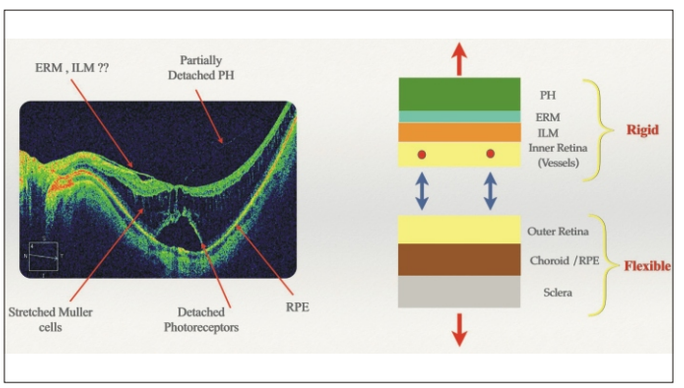

Fig 2

The spectrum of myopic traction maculopathy (MTM) includes:

1- Myopic macular retinoschisis

2- Myopic macular hole without retinal detachment

3- Myopic macular hole retinal detachment (Fig. 3)

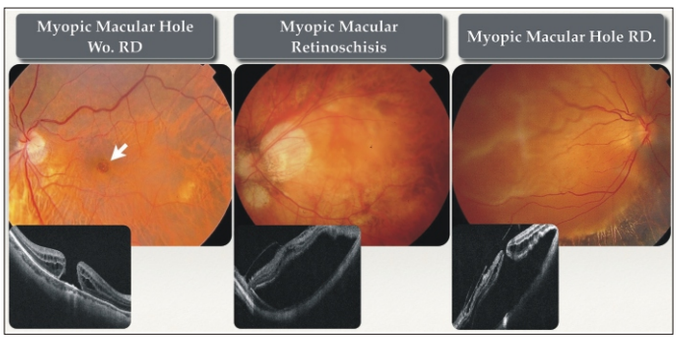

Fig 3

These three clinical entities are not separate. It is widely agreed now thatmyopic foveoschisis is the initial stage of the process which can progress to foveal detachment, lamellar hole or full thickness myopic macular hole all of which are placed under the term MTM (Fig. 4)

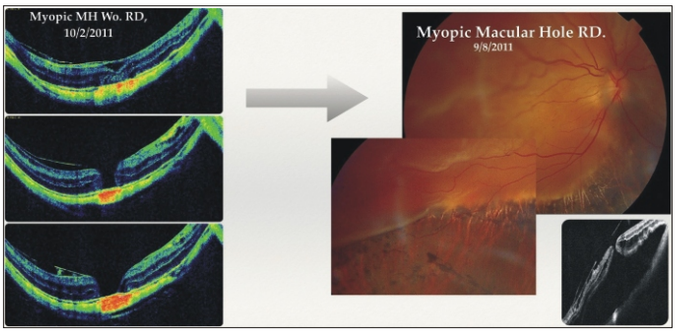

Fig 4

When a patient with pathological myopia is confirmed to have MTM by OCT, the management is either watchful waiting or surgical intervention.

The indications for surgical interventionare: (Fig 5, 6 a, b)

1- Progressive diminution of vision, more than 2 lines on Snellen's chart within the past 6 months

2- Metamorphopsia and distorted vision

3- Foveal detachment

4- Full thickness macular hole

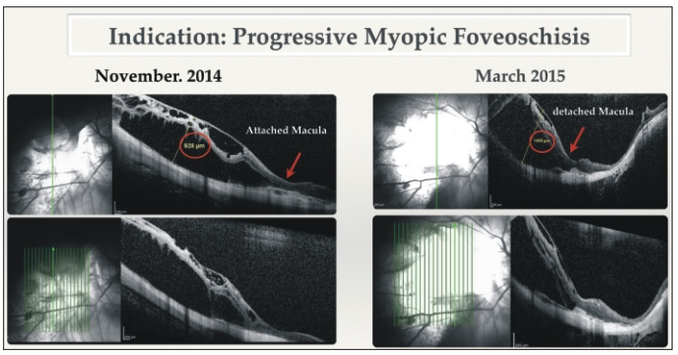

Fig 5

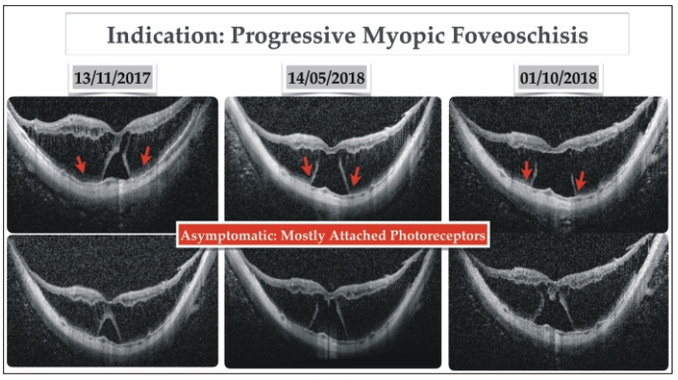

Fig 6 a

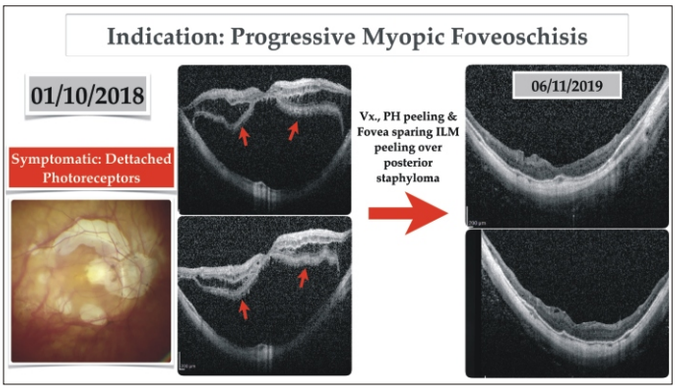

Fig 6 b

Surgical Technique: The basic pars plana vitrectomy is applied, including excision of core vitreous gel, induction of PVD and excision of posterior hyaloid and shaving of basal vitreous gel. However, a myriad of variations and extra steps that could be added to the basic procedure exist, owing to the special nature of highly myopic eyes and the surgeries for MTM.

1. Small gauge vitrectomy systems (23 or 25) are advantageous especially in the presence of thin sclera of high myopes. Also the rate of complications is much lower with small gauge systems.

2. The use of Triamcinolone Acetate (TA) to highlight the vitreous gel is crucial to ensure complete excision of the vitreous gel, induction of PVD and complete excision of posterior hyaloid. This has special importance in eyes with pathological myopia and MTM. This is because of the high incidence of vitreoschisis in eyes with longer axial length and posterior staphyloma. There is a high possibility of finding an adherent layer of cortical vitreous after what is thought to be a complete PVD. So, staining and even double staining with TA is strongly advisable during PPV for MTM (Fig.7)

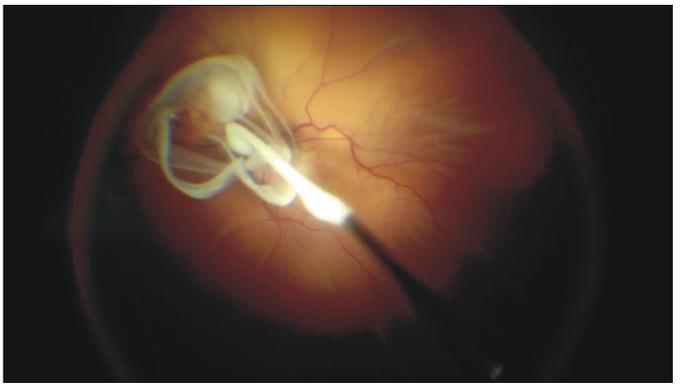

Fig 7

3. Strong paravascular vitreoretinal adhesion is not uncommon in eyes with pathological myopia. Accordingly, induction of PVD should be done cautiously over retinal vessels to avoid iatrogenic paravascular retinal tears or hemorrhage.

4. PVD should be extended to the posterior border of the vitreous base. In high myopia, the latter is usually more posteriorly located than in emmetropic eyes. So, PVD should be done under direct visualization and stopped once circumferential traction line is observed. Failure to do that may result in iatrogenic multiple horse shoe tears or even giant retinal tear.

5. The axial length of highly myopic eyes may be longer than the shaft of regular instruments. This problem may be solved following one or more of the following:

   a. Tilting the position of the head towards the working field
   b. Temporary removal of the cannula, introducing regular instruments directly through the sclerotomy.
   c. Use instruments with long shafts designed for working in highly myopic eyes.

6. **Surgery of Internal Limiting Membrane (ILM):**Routine peeling of the ILM, with some modifications, is strongly advocated in all cases of MTM for the following reasons:

   a. In eyes with MTM, the ILM is abnormally tight and thickened. It is considered the most rigid structure over the posterior staphyloma. This results in failure of the inner retina to comply to the shape of the posterior staphyloma as the outer retina. Accordingly, ILM peeling over the posterior staphyloma, increases the elasticity of the posterior retina allowing it to conform to the concavity of the posterior staphyloma.
   b. ILM peeling ensures complete removal of any adherent cortical vitreous, epimacular membranes thus relieving tangential traction.
   c. ILM peeling eliminates the scaffold for further cellular proliferation and epimacular reformation.

ILM staining is mandatory in highly myopic eyes with MTM. This enhances the visibility of the ILM in presence of poor contrast caused by myopic choroiretinal degeneration and atrophy, a common finding in these eyes.

Brilliant blue dye is the first choice to stain the ILM during peeling. ILM peeling is particularly challenging in these eyes. So, double and sometimes triple staining may be necessary to augment the ILM staining for better visualization and safer peeling.

Surgery on ILM varies according to the pathological entity of MTM: Myopic Foveoschisis (MF), Myopic macular hole without retinal detachment(MMH) or Myopic macular hole retinal detachment (MMHRD):

Myopic Foveoschisis: Fovea sparing ILM peeling (Fig 8 a, b, c) ILM surgery should start just central to the inferior temporal arcade, using either the pinch technique with ILM forceps or first elevating an ILM flap using Tano's scraper, Finesse Flex loop or the tissue manipulator. Once a flap or flaps are created, peeling is done using forceps working always toward the fovea so as not to exert any traction on the fovea. ILM peeling should stop 500 u from fovea. The same is repeated from all directions stoping short of the fovea. At the end, ILM is peeled over the whole area of the posterior staphyloma sparing the fovea. Excess ILM may be excised with the cutter using low vacuum and low cutting rare.

Provided no operative complication is encountered, there is no need for tamponade or fluid/air exchange is performed.

It is strongly believed that in symptomatic MF, PH and ILM peeling across the posterior staphyloma, sparing the fovea, is associated with excellent anatomical and functional results. It may eliminate the risk of postoperative macular hole formation.

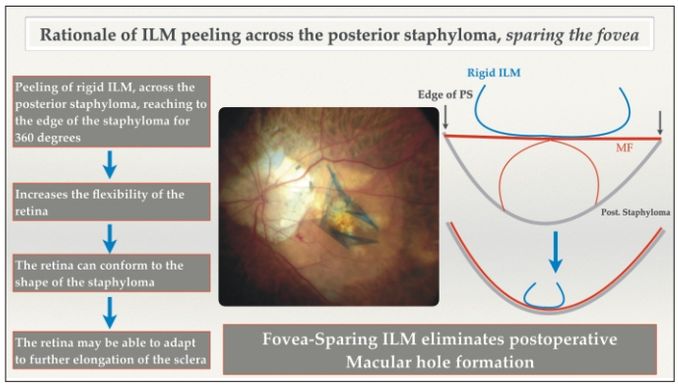

Fig 8a

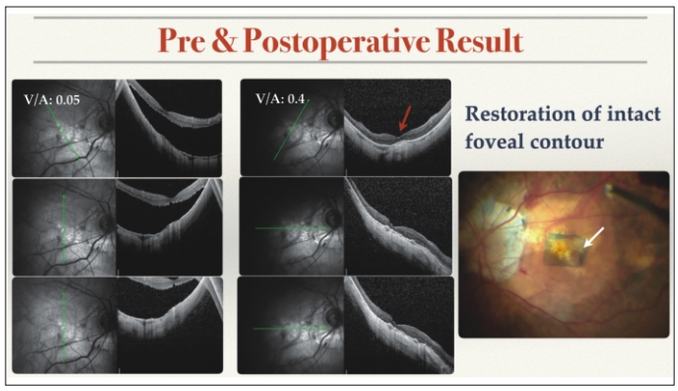

Fig 8b

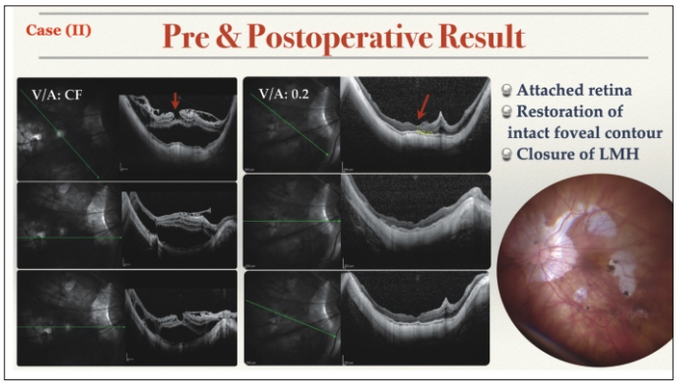

Fig 8c

Myopic Macular hole without Retinal Detachment: Multi-layer ILM flap, *Envelop Technique*. (Fig 9 a,b)

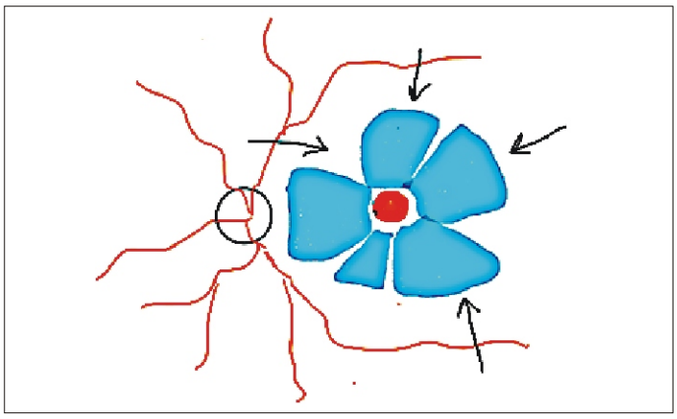

Fig 9a

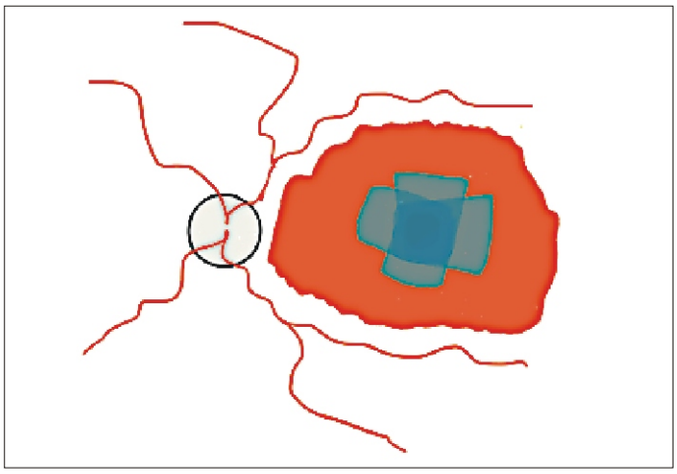

Fig 9b

Initially the technique is the same as described in MF. The ILM peeling is stopped 500 u from the edge of the macular hole. Under Perfluorocarbone liquid (PFCL) bubble, ILM flaps from all directions, are brought over the macula hole, one over the other, like an envelop. The volume of air injected in these large eyes is sufficient to provide the required tamponade. The patient is instructed to adopt the face down position for 5 days (Fig. 10)

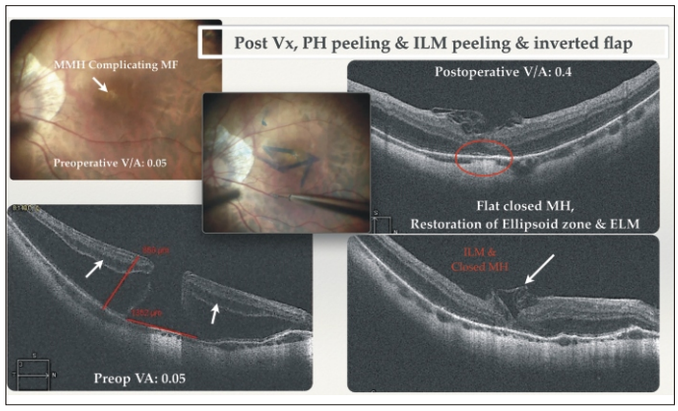

Fig 10

This multi-layer (Envelop) technique is associated with almost 100% flat closure of the MH., because of the following advantages:

a. Confirmed placement of the ILM flaps over the MH under PFCL or air, provides scaffolds for Muller cell proliferation and photoreceptor migration to close the hole.
b. The ILM flaps are kept inverted in place. No possibility for displacement or reversion of the flaps.

Myopic Macular hole retinal detachment: 2 clinical presentations

1- Retinal detachment confined to the posterior staphyloma: (Fig. 11)

With a detached retina, ILM peeling is started just nasal to the optic disc, using the latter as an axis. ILM peeling is carried out towards the macular hole and stopping as previously described 500 u form the edge of the hole. Under few CCs. of PFCL, ILM flaps, peeled from all directions are brought over the macular hole, one over the other, like an envelop. Finally, fluid & PFCL are exchanged with air. No drainage of the sub retinal fluid (SRF) is required as this may jeopardize the ILM flaps. No need to use long acting gas. Patient is instructed to adopt a face down position. The SRF usually absorbs in 24 hours.

2- Retinal detachment reaching to the periphery

Following proper ILM staining with BB, the retina is attached with PFCL injection. As previously described, ILM peeling is started at the nasal edge of the optic disc and carried out towards the MH and stopping 500 µm from its edge.

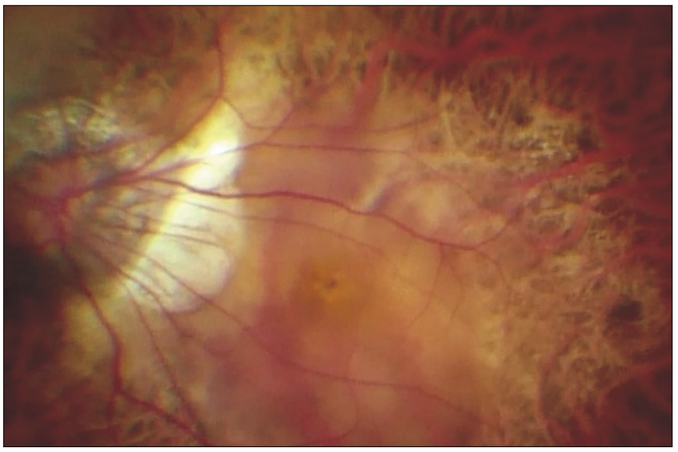

Fig. 11

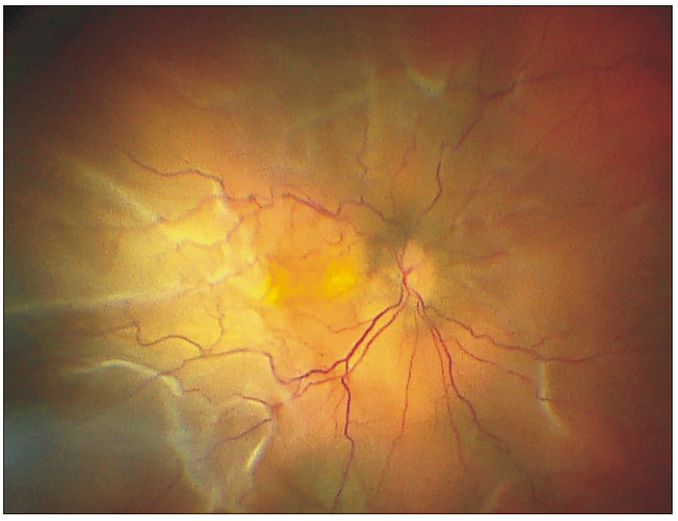

Fig 12

The ILM flaps are brought over the macular hole one over each other. A small graining retinotomy is made, with the cutter, at the most peripheral extent of the SRF. More PFCL is injected to achieve complete retinal reattachment, draining the SRF through the peripheral retinotomy. In absence of PVR, air or SF6 is the proper tamponade. Silicone oil is used in more complicated cases with PVR. (Fig 13, 14)

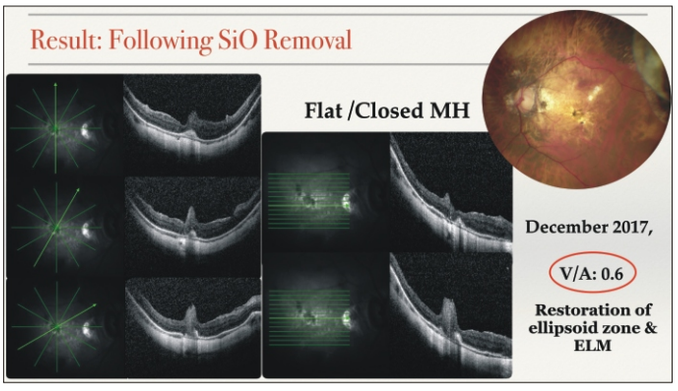

Fig 13

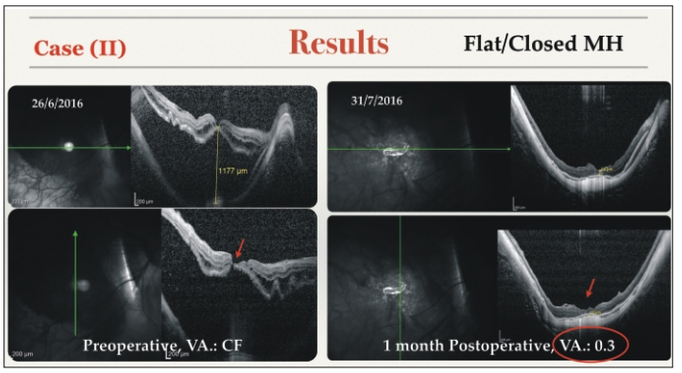

Fig 14

Summary and Conclusions:

- In pathological myopia, anomalous PVD, vitreoschisis, rigid ILM and posterior staphyloma are the main factors contributing to tractional forces acting on the posterior pole and resulting in MTM with a wide range of clinical entities
- The use of TA to highlight vitreous gel is indispensable for proper visualization of vitreous layers and cortical vitreous adherent to retinal surface.
- ILM is the most rigid structure at the posterior pole. Peeling of BB stained ILM to the edge of posterior staphyloma is mandatory. It increases the flexibility of the retina and subsequently can conform to the shape of the posterior staphyloma.
- In myopic foveoschisis, fovea-sparing ILM peeling is associated with excellent anatomical and functional success results. It may eliminate the risk of postoperative macular hole formation.
- In myopic macular holes with and without retinal detachment, combined ILM peeling to the edge of the staphyloma and multi-layer ILM flap (Envelop) technique is associated with almost 100% flat closure of the hole and retinal reattachment.
- The Macular buckling technique is rarely needed in MTM.

PATNAIK ORATION 2019

A life of Sight: From ROP local to ROP Global

Dr. Subhadra Jalali (Kaul)
Director Retina Institute
Newborn eye Health Alliance (NEHA) and Quality
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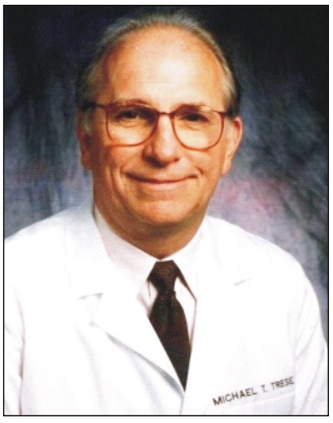
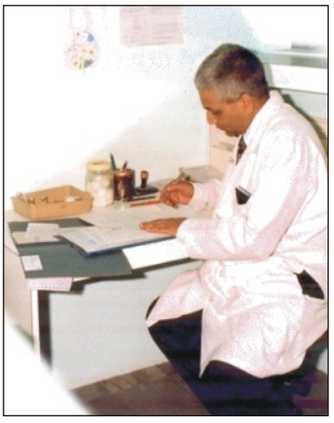
The year was 1997, nearly 7 years after the current retina service had been started at LVPEI by Dr. Taraprasad Das in 1990. We saw 8 ROP stage 5 blind babies that year. ROP before that was something called Retrolental fibroplasia that we read in books perhaps for an exam, something that was connected to a Cryo-ROP trial ***FOR*** the western nations, something that had empty halls in the last laid out AIOS Instruction courses and something that was too far away and too difficult that could be done only by **excellent**, **senior Indian VR surgeons.** Drs. Lingam Gopal (SN Chennai), Prof. R V Azad (RP Centre, Delhi) Dr. Mangat Dogra (PGIMER, Chandigarh) and also Dr. Kairobi Lahiri (Bombay Hospital, Mumbai). I flew into the completely unknown (to me) ROP world, when I landed at Michigan USA in May 1998 coaxed by Dr. Das to get trained with the best, Dr. Michael Trese (William Beaumont Hospital, Detroit).





Acharya devobhava: Prof. Michael Trese, Detroit, Michigan and Dr.Taraprasad Das, Hyderabad Trained and encouraged me respectively to begin ROP work. Started in 1998

A whole new world opened up in the three months that I was there. Facts about ROP emerged. It is not an ancient or inevitable disease. The first incubators were set up in Boston Childrens' hospital in 1941 and the first retrolental fibroplasia blindness was reported in 1942- a clear connection between incubators, preterm baby survival and irreversible very early age (usually within 6 months of birth) childhood blindness. However, the most exciting learning for me was that ROP was absent at birth and it evolves slowly while the baby is with child health care team, thus providing an opportunity for primary and secondary blindness prevention. Also very heartening was that the disease allows a window of 2-14 days in the disease process where one can examine the retina, watch if disease is vision threatening and plan management; management with lasers at that time was highly effective- more than 80 to 90 percent affected got good vision.

Earlier, in May 1997, I myself had a 28-week preterm delivery. I spent 25 days in the NICU with my baby. This experience was an eye-opener. The tremendous efforts, organization and resources of parents, staff, neonatologist and hospital administration that go into saving life of one preterm baby is seen to be believed. The news that the child will be blind forever with no prospects of cure comes like devastating news to the parents, physicians and other family members. The knowledge that this was largely avoidable by screening for less than 10 minutes, at 20-30 days of life compounds the misery. Hundreds of NICU were being set up in India and other neighboring countries, but no ROP screening was planned in 1990s when the first reports of ROP started emerging from India (this is true in many places even now in the year 2020- so very sad!) On my return from USA, ROP became a mission for me since then.

Following Unique steps were taken:

1. Mapping of all NICU in our Twin cities was done by contacting the incubator companies (fortunately only two at that time) and getting all incubator centres list from them. Then physically meeting each NICU head to explain about ROP and need for screening. Most shut their doors on me. Initially two hospitals opened the doors, Basant Sahney and Fernandez, followed slowly but steadily by almost all Twin city neonatal hospitals. Our integrity, punctuality, discretion, professional work, with only the baby at the centre of the program worked in our favour.

At that time this appeared to be the most logical thing to do-take care of all babies in more than 20 hospitals across the twin cities!! Once a week morning till evening travel across length and breadth in traffic and then go with Laser machine (LIO) in the night (in boot of my car) to treat that one or more baby we detected. Little did I know I was the only one taking care of whole city at bedside of each baby, in India (and in many other countries) at that time!

2. Collected each visit data on a prospective computerized database (developed in house) and presented this at city neonatologists meeting after 9 months. This created an ROP buzz in the academic and practitioner circles. Over the years this has resulted in a stream of ITCROPS publications, including an IJO platinum award. Database has more than 20,000 babies, followed many of them, from neonate to 18 years of life.

3. Coined the slogan 'Tees Din Roshni Ke' (Thirty days for vision- screen within thirty days of birth) like Do Boond Zindagi ke (Polio program slogan) to put ROP screening at par with Polio prevention. This was best comprehensible to health workers and parents rather than the cumbersome gestational age based ROP screening schedule put forth by the ROP National guidelines of western developed countries. In a country where a large majority of women do not know LMP/Gestational age/ PMA/ antenatal check, this was the only way to get babies on time for ROP management. This single most operational step has received worldwide acceptance and acclaim for its simplicity and easy benchmarking, the time of first ROP screening.

4. Became a member of the National Neonatology Forum (NNF) so as to get information of every scientific meet in any part of India related to neonates. Started inviting myself to these meetings, distributing flyers one on one to all delegates, standing for hours at the lunch area gate (still do so); requesting free space in trade area, putting flyers in delegate bags, putting up small video clips on my laptop and soliciting delegates to please come and visit the remote corner in the meeting where organisers would give me free space and so on. After NNF ROP guidelines were published in 2010, printed 10,000 of these and distributed to all neonatal hospitals across India whose address I could get. Most of these were NICU from where blind babies came. Few extra minutes to capture all hospital NICU addresses from each OPD patient became mandatory so as to send them feedback. If a blind baby came from a centre, the next one should not come again from that place became an obsession. Awareness creation took away every weekend and every moment of my available time for next decade (still on going).

5. Started the first one month hands-on ROP screening and laser course that is now become the most sought after training program, having trained more than 350 doctors and counting!

6. Numerous, almost monthly ROP campaigns on each and every media and each and every opportunity became my obsession. This helped to reach out to so many segments of society and stakeholders.

7. Side by side started basic science research to understand pathogenesis and find a biomarker for ROP in serum and later in tears, in collaboration with my basic science colleague Dr. Inderjeet Kaur.

8. Collaborated closely with other colleagues across India and abroad. A basic practice article in IJO (2003) on “Setting up ROP screening program' brought me my first International invitation by Prof. Clare Gilbert (Childhood blindness expert) in IAPB annual meet. Small step leading to a giant leap!

9. My endeavour to translate information available in books and journals to actual implementation at the bedside of the neonate using very simple algorithms has resulted in a changed scenario in our twin cities and is slowly also having a rippling effect at places as far away as Indonesia and Azerbaijan. ROP is no longer done by 'elite doctors'. Any good eye specialist could get trained in a month and at least start screening if not lasers. It became a Community clinic care model and not a tertiary centre based model.

10. Over the years I have tried to analyze the prospectively collected Indian twin Cities ROP study (ITCROPS) data scientifically and improvise our strategies continuously in an attempt to achieve better outcomes.

Setting up of the first Newborn care unit in India, within an eye institute. Dr. Padmaja K. Rani with well trained staff to handle post operative High risk hbabies.

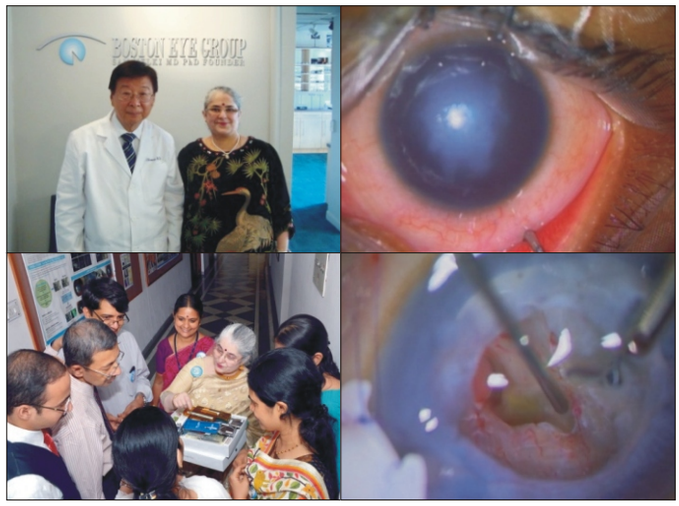
Some of the other highlights of my professional work with ROP are :

- ***Played a pivotal role in the control of visual loss from retinopathy of prematurity not only in India but also in countries including Bangladesh, Phillipines, Indonesia and African continent etc.***

- ***Established a highly effective program for detecting and treating sight-threatening retinopathy of prematurity in neonatal care units across Hyderabad and a tertiary level centre of excellence for treating end-stage ROP, which requires highly complex vitreoretinal surgery and anaesthesia. Set up the first neonatal intensive care centre in India in an eye hospital with dedicated neonatal anesthesiologists and nurses. Helped establish self-sustained Neonatal Ophthalmology units (with own ROP trained Ophthalmologists and equipments) in three major Govt and private neonatal hospitals in Hyderabad, first time in India.***

- ***Operated on hundreds of infants who are referred from across India and beyond. So far over 20,000 premature babies have been treated by the LVPEI Hyderabad Campus ROP team and same is now replicating in other LVPEI centres. Was invited as a special speaker at Hot-topics in ROP at Chicago to explain surgical techniques and nuances in nearly an hour long video 'masterclass'! Prof. Hirose, father of ROP surgery, donated all his ROP instruments to Dr. Jalali as his legacy!***

- ***Has trained over 350 professionals' globally in screening and laser therapy for ROP through her unique and first time in the world one Month of ROP Hands-on fellowship program.***



From top clockwise; Meeting Prof. Tatsuo Hirose (2017) in Boston, learnt open sky ROP surgery and performed first time in India. LVPEI colleagues excited when Prof. Hirose sent all his personal legacy ROP instruments including those designed and initialed by Prof. Charles Schepens himself!

- ***Has conducted seminal basic science and operational research in this field. Conducted first ever ROP surgical hands-on workshop anywhere in the world (ongoing).***

- More than 500 presentations and 165 publications in national and international journals and many book chapters. Was an active partner in the Indian National ROP task force for creating ROP and newborn eye screening national guidelines. Founding member and expert of the Indian ROP society (iROP).

- Has created numerous public interest videos to enhance timely ROP Screening. Her slogan of 'Tees Din Roshni KE" has widespread use and acceptance!

- Last but not the least, has made the program self - sustaining and not dependent on her!

Welcome to

Vitreo Retinal Society - India

29th ANNUAL CONFERENCE OF
VITREO-RETINAL SOCIETY OF INDIA

VRSI NAGPUR 2020

3rd to 6th December 2020

SURABURDI MEADOWS, NAGPUR

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- Symposium by the Egyptian VR Society
- Symposium on Myopia by Experts from the East
- Symposium by the ASRS-VRSI : Complicated Surgical Scenarios
- The Buckle Symposium
- The Trauma Symposium
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- Breakfast with Experts Session
- EurekaZone – Innovations of the Year
- Hyper-Imaging : OC(T)ean's Twelve Session – Twelve OCT Diagnoses/terms You Must Know
- Workshop on EyeSi Surgical Simulator
- Workshop on Heads up 3D Vitrectomy
- Multiple Advanced VR Surgery Sessions
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- Uveitis and Oncology Sessions
- Debates and Duels on Hot Topics
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	Upto 1st Sep. 2020	Upto 15th Nov. 2020	SPOT Registration
VRSI Member	INR 7,000.00	INR 8,000.00	INR 10,000.00
Non Member	INR 8,500.00	INR 9,500.00	INR 11,500.00
Trainee	INR 5,000.00	INR 6,000.00	INR 7,000.00
Spouse	INR 4,000.00	INR 5,000.00	INR 5,000.00
Trade Delegate	INR 5,000.00	INR 7,000.00	INR 8,000.00
International Delegate*	USD 150	USD 200	USD 250

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SPOTLIGHT

Management of Difficult Situations during Retinal Surgery

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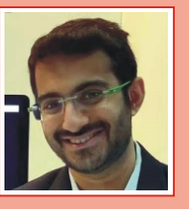

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1. The surgeon forgot to check the position of infusion cannula, leading to a bullous detachment/ bullous detachment with serous choroidal detachment. How do we manage this?

SC: The key to manage this situation is to recognize it early by noticing any abnormal bullous increase in pre-existing RD. The choroidal detachment can drain, either with partial withdrawal of the cannula or separate drainage port can be madedepending on the location of choroidals. This can be done withvalve free trocar cannula or using 20 gauge MVR blade orsmall scleral cutdown. The infusion cannula can be temporarily fixed to any of the superior port, to aid the suprachoroidal drainage. Once the choroidals settle down partly, endo-drainage from the existing break or a small retinotomy can take care of bullous RD.

MN: The first thing to do is, stop the infusion, assess and confirm the status of the cannula. I would remove the infusion cannula from that port and insert it on another port. After confirming its correct position, I would restart infusion to build up the intraocular pressure. At this stage, I would reassess the internal situation.Once the pressure builds up, I would reinsert the infusion to the inferotemporal port. After checking its correct position, we will proceed with the surgery. In case that quadrant seems to have a choroidal detachment etc. then I would choose a new site to insert the cannula which could be inferonasal also and finish the surgery using that. At times, I would use PFCL to displace the subretinal fluid to facilitate the surgery.

SKB: When this kind of situation accidentally happen, one should immediately stop the infusion cannula. Then

ensure that the tip of other two cannulas are intravitreal, then use one of them to maintain the intravitreal pressure and the flatten RD as well as CD. Now remove the original infusion cannula and introduce a new one in that same quadrant (check its tip before starting the infusion) or excising the retina surrounding the infusion cannula to make the infusion cannula intravitreal (less recommended). Then one can proceed with PFCL liquid to settle the bullous RD if PVD induction was already completed or can stain posterior hyaloid phase with triamcinolone particles and to induce PVD before settling RD.

PB: We should stop the surgery. We would close the infusion line and shift the infusion cannula to another sclerotomy. Restart the infusion after checking that the cannula tip is in vitreous cavity. Don't allow hypotony to occur as far as possible. Generally choroidal detachment/ scleral in-folding settles once intra-ocular pressure is built up (very rarely one needs to drain choroidal detachment). Recheck the position of original infusion cannula tip. If it is correctly placed but choroidal /retinal tissue or vitreous is obstructing the cannula, use an MVR blade through other sclerotomy to release the tissue. If the cannula is too posterior or incorrectly placed, remove it and place it at another site. If still the cannula is not seen, we can try using 6 mm cannula instead of 4 mm. Reconnect the infusion line back and open it after confirming that the cannula tip is in vitreous cavity.

GP: We should immediately stop infusion to limit the choroidal/ retinal detachment. Immediately see the infusion cannula tip, if it is subretinal or suprachoroidal. Infusion may need to be pushed in and confirm that it is intravitreal. We should look around to see the extent of choroidal/ retinal detachment. Our idea is to set up another infusion cannula elsewhere in an area without choroidal/ retinal detachment.We should plan to make the tract more vertical than oblique and make sure the new cannula stays intravitreal. We may need to pressurize the globe with a separate intravitreal injection of fluid before the second infusion is set up. Once the second infusion is set up and working, the first infusion can be removed. If because of some reason, we are not able to change the infusion and wants to continue with the original infusion, one may need to make a retinotomy near the infusion tip and push it to bring it into the intravitreal location. Another location is important, if we continue the infusion in the same location, it may again cause increase of suprachoroidal/ subretinal fluid. Use of PFCL heavy liquid to remove fluid in the periphery and laser/ cryo of the periphery can be done. Alternatively, if it is bullous retinal detachment, a posterior retinotomy and air fluid exchange can be done. Usually I don't place a buckle encircling element at this stage but do wide area of laser in the detached area. Choroidal detachment may subside with higher IOP. If it is a small choroidal detachment, it will settle in 1-2 days post operatively. If massive choroidal effusion, we may consider intraoperative drainage of choroidals.

Key learning points:

We should stop the surgery and reassess the situation. If possible, we should change the infusion canula to a quadrant, where it will be visible. Use of an MVR blade or cutter to remove the tissue blocking the entry of the cannula in the vitreous cavity can be done, but is not recommended especially in phakic eyes. PFCL may also be used to flatten the tissues

2. A bullous phakic RD, vitreous followed by retina are coming in to my valved scleral ports, risking iatrogenic break near port. What to do?

SC: I would stop infusion first, analyse the situation. First option is softening the eye with a little vitreous gel removal with the cutter from a port devoid of the issue. Then PFCL is injected to stabilize posterior pole and carry on with the vitrectomy. Apart from that, I may consider an external drainage and simultaneous injection of BSS. Once the retina goes back, we can continue surgery with stabilization of the posterior pole with PFCL.Though I must add this situation is rather rare today with valved cannulas as compared to the 20 gauge days.

MN: First step would be to stop the active infusion. We may inject aviscoelastic to passively push the prolapsed tissue back through the valves. Then we would gently insert the light pipe and get a view of the fundus and gradually inject some perfluorocarbon liquid to flatten the retina and create space, which would also ensure that the prolapse of any tissue from the valves is prevented.

SKB: When this kind of situation happen, one should decrease the IOP (<10 mmHg) to decrease the tendency of vitreous (&retina) to come out. If PVD has been induced, use heavy fluid (PFCL) to flatten the posterior pole and even mid periphery. This will indirectly decrease the tendency of vitreous and retinal incarceration at the port cannulas. If PVD has not been induced, one should use the left handed light pipe as a vitreous swipe to remove the vitreous from the right handed cutter cannula and the carefully cut the vitreous fibrils with the same cutter. Then one should proceed for PVD induction.

PB: We should reduce the intraocular pressure. We should ensure that if valve mechanism is working, else do not hesitate to plug the sclerotomy. Use the cutter through opposite sclerotomy to tap the retina and vitreous away from the sclerotomy. Thoroughly clear anterior vitreous at the base, around the cannula and the incarcerated vitreous within the cannula. Use scleral depression, if needed. If the retina is already incarcerated in the port,

use forceps through opposite sclerotomy to pull the retina (and vitreous) back in the vitreous cavity followed by trimming the anterior vitreous in and around the cannula (however, this eventually will cause retinal break). If the vitreous is sucked into the microvit, before removing the cutter out of the vitreous cavity, we should release foot switch completely (no suction), ask the assistant to pinch the cutter tubing (suction line) and milk it towards the cutter to release the vacuum and then come out of the eye. We can also use the reflux mode to release the retina /vitreous sucked in the port

GP: One important consideration is to reduce the IOP. Heavy PFCL liquid can be used after core vitrectomy to stabilize the posterior pole and keeping it back, immobile without flapping. Once central core vitreous is removed with triamcinolone staining, move to the periphery, especially near the port site, use the shave mode with high cut rate and low suction to create VR separation and remove the vitreous. We can use an assistant's help to indent the retinal periphery, while performing vitrectomy near the ports and periphery will help stabilize the retina without mobility. Once vitreous is removed from the retinal periphery and the ports, apply more PFCL and look for any vitreous retinal incarceration into the port. An IVTA stain can show local vitreous anatomy.

Key learning points:

Stop the surgery. Lower the IOP. Inject PFCL to stabilize the posterior pole and peripheral retina, if PVD is present. Viscoelastic through the same port can be used to push the tissue. Forceps or cutter from the opposite sclerotomy can be used to reposit any prolapsed tissue.

3. RD with PVR D, did everything, RD not settling, what more can I do before resort to retinectomies?

SC: Once everything has been done(excellent base excision, meticulous removal of all membranes), I would look into the cause, which would be most commonly be shortening of inferior retina. I, many times do a smoothening massage of the shortened area, put 180 degrees inferior buckle of good height like a 276 or 360 4mm band as per choice. Retinectomy comes only after these manoeuvres fail.

MN: Normally, I would have planned an encircling buckle along for such a case. In case, I have not done it at the beginning I might want to add it at this stage to avoid or reduce the size of an impending retinectomy. I would make sure that all epiretinal and subretinal membranes are removed. I would use a dye to stain and help locate some membranes as well. After this if I realise that the retina itself is contracted, I would go ahead with a retinectomy based on the situation.

SKB:I want to judge the mobility of detached retina under BSS only. Then assess PVR component - anterior / posterior sub retinal band/ membrane or intrinsic shortening. Subretinal bands are usually visible. But to visualise the invisible anterior starfolds/ immature membrane, it is always better to stain with triamcinolone particles or Trypan blue dye. After removal of stained preretinal membranes, I prefer PFCL heavy fluid to settle the posterior pole upto the posterior margin of the break or beyond them, if no anterior traction is present. In presence of inferior traction, I will then prefer retinectomy, judging the area/ quadrant of retinal contraction.

PB: If there are residual preretinal membranes, those have to be meticulously removed. Translucent thin membranes are not easy to identify. Altered retinal blood vessel reflex/course may be indicative of overlying membrane. We maytry staining, if necessary. Can use PFCL to stretch and immobilize the posterior retina. Membranes could be better identified over stretched retina under PFCL. These membranes can then be removed to the maximum extent possible. If there is anterior proliferation, try meticulous dissection of all anterior membranes. Look for bridging membranes between vitreous base and the retina. If the lens or IOL is causing any hindrance, one might need to remove it. Localized or large circumferential retinotomy may be needed to remove subretinal membranes, if present. Gentle massaging of the retina may also help to reduce the intrinsic contraction. We can try repeated, controlled partial fluid air exchange to stretch the retina (act as a massage). Segmental buckle or 360 degree encirclage may help to flatten the retina. Buckle can be placed before attempting fluid air exchange without doing retinotomy/retinectomy.

GP: Remove as much of vitreous as possible. PVD would be usually near complete by this time. We can stainthe retina with trypan blue, which will stain the membranes blue. We start dissecting the membranes as much as possible. One can do small retinotomies near the apex of membranes if they are very adherent. Use brilliant blue green, it will cause negative staining of the membranes, surrounding ILM will be stained. We can start removing the ILM around the membranes to gain access under the membranes. PFCL can be used to gauge traction to decide, which are the areas where membrane dissection is needed. If it is peripheral shortening of retina, using a 360-degree encircling element/ buckle may be considered. If after all these, the retina fails to fall back without traction, consider doing retinectomies. The site of retinectomies should be planned after judging traction under air or PFCL. Do not use air at high pressure or more quantity of PFCL to judge, it may slip subretinally. Retinectomy is plannedas much peripherally as possible, do liberal retinectomy to relieve traction completely.

Key learning points:

We should peel all membranes meticulously. Use dyes (IVTA/Trypan Blue) to identify them better. We can apply an encircling band. Look for retinal shortening especially inferiorly. Retinectomy should be the last resort.

4. Infusion Air went subretinal during air-fluid exchange. How do we take care of it especially if it is superior?

SC: We need to check for shortening of retina. We should turn back to fluid and use PFCL. Air will come out if there is a superior break. We should try and displace it by PFCL and eye rotation to a break in horizontal meridian. Finally, if there is major superior retina shortening a retinectomy or a buckle with a drainage retinotomy will be the natural choice.

MN: Air would go subretinally only if there is residual traction or contraction in the retina. One has to make an assessment of that. I would gradually switch the infusion back to fluid and then inject perfluorocarbon till the edge of the existing break to assess the flattening and check for any residual traction. Usually the subretinal air would come out with this procedure itself. But in case it has moved to an area away from the break I would choose to make a small retinectomy over it and drain it. After this one has to relieve the traction and then do air fluid exchange again to proceed with the surgery.

SKB: We mustensure that the tip of the infusion port is intravitreal to prevent direct access of air bubble to the sub retinal space. Even if air went subretinally, that means some kind of residual traction is present around the break or anterior retina, which need further trimming the margin of the break or retinectomy, so that complete removal of all kind of tractional elements will be possible. In this kind of situation, I always prefer to stabilise the posterior pole of retina with PFCL fluid.

PB: If small amount of air is in subretinal space but traction is adequately released, the air bubble can be ignored, it will eventually get absorbed. If there is persistent contraction and retina is stiff, we must restart the fluid infusion and remove the air from vitreous cavity. There is a possibility that subretinal air may also come out. If the break is in close proximity to sclerotomy, one can use extrusion needle (passing through the retinal break and directed towards the bubble) to egress out subretinal air. If the air bubble is large and could not be expelled out, superior retinotomy (Small or large) will be needed to remove the air. Occasionally PFCL can be used to fill vitreous cavity to push the subretinal air bubble anteriorly directing towards the existing break to expel it out.

GP: First step is to assess how much air is in the subretinal space and finding out and gauging the areas of traction that has to be removed before further air fluid exchange. We can try removing the subretinal air with active suction under fluid and see if it is coming after traction is relieved. After this also if subretinal air is not coming out, we may have to do a peripheral retinectomy and use PFCL to milk out air. The site of retinectomy should be planned after judging traction under air or PFCL. Once retinectomy site is planned, as much peripherally as possible, do liberal retinectomy to relive traction completely. Use PFCL to flush out the air into the vitreous.

Key learning points:

First, we look for any residual traction and clear it. We can use PFCL judiciously to flatten out the retina and milk out the air. We may consider retinectomy for direct removal of air.

5. Infusion Air has come into the anterior chamber while performing fluid air exchange in a pseudophakic eye or a phakic eye. What do I do?

SC: I would lower air pressure, use a good viscoelastic and close the air for the time being then strike a balance and complete my procedure under low pressure air infusion.

MN: Sometimes, I just realise that air has come into the AC and I just continue with the surgery in case I can manage to view the fundus. The fundus view does become poor but at time one can get a workable view. But in case, it disturbs my view enough to interfere with my surgery. Then, I go ahead and inject viscoelastic into the anterior chamber, which ejects the air out, and one can proceed with the surgery with a good view. One must however remember to remove this viscoelastic, before the end of surgery.

SKB: If an air bubble comes into the anterior chamber during fluid air exchange, that means the infusion cannula is not perpendicularly fixed over the sclera and its tip is tipping out through the iris (most of the times, it lies in an inclined manner). So make the infusion cannula exactly perpendicular to sclera, and fix a paper tape to the tubings to maintain its position, so that no further air bubbles should come in AC. Existing air bubble can be removed by an aspirating needle if small or can be replaced by viscoelastic if large in size.

PB: We must check the direction of infusion cannula tip and correct it, if needed. If air bubble is small, enters in AC almost at the end of surgery and there is no further posterior segment manipulation is needed, it can be left behind. It will get absorbed during early postoperative period. Large air bubble can be removed from anterior chamber by replacing it with visco-elastics. Visco-elastic substance can be injected in AC through side port , simultaneously allowing the air to escape either through

the same port or another port 180 degree apart. Visco-elastic will prevent further entry of air from vitreous cavity to anterior chamber. Additionally, pupil can be constricted before removing air bubble from AC.

GP: We can inject BSS/ Visco to remove the air. Usually viscoelastic is needed as BSS will not prevent further air into the AC. With viscoelastic inside the AC, we can finish the surgery and then remove the viscoelastic with BSS at the end of procedure. In phakic patients generally, and in pseudophakic patients with shallow anterior chambers, it is a better idea to remove the air with BSS at the end to prevent post-operative pupillary block. Antiglaucoma medications post operatively can help prevent IOP rise. Generally, there is no need for an inferior PI, but in case there is gas in AC and we do not expect it to absorb in the first few days, it is better to do an inferior PI on table or post operatively after judging the AC on the first day.

Key learning points:

We must ensure appropriate direction of the infusion cannula. We may ignore the air bubble if view is not being compromised. Use viscoelastic in the anterior chamber to expel it and continue the surgery, if the air is becoming a hindrance.

6. Silicon oil coming into anterior chamber in a pseudophakic patient at the time of Air-SO exchanges. What do I do?

SC: We can use viscoelastic and lower the IOP after removing some oil both from AC and thepars plana. I would retain a small bubble of air behind the IOL and a suboptimal fill with the eyeball straight. Replace viscoelastic with air in anterior chamber. Strict postoperative face down positioning for atleast a week.

MN: As soon as I realise oil globule has come into AC, I stop actively injecting further oil to assess the situation. If it's a very small globule I try to inject air in the anterior chamber and at times that can displace the oil back posteriorly. But if that does not work or the globule is large, I inject viscoelastic and replace the oilwith it in the anterior chamber. Once the oil has gone back, I try to replace the visco with air inject partly or fully and leave whatever visco is there, post operatively and give Diamox prophylactically to reduce the chances of IOP rise. One must also keep a watch on the post-operative reaction in AC due to the viscoelastic and usually it would clear off in a few days.

SKB: Appearance of silicone oil into AC means, there is overfilling of silicone oil, as well as, there is existing rent in posterior capsule or zonular dehiscence. One should stop injecting further silicone oil, replace the anterior chamber silicone oil with viscoelastic, so that AC forms adequately and remove residual air bubbles from the vitreous cavity. We, then judge IOP and, if necessary, can further inject / remove silicone oil.

PB: We should check the direction of cannula tip and correct if needed. If there is overfill (eye is hard), suck out some oil through the sclerotomy. If the oil bubble is very small and there is no further posterior segment manipulation needed.It can be left behind to be removed during planned silicone oil removal.

When the oil bubble is trapped between IOL anterior surface and iris and popping gradually through pupil, visco-elastics can be injected in AC, through side port to push the oil back. When there is large bubble filling anterior chamber, two limbal stab incisions can be made 180 degrees apart. A visco-elastics (Avoid Sodium hyaluronate, as it would be left behind in post op phase) can be injected in anterior chamber through one port to push the oil towards other port. Use iris spatula or any other instrument to keep the second port open to allow oil to egress out of. Constrict the pupil at the end of surgery. It is preferred to leave visco-elastic in anterior chamber at the end. Any attempt of removal can lead to more oil entering in the AC. Adding anti glaucoma medications for 3-5 days and close monitoring of IOP is needed in early post-operative period.

GP: In a large PC rent / absent PC, where SO has come into the AC, partial removal of SO will take the bubble back. After that we can very slowly and carefully under visualization, complete the SO fill without spilling it into the AC. Sometimes in such a case, air injection into the AC can tap the SO behind. We can let the air remain in the AC during the first few days. If a small PC rent or zonular defect is the reason for SO in AC, one may have to remove the SO from the AC by using viscoelastic through the limbus. Retain the viscoelastic till SO is fully filled up to the brim in the vitreous and then remove viscoelastic with BSS. If the tamponade requiring tear is superior, then we can have slight underfill of oil after this procedure, so that postoperatively oil does not come into the AC. But if the tear is inferior, then we may not be able to underfill the oil and hence may need visco elastic retained in the AC for the first few days. Take care of AC reaction and high IOP in immediate post op period.

Key learning points:

We can use air/Viscoelastic to push back the oil. Small bubble can be left alone, as this can be removed at the time of planned silicon oil removal.

RETINA TECH - PROF NAMPERUMALSAMY YR AWARD

Retinal Imaging in 2020 : Application of Imaging in Day-to-Day Practice

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Post Graduate institute of medical education and research (PGIMER)
Chandigarh
India

At the outset, I would like to express my heartfelt gratitude to the Vitreoretina Society of India (VRSI), Dr. Shobhit Chawla, Dr. Raja Narayanan, Dr. Anand Rajendran and the members of VRSI governing council/award committee for bestowing this prestigious honor on me. Prof. Namperumalsamy, Chairman Emeritus of Aravind Eye Hospital has been an international pillar of ophthalmology and one of the 100 most influential individuals in the world. To win this award is a very special honor and makes me feel very humbled. I cannot thank my mentors in retina enough – Prof. Amod Gupta, Prof. Vishali Gupta, Prof. Quan Dong Nguyen, who have been my guiding force. I would also like to sincerely thank my parents, and better half, Kanika Aggarwal, an excellent vitreoretinal surgeon, and my little princess Aadya for their unconditional love. The first recipient of this Award was much-deserving Dr. Jay Chhablani, who has been my guide and a valuable research partner.

In 2020, the research in retinal imaging focuses on two broad aspects: differentiating and diagnosing, and quantification. What interests me is how can OCT and OCT angiography help us get answers in our clinics in 2020. Consider a case of a 22-year-male with acute painless decreased vision in both eyes for past 1 week. He also had tingling sensation in lower limbs, slippage of slippers, inability to perceive pain, and temperature. Further, he was diagnosed with X-linked Chronic granulomatous disease (CGD) (CYBB gene mutation) with recurrent liver abscess (requiring multiple admissions, IV antibiotics and Pigtail catheter drainage). The patient was kept on long-term antibiotic prophylaxis comprising of itraconazole (200 mg/day) and sulfamethoxazole / trimethoprim (400 + 80 mg/day) for the past 6 years. The patient presented with a yellow pre-retinal lesion in the left eye and bilateral optic disc edema (Figure 1). OCT clearly shows pre-retinal location of the lesion, but a more careful analysis shows microcystic retinal edema. It is extremely important to detect these subtle changes, as in this case, this particular finding led to the diagnosis of linezolid induced optic neuropathy due to prolonged use of the antibiotic.

In 2017, North India including Chandigarh was reeling under an epidemic of dengue fever with several thousands of cases reported by the National database. During this time, we examined over 50 cases with a unique constellation of findings - vitreous cells that were not seen clinically but only on OCT as hyper-reflective dots, hyper-reflective lesions at the outer plexiform and outer nuclear layers with cystoid spaces, and disruption of foveal contour with hyper-reflective lesion involving all retinal layers at the fovea in the left eye. We realized that these OCT features indicated dengue maculopathy, and determined that these alterations combined with the evidence of ischemia on OCTA were caused by a combination of inflammation and ischemia (Figure 2 and 3). This is a very important observation which we termed as Dengue-induced Ischemic Inflammatory Foveolitis and Outer Maculopathy (DIII-FOM), and for the first time this justified the use of corticosteroid therapy for these patients. OCT can be an invaluable tool in differentiating between various complex entities. In 2018, we aimed at comparing OCT features of active necrotizing infectious retinitis due to toxoplasmosis or viral-related disease and to find distinctive tomographic signs of these two entities. We concluded that toxoplasmosis has a number of tell-tale features which can be easily used to differentiate it from viral retinitis. These features included clots of cells along posterior hyaloid, retro-hyaloid hyper-reflective spots, hyper-reflective oval deposits on the retina and stalagmite-like mirror deposits on the posterior hyaloid, and disruption of the choroidal architecture (Figure 4). These findings are not observed in viral retinitis. My

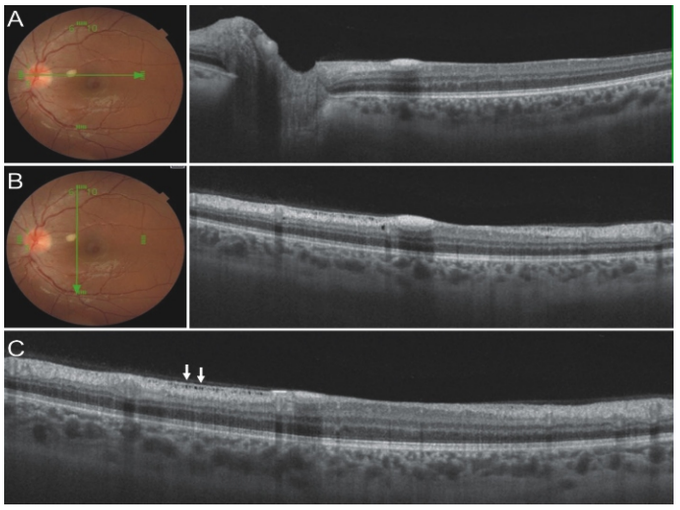

Figure 1: Figure shows pre-retinal yellow deposits, disc edema and microcystic edema in a subject with linezolid toxicity. (Retin Cases Brief Rep. 2018 Jul 25. [Epub ahead of Print])

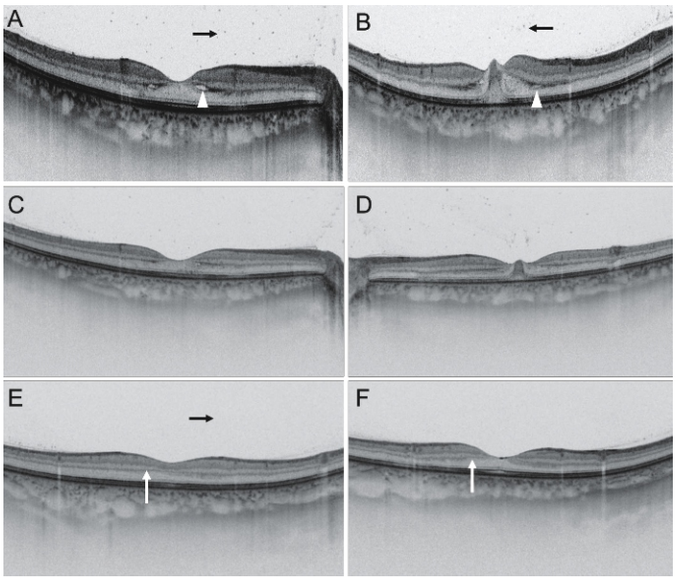

Figure 3: Serial OCT of a subject with dengue shows outer maculopathy and outer retinal changes with cystic changes. (Agarwal A et al. Ophthalmology Retina 2018;3(2):170-177)

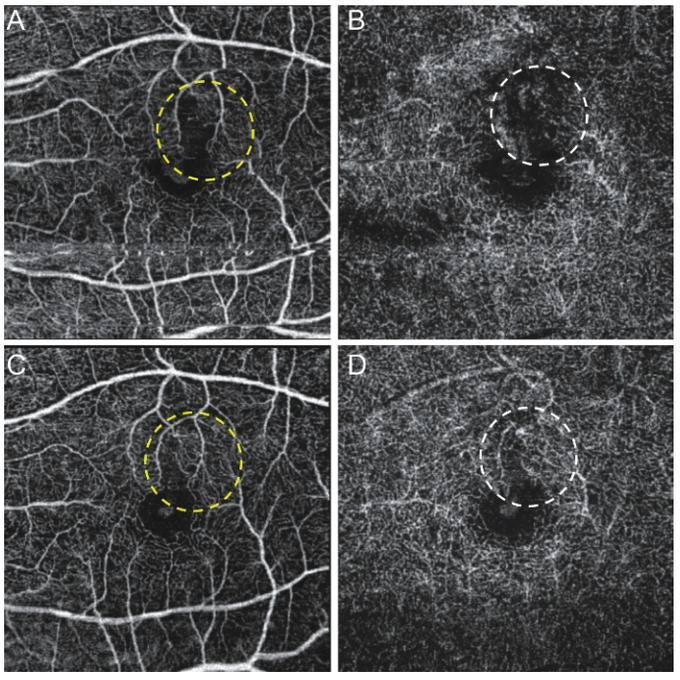

Figure-2: OCTA of a subject with dengue shows ischemic maculopathy. (Agarwal A et al. Ophthalmology Retina 2018;3(2): 170-177)

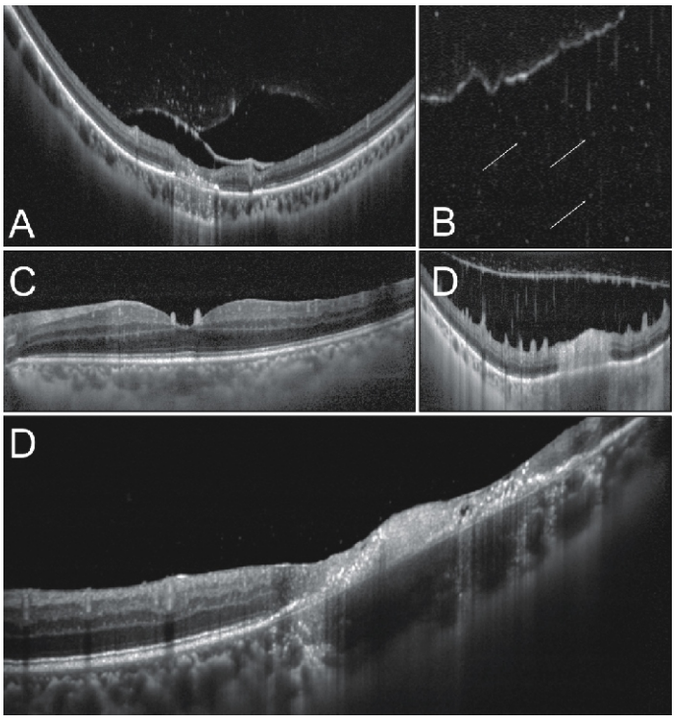

Figure 4: OCT features of toxoplasmosis are seen in the figure. (Agarwal A et al. BJO 2018; 2018 Apr;102(4):433-437)

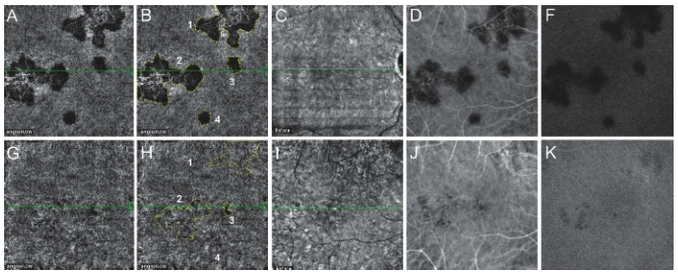

Figure 5: OCTA shows quantitative measurements of choroiditis lesions in serpiginous-like choroiditis due to tuberculosis. (AgarwalA et al. Retina. 2020 [In press])

close friend and collaborator/co-author, Alessandro Invernizzi from Milan, Italy, observed that OCT can be therefore, used as a quick tool in our clinics to identify such patients and treat them promptly.

One of the important aspects of doing meaningful research is opening your doors to ideas and collaborations, and joining hands with fellow colleagues from around the world. With the idea of opening our group to build partnerships, we established the OCTA study group in 2015, the Collaborative Ocular Tuberculosis Study Group in 2016 led by my mentor, Prof. Vishali Gupta, and the PGI Ocular Lymphoma Study Group in 2019. Together the three groups have published over 25 clinically relevant manuscripts. Quantification of retinal and choroidal pathology is a valuable tool in the clinic. However, it is important that we are able to use quantification for early detection and/or therapeutic decision-making. In 2016, we had published a study that determined the role of OCTA in ocular tuberculosis, particularly serpiginous-like choroiditis.

In 2020, we have realized that OCTA can be used as an endpoint in the treatment of serpiginous-like choroiditis. We learnt that the healing of the choroiditis lesions is accompanied by reduction in choriocapillaris flow deficit area and lesions less than 0.1mm2 tend to resolve with minimal flow voids and atrophy of choriocapillaris (Figure 5). OCTA can also be used in various systemic diseases such as HIV, where diagnosis of microangiopathy is relevant since presence of vasculopathy has been associated with lower CD4+ counts and higher HIV plasma viral load. The features of HIV microangiopathy may be subtle and are likely to be missed on routine clinical examination or conventional dye-based fluorescein angiography. OCTA provides accurate quantitative measurements suggesting reduction in flow densities in subjects with HIV. Presently, our group is focusing on other conditions such as pancreatitis, schizophrenia, obesity and sleep apnea. We also applied OCTA to study subjects with rhegmatogenous retinal detachments. Patients with macula-off rhegmatogenous detachmentsmay have suboptimal visual recovery despite successful reattachment due to various reasons such as loss of photoreceptors. However, microvascular changes in the macula following reattachment have not been adequately studied. Using OCTA, we evaluated the retinal microvasculature in subjects who underwent surgery for rhegmatogenous detachments and realized that these subjects have reduction in flow densities.

In summary, retinal imaging is simple, extremely useful and widely applicable. Collaborative efforts are needed to be able to realize the full potential of technology that is currently available. Ultimately, our research must benefit our clinical practice, and help colleagues manage their patients. I once again thank VRSI for this big honor.

INNOVATOR'S ISLE - INNOVATION OF THE YEAR AWARD

Glue Assisted Retinopexy for Rhegmatogenous Retinal Detachments (GuARD): A Novel Surgical Technique for Closing Retinal Breaks

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INTRODUCTION:

The commonly used modalities for management of rhegmatogenousretinal detachments (RD)are scleral buckling (SB), pars plana vitrectomy (PPV), pneumatic retinopexyor a combination of the above techniques. Recent studies reported a primary retinal reattachment rate of more than 90% in uncomplicated RD with both SB and PPV.[1] The "scleral buckling versus primary vitrectomy in rhegmatogenous retinal detachment (SPR) study"showedthat PPV had higher anatomical success rates in pseudophakiceyeswhereasSB had better visual improvement rates in phakic eyes.[2] There has been an increase in the popularity of PPV for management of RD in recent years owing totechnical advancements in small gauge instrumentations and newer and better wide angled imaging systems.

The PPV approach for rhegmatogenousRD repair, however, suffers from a few inherent disadvantages which stem from the necessity for endo-tamponade with either silicone oil or long-acting gasses. Most importantly, silicone oil and gas tamponade are also associated with complications like secondary glaucoma.[3] The Silicone Study showed that chronic postoperative elevated intraocular pressure (IOP) was seen in both thegas and silicone oil groups.[4]While removal of silicone oil is associated with an increased risk of redetachment, chronic retention leads to emulsification, increased rate of cataract formation and corneal changes.[4] Moreover, retinal support with both forms of tamponadeis usually insufficient incases with inferior retinal breaks, even with strict postoperative positioning. Proper positioning itself is challenging in the elderly and in patients with spinal disorders and gas tamponades can also lead to restriction in air travel.

And therefore there is a need to overcome the problems posed by conventional tamponade

In this study the authors hypothesized that retinal tamponade with long-acting gases or silicone oil and their associated limitations could be circumvented by a temporary tamponading agent localized to the area of the retinal break. Fibrin glue emerged as the likely candidate since its efficacy and safety as an ocular tissue sealant had been established not only inocular surface procedures but also in scleral fixation of intra-ocular lenses and even in surgeries for optic disc pit associated macular detachments.[5],[6]This study describes the clinical results of a novel surgical technique of fibrin glue assisted retinopexy for rhegmatogenous retinal detachment (GuARD) that obviates the need for oil or gas tamponade after PPV.

METHODS:

Fibrin glue assisted Pars Plana Vitrectomy was done in cases of simple, uncomplicated retinal detachments. However a) children b) cases with: any previous retinal surgery, giant retinal tears, proliferative vitreo-retinopathy (PVR) grade C or more, associated vitreous hemorrhage, associated choroidal detachment, associated with multiple retinal breaks and macular holes were excluded before selecting patients for this novel procedure:

Surgical technique:

All the surgeries were performed under local anesthesia by a single surgeon (MT) with avitrectomy system(Constellation, Alcon Laboratories Inc., Fort Worth, TX, USA) and a noncontact wide viewing system (Resight 700, Carl Zeiss Meditec AG, Jena, Germany). A standard 25-gauge PPV was done in all cases, followed by fluidair exchange and subretinal fluid was removed to reattach the retina using a flute needle. The retinal breaks were treated with laser photo coagulation. Using a 1mL syringe 0.1 to 0.2mL of fibrin glue (TISSEEL Kit, Baxter AG, Vienna, Austria)was then slowly injected over the retinal breaks (Figure1). After waiting for 5 minutes, to allow the glue to form a thick fibrin clot which covered the retinal break, the air was

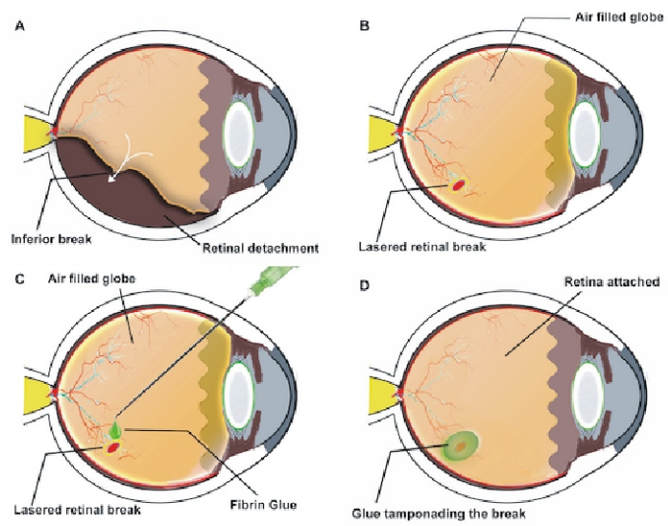

Figure 1: Schematic representation of the surgical technique of Glue Assisted Retinopexy for Rhegmatogenous Retinal Detachments (GuARD). (A) Representative depiction of inferior retinal detachment with inferior break. (B) After pars-plana vitrectomy and fluid-air exchange the sub-retinal fluid is drained internally using a flute needle;the retina is settled, and the break is subsequently lasered. (C) In an air-filled eye, 0.1 to 0.2mL of fibrin glue is injected and applied over the break. (D) Subsequently at the end of the surgery, air is replaced by balanced salt solution and the retina is left attached with a clot of fibrin covering the break.

removed from the globe and exchanged with balanced salt solution Neither was air, long-standing gas or silicone oil tamponade used nor were patients instructed to observe any specific postoperative head positioning.

Follow-up and Documentation:

All patients were examined postoperatively at 1-day, 1-week, 2-weeks and 1-month postoperatively. The postoperative evaluations included measurement of the best-corrected visual acuity (BCVA) and intraocular pressure (IOP) and fundus photography at all visits. An optical coherence tomography (OCT) evaluation was done at 1 month and then at all subsequent visits. Besides this electroretinography (ERG) was done for all patients at 1-month visit.

Typically, a clump of fibrin glue was present overlying the break at 1-day which reduced in size considerably by 1-week and had completely dissolved at 2-weeks (Figure 2).

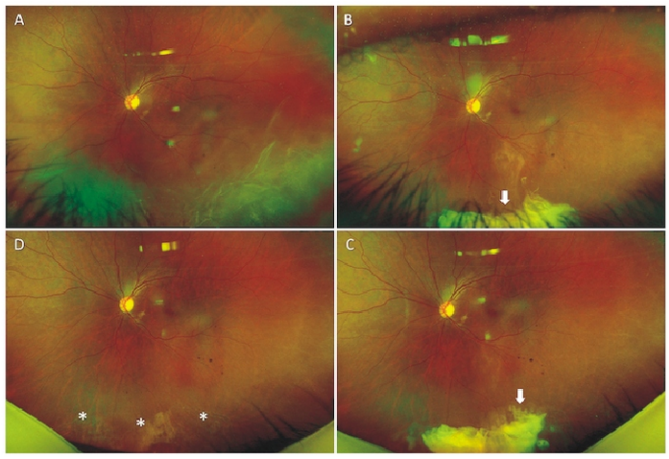

Figure 2: Early clinical course of Glue Assisted Retinopexy for Rhegmatogenous Retinal Detachments (GuARD).(A) Fundus photograph of the left eye of a 36-year old male patient with inferior retinal detachment. (B) Same eye on first post-operative day with attached retina and fibrin clot covering the inferior retinal breaks (white bold arrow); (C) At one-week, the inferior fibrin clot over the breaks is still visible but has decreased in size; (D) At two-weeks the fibrin clot has completely disappeared and the lasered inferior breaks are now visible (white asterisks). The visual acuity improved from 20/100, preoperatively to 20/80 at 6 months.

Complications:

No eye had any increase in post operative inflammation. None of the eyes had an elevation of intraocular pressure at any of the visits. Two cases showed cystoid macular changes on OCT at 1-month visit which was treated with topical Nepafenac eyedrops and showed resolution by 2-month visit. Electroretinography was done for all eyes at 1 month visit and there was no significant increase in implicit times, "a" and "b" wave amplitudes, or b/a ratios.

DISCUSSION

Glue assisted Retinopexy for Rhegmatogenous Retinal

Detachments as a surgical technique utilises fibrin glue as a local tamponading agent after PPV in RD surgery. The initial results of this study indicate that air, long-acting gas and silicone oil tamponade may be avoidable with the use of the novel GuARDtechnique. This approach will be advantageous in many ways, including but not restricted to early visual recovery, no risk of secondary glaucoma or corneal endothelial damage and obviation of postoperative head positioning. The American Society of Retina Specialists (ASRS) 2015 Global Trends in Retina survey revealed that 63-87% of the respondents preferred PPV for treating pseudophakicsuperior as well as inferior RD.[7] Thus, for the majority of vitreo-retinal surgeons who prefer PPV to SB, GuARD can evolve as an useful alternative to gas or silicone oil tamponade.

In RD surgeries, tamponade agents are used to provide surface tension across retinal breaksin order to prevents further fluid flow into the subretinal space until the effect of retinopexy (photocoagulation or cryopexy) becomes permanent.[1]It has also been shown that adhesion strength of almost 95% is achieved at 18 hours after laser photocoagulation and the maximum strength is reached on day 5 (approximately 230% of normal).[8]As shown in this pilot-study and in previous studies using fibrin glue for optic disc pits, the glue appears to stay in place for 1-2 weeks . Therefore, it appears reasonable to assume that a fibrin plug can safely and adequately cover the bare retinal breaks until the retinopexy effect became permanent. Haruta et al had earlier tried using Seprafilm Adhesion Barrier (Sanofi, Bridgewater, NJ, USA), a bioresorbable translucent membrane comprising sodium hyaluronate and carboxymethylcellulose to patch retinal breaks.[9] However it was difficult to ensure a safe and effective delivery of the Seprafilm sheet into the eye and the study was limited to retinal tears that could be covered with 5 × 2 mm sheets of Seprafilm. Since fibrin glue is injected in liquid from and gels as the two components interact, size of the retinal break or its location are not limiting factors. Fibrin glue has been described earlier in the management of optic disc pit-associated macular detachments. None of these studies reported any toxicity of fibrin glue. Like in this current study, fibrin glue was also not found to have any toxic effects on retinal function or structure in a rabbit model.[6]

Unlike anterior segment surgeons, fibrin glue is not commonly used by vitreo-retinal specialists. Therefore, it may be useful to highlight some of the technical aspects of using fibrin glue, particularly in the context of intra-ocular retinal application. It's best to avoid the DUPLOJECT injectoras the glue tends to gel within the 25-g needle and block it. Ideally one should prepare the two components (sealer protein and thrombin solutions) of the glue separately in 1mL insulin syringes. The thrombin solution is less viscous and tends to squirt leading to spillage, which can cause a larger clot than required. This can be avoided by first making the needle fluid free and discarding a small amount externally before introducing the needle through the vitrectomy port. Otherwise, the excessive clot can be trimmed with the vitrectomy cutter. It's also advisable to apply the more viscous sealer protein solution first and then applying the thrombin solution as it tends to gel as soon as there is contact and there is no excessive spillage beyond the area of the retinal break.

Conclusion

Fibrin glue as a tamponading agent can be successfully used for treatment of early retinal detachments with single breaks or breaks limited to one quadrant. This technique avoids the pitfalls of gas or oil tamponades and obviates the need of postoperative head positioning.

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PROVEN RELIABILITY IN REAL LIFE SETTINGS[10-15]

Real life evidence comparable to clinical trials[10-15]

INNOVATIVE MODE OF ACTION[16-22]

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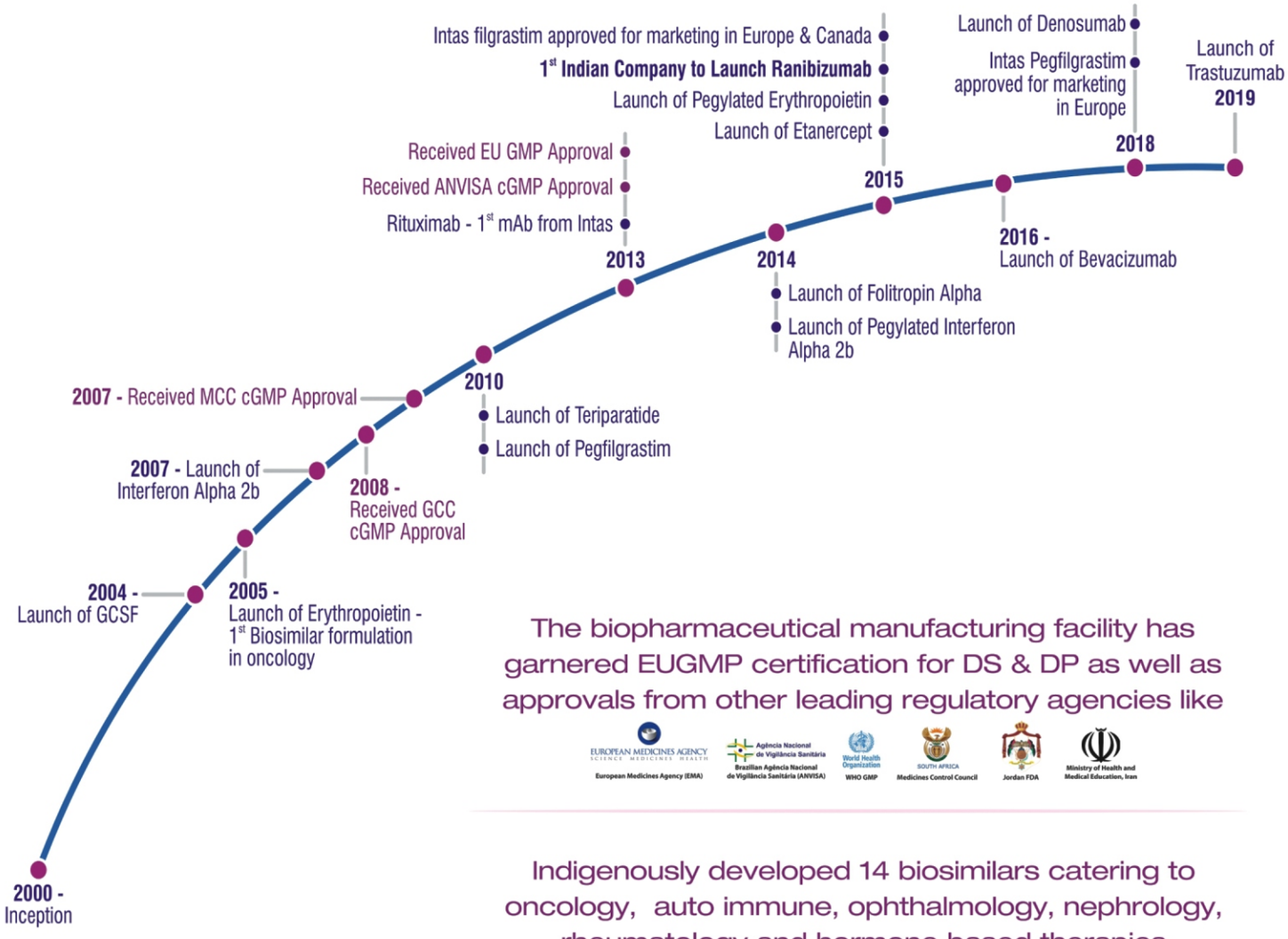

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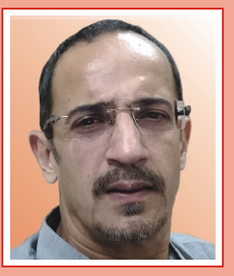

1. Vitrectomy with inverted internal limiting membrane flap versus internal limiting membrane peeling for macular hole retinal detachment in high myopia: a systematic review of literature and meta-analysis.

Xu Q, Luan J.Eye (Lond). 2019 May 9. doi: 10.1038/s41433-019-0458-3

ABSTRACT

PURPOSE :

To evaluate the effect of vitrectomy with inverted internal limiting membrane (ILM) flap for the treatment of macular hole retinal detachment (MHRD) in high myopia compared with that of ILM peeling.

METHODS :

PubMed, EMBASE, Web of Science, MEDLINE, Ovid, Wan Fang and CNKI were systematically reviewed. The primary outcome parameters were the MH closure rate, retinal reattachment rate and postoperative BCVA. Secondary outcome parameters, included intraoperative or postoperative complications.

RESULTS :

Seven retrospective comparative studies including 228 eyes were selected. No significant difference was detected in either postoperative BCVA (MD -0.07; 95% CI: -0.17 to 0.03; p = 0.16) or the improvement in postoperative BCVA (MD -0.17; 95% CI: -0.50 to 0.16; p = 0.32) between the ILM flap group and ILM peeling group. The retinal reattachment rate using inverted ILM flap was not significantly different from that using ILM peeling (odds ratio (OR) 2.24; 95% CI: 0.75-6.73; p = 0.15). The MH closure rate was higher with inverted ILM flap than with ILM peeling (OR 11.86; 95% CI: 5.65 to 24.92; p < 0.00001). There was no significant difference in intraoperative or postoperative complications, including concomitant cataract rate (OR 1.22; 95% CI: 0.42-3.58; p = 0.71).

CONCLUSION :

The inverted ILM flap technique could contribute to a higher MH closure rate than ILM peeling, but visual improvement was similar. Both surgical methods could obtain a high-retinal reattachment rate with fewer intraoperative and postoperative complications.

One of the best applications of an inverted internal limiting membrane flap for macular hole closure could possibly be an association with high myopia and posterior pole retinal detachment. Xu and Luan meta-analyzed about 350 subjects from 7 large controlled studies and concluded that flap inversion closed the macular holes better; but retinal reattachment and visual recovery were not improved by the flap. The discrepancy between the anatomical and visual outcomes could be attributed to pre-existing myopic degeneration, or the toxic contact of the dye-stained flap with retinal pigment epithelium, either of which could have blunted the visual improvement. A third possibility proposed was that the apparently better hole closure with flap inversion was actually due to the bridging of the flat-open edges of the macular hole with the flap tissue, which actually hindered rather than improved the centripetal migration of hole edges.This reminds us that the primary aim of surgery is not to close the macular hole but to improve vision by doing so.

2. Outcomes of small-gauge vitreoretinal surgery without scleral-depressed shaving of the vitreous base in the era of wide-angle viewing systems.

Tabandeh H, London NJS, Boyer DS, Flynn HW Jr. Br J Ophthalmol. 2019 Dec;103(12):1765-1768.

ABSTRACT

PURPOSE :

To evaluate outcomes of small-gauge pars planavitrectomy (PPV) for the treatment of rhegmatogenous retinal detachment (RD) without scleral-depressed shaving of the vitreous base.

METHODS :

Retrospective, consecutive case series. Surgical technique included small-gauge PPV (25G, 23G, 25G+ or 27G) and wide-angle vitrectomy viewing system in all cases. No cases were excluded based on the level of complexity of RD. Outcome measures were retinal reattachment rates and Snellen visual acuity (best-corrected visual activity [BCVA]).

RESULTS :

312 eyes of 301 patients, mean age 60.8 years, and mean follow-up 23.1 months. Baseline characteristics included macula-off RD in 207 (66%) eyes, psudophakia in 124 (40%) eyes, high myopia in 74 (24%) eyes and giant retinal tear in 14 (5%) eyes. The retina was reattached with one procedure in 296 (95%) eyes. Final retinal reattachment was achieved in 310 (99%) eyes. The BCVA at baseline was >20/40 in 76 (24%) eyes, 20/50-20/100 in 48 (15%) eyes, 20/200-20/400 in 46 (15%) eyes and <20/400 in 142 (46%) eyes. At the last follow-up, the BCVA was >20/40 in 168 (54%) eyes, 20/50-20/100 in 60 (19%) eyes, 20/200-20/400 in 49 (16%) eyes and <20/400 in 35 (11%) eyes. The mean change in logMAR equivalent was -0.12 for the macula-on group and -1.13 for the macula-off group (p<0.0001).

CONCLUSION :

Small-gauge PPV without scleral-depressed vitreous base shaving can be associated with good anatomical and visualoutcomes. Case selection based on the complexity of RD may not be required when considering small-gauge PPV.

This is an interesting and authoritative single-surgeon large case series which reported excellent surgical outcomes in both simple and complex retinal detachments without shaving the vitreous base: a long-accepted surgical wisdom. The study is a bit weakened by the “discretionary” use of a belt buckle for anterior and inferior PVR, the questionable “complexity” of RD in view of baseline characteristics (excluding children & trauma; 34% macula on RD, only 5% GRT); and short follow-up, esp. in silicone oil retained eyes. The need for removal of adherent vitreous from the peripheral breaks, another home truth was not addressed in the study. Yet the authors admirably shake up an established home truth (apparently unproven according to the authors), and offer circumferential barrage laser as a handy alternative for truly impressive 95% single-surgery reattachment rate.

3. Anatomic, Visual, and Financial Outcomes for Traditional and Nontraditional Primary Pneumatic Retinopexy for Retinal Detachment.

Jung JJ, Cheng J, Pan JY, Brinton DA, Hoang QV. Am J Ophthalmol. 2019 Apr;200:187-200.

ABSTRACT

PURPOSE :
To determine factors predictive of anatomic, visual, and financial outcomes after traditional and nontraditional primary pneumatic retinopexy (PR) for rhegmatogenous retinal detachment (RD).

DESIGN :

Retrospective interventional case series and cost comparison.

METHODS :

Participants: Total of 178 eyes (156 patients) with PR-repaired primary RD by a single surgeon at a clinical practice from January 2001 to December 2013 and followed for ≥1 year. The cohort had 2 subgroups: traditional (TPR) and nontraditional (NTPR) PR.

MAIN OUTCOME MEASURES :

Characteristics associated with best-corrected visual acuity (BCVA) and anatomic outcomes. Cost analysis and potential cost savings comparing PR to scleral buckle and vitrectomy.

RESULTS :

One hundred thirty-one of 178 eyes (73.5%) were successfully treated at 1 year (postoperative year 1): 72.8% (75/103) in TPR and 74.6% (56/75) in NTPR. Macula-off detachment (-0.44 logMAR, P < .001) and clock hours of RD (-0.84 logMAR, P < .001) correlated with improved BCVA; pseudophakia (0.26 logMAR, P = .002) and inferior retinal tears (0.62 logMAR, P = .009) correlated with worsening BCVA. Pseudophakia (-0.15, P = .03), inferior quadrant RD (-0.27, P < .001), and proliferative vitreoretinopathy (-0.68, P < .001) correlated with anatomic failure. Total average cost for TPR and NTPR was $1248.37 ± $882.11 and $1471.91 ± $942.84, respectively (P = .10). PR had a potential cost savings of 62% and 60.8% when compared to scleral buckle and vitrectomy, respectively.

CONCLUSIONS :

PR results in successful anatomic and visual outcomes in both TPR and NTPR repair of primary RD. Preoperative pseudophakia is associated with worse visual outcomes and less anatomic success. The cost of primary PR and subsequent procedures to achieve final anatomic success was not significantly different between TPR and NTPR, and supports the possible cost-effectiveness of expanded indications for PR.

The largest single-surgeon case series with minimum 1 year follow-up, this study reaffirms the high success rate (nearly 80%) of pneumatic retinopexy, surprisingly maintained for even unconventional indications like spaced-out breaks, breaks in inferior quadrants and co-existing vitreous hemorrhage. Having a single surgeon ensured consistency in the injection technique, choice and volume of gas (0.6mL SF6) &retinopexy modality (cryo and laser), and follow-up intervention: a major plus over the previous multicenter trials, with inevitable surgical confounders. The procedure cost close to a third of the surgical alternatives, even when accounting for second surgery for pneumoretinopexy failures and did not worsen the final surgical outcomes: apparently a no-downside procedure, especially in a resource-starved setting.

4. Preoperative Bevacizumab for Tractional Retinal Detachment in Proliferative Diabetic Retinopathy: A Prospective Randomized Clinical Trial

Arevalo JF, Lasave AF, Kozak I, Al Rashaed S, Al Kahtan E, Maia M et al for the Pan-American Collaborative Retina Study (PACORES) Group. Am J Ophthalmol. 2019 Nov;207:279-287

ABSTRACT

PURPOSE :

To assess the effectiveness and safety of an intravitreal injection of 1.25 mg bevacizumab (IVB) as a preoperative adjunct to small-gauge pars planavitrectomy (PPV) compared with PPV alone in eyes with tractional retinal detachment secondary to proliferative diabetic retinopathy.

METHODS :

This prospective, double-masked, randomized, multicenter, active-controlled clinical trial enrolled 224 eyes of 224 patients between November 2013 and July 2015. All eyes underwent a baseline examination including best-corrected visual acuity, color photos, optical coherence tomography, and fluorescein angiography. Data were collected on intraoperative bleeding, total surgical time, early (<1 month) postoperative vitreous hemorrhage, and mean change in best-corrected visual acuity at 12 months. $P < .05$ was considered statistically significant.

RESULTS : A total of 214 patients (214 eyes) were randomized in a 1:1 ratio to PPV plus IVB ([study group] 102 eyes) or PPV plus sham ([control] 112 eyes). Iatrogenic retinal breaks were noted intraoperatively in 35 eyes (34.3%) in the study group, and 66 eyes (58.9%) in the control group ($P = .001$). Grade 2 intraoperative bleeding was noted in 32 (31.3%) eyes in the study group and 58 (51.7 %) eyes in the control group ($P = .001$). Endodiathermy was necessary in 28 (27.4 %) eyes in the study group, compared with 75 (66.9%) eyes in the control group ($P = .0001$). Mean surgical time was 71.3 ± 32.1 minutes in the study group and 83.6 ± 38.7 minutes in the control group ($P = .061$).
Conclusion :

Preoperative IVB seems to reduce intraoperative bleeding, improving surgical field visualization, and reducing intraoperative and postoperative complications.

This randomized trial stamps the verdict already given by previous studies and meta-analyses: pre-operative priming with bevacizumab improves the surgical outcomes in complex diabetic vitrectomy (specifically tractional detachments) by reducing intraoperative and postoperative bleeding, iatrogenic break formation, and thereby surgical time. The final visual acuity was however not significantly better in post-injection vitrectomies. Bevacizumab aggravated tractional membranes preoperatively in 3% cases, but it did not worsen the surgical outcomes. The authors didn't mention the presence/absence of scatter photocoagulation marks, which could affect ease of membrane peeling, or the status of macular ischemia, which could explain the lack of better visual outcomes. A previous study which pegged the optimum time for vitrectomy post-Avastin as 7-10 days wasn't quoted by the authors, who insist on about half of that time lag to avoid aggravated vitreous traction.

5. Spectral-Domain OCT Measurements in Alzheimer's Disease: A Systematic Review and Meta-analysis.

Chan VTT, Sun Z, Tang S, Chen LJ, Wong A, Tham CC et al. Ophthalmology. 2019 Apr;126(4):497-510.

ABSTRACT

TOPIC : OCT is a noninvasive tool to measure specific retinal layers in the eye. The relationship of retinal spectral-domain (SD) OCT measurements with Alzheimer's disease (AD) and mild cognitive impairment (MCI) remains unclear. Hence, we conducted a systematic review and meta-analysis to examine the SD OCT measurements in AD and MCI.

CLINICAL RELEVANCE : Current methods of diagnosing early AD are expensive and invasive. Retinal measurements of SD OCT, which are noninvasive, technically simple, and inexpensive, are potential biomarkers of AD.

METHODS : We conducted a literature search in PubMed and ExcerptaMedica Database to identify studies published before

December 31, 2017, that assessed the associations between AD, MCI, and measurements of SD OCT: ganglion cell-inner plexiform layer (GC-IPL), ganglion cell complex (GCC), macular volume, and choroidal thickness, in addition to retinal nerve fiber layer (RNFL) and macular thickness. We used a random-effects model to examine these relationships. We also conducted meta-regression and assessed heterogeneity, publication bias, and study quality.

RESULTS : We identified 30 eligible studies, involving 1257 AD patients, 305 MCI patients, and 1460 controls, all of which were cross-sectional studies. In terms of the macular structure, AD patients showed significant differences in GC-IPL thickness (standardized mean difference [SMD], -0.46; 95% confidence interval [CI], -0.80 to -0.11; I^2 = 71%), GCC thickness (SMD, -0.84; 95% CI, -1.10 to -0.57; I^2 = 0%), macular volume (SMD, -0.58; 95% CI, -1.03 to -0.14; I^2 = 80%), and macular thickness of all inner and outer sectors (SMD range, -0.52 to -0.74; all P < 0.001) when compared with controls. Peripapillary RNFL thickness (SMD, -0.67; 95% CI, -0.95 to -0.38; I^2 = 89%) and choroidal thickness (SMD range, -0.88 to -1.03; all P < 0.001) also were thinner in AD patients.

CONCLUSIONS : Our results confirmed the associations between retinal measurements of SD OCT and AD, highlighting the potential usefulness of SD OCT measurements as biomarkers of AD.

Alzheimer's disease is a global public health challenge where early detection is critical but elusive due to expensive and invasive screening for neurodegenerative biomarkers. In this authoritative meta-analysis and review, inner retinal thinning (esp., peripapillary nerve fiber layer, and macular ganglion & and inner plexiform layers) on SD-OCT correlated well with the early and established Alzheimer's disease across the 30 selected studies. A significant choroidal thinning was also observed in several studies. A major limitation was the cross-sectional nature of the analyzed studies, limiting longitudinal projections. Still, the robustness of the associations posits SD-OCT as a promising biomarker and a readily available tool for screening and early diagnosis of Alzheimer's disease, at least in association with established vascular and CNS markers.

6.An Ophthalmologist's Guide to Deciphering Studies in Artificial Intelligence.
Ting DSW, Lee AY, Wong TY. Ophthalmology 2019 Nov;126(11):1475-1479.

AN EDITORIAL : Since AI is pervading medicine like *SkyNet* (remember movie *Terminator*?) with 550 hits in PubMed on Ophthalmology alone, we need to get primed ("transfer learning") to make sense of it. Three author(-itie-)s guide us on what to look for in an AI-based article, and also explain components of AI, training and testing datasets, reference standard (that is us), machine learning and deep learning techniques, and finally how to adopt the AI for clinical performance, assess its diagnostic performance and limitations. They also highlight the need of a task force to develop consensus and guidelines for AI research in ophthalmology, with real life examples. An essential read for all ophthalmologists.

7. Factors associated with extended remission in neovascular age-related macular degeneration on pro re nata treatment protocol.

Lin T, Dans KC, Muftuoglu IK, et al. Br J Ophthalmol 2020;104:5863.Epub 2019 July 13

ABSTRACT

AIM : To show the characteristics and outcomes of patients with neovascular age-related macular degeneration (nAMD) who had extended remission (ER) while on a pro re nata (PRN) treatment protocol.

METHODS : This was a retrospective case-control study of a consecutive series of patients with nAMD treated with a PRN antivascular endothelial growth factor (anti-VEGF) drug regimen. ER was defined as the absence of haemorrhage, intraretinal/subretinal fluid on optical coherence tomography and leakage on fluorescein angiography for 52 weeks after cessation of anti-VEGF therapy. Matching patients with nAMD who did not achieve ER were included as control group. Cox regression analysis was fitted to identify predictors of time to achieve ER and time to recurrence. A logistic regression analysis of baseline characteristics was used to identify predictors of achieving ER.

RESULTS : Of 830 eyes treated with anti-VEGF monotherapy, 77 (9.2%) eyes achieved ER during a median follow-up of 236 weeks (range 70-525 weeks). Cox regression analysis showed that ER was achieved earlier in eyes with isolated intraretinal fluid (HR, 2.05; 95% CI 1.929 to 4.520; p=0.045) at presentation. Logistic regression analysis showed that type 3 choroidal neovascularisation (OR, 0.090; 95% CI 0.021 to 0.382; p=0.001), thinner choroid (OR, 0.993; 95% CI 0.988 to 0.998; p=0.004) and absence of macular atrophy (OR, 0.233; 95% CI 0.065 to 0.839; p=0.026) at baseline increased the likelihood of achieving ER.

CONCLUSION : ER is achievable in 9.2% of patients under PRN therapy for nAMD. At presentation with nAMD, anatomical features on retinal imaging may predict the likelihood of achieving ER and a shorter time to achieve ER.

This article is a sobering reminder that less than 10% (77/830 eyes) of nAMD patients on PRN treatment after 3 loading doses remain relapse-free for a year. Eyes with type 3 CNV (RAP lesion), thinner choroid, but without macular atrophy at baseline were more likely to remain free of recurrences (for at last 52 weeks) in this retrospective case-control study. The "extended remission" occurred within the first 3 years of treatment initiation in more than two-thirds of the eyes, and was earlier in eyes with intraretinal rather than subretinal fluid (which may correspond to type 3 CNV).

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1. Abulon, et al. Porcine Vitreous Flow Behavior During High Speed Vitrectomy up to 7500 Cuts Per Minute. ARVO Poster, 2012. 2. Riemann C, et al. Prevention of intraoperative hypotony during vitreoretinal surgery: an instrument comparison. ASRS Poster Presentation, 2010.* 3. Buboltz, DC. New method for evaluating flow rates and intraocular pressures during simulated vitreoretinal surgeries. ARVO Congress Poster Presentations, 2010. Fort Lauderdale, FL.* 4. Nagpal M, et al. Comparison of clinical outcomes and wound dynamics of sclerotomy ports of 20, 25, and 23 gauge vitrectomy. Retina. 2009;29(2):225-231. 5. Davison JA, Cumulative tip travel and implied follow ability of longitudinal and torsional phacoemulsification J Cataract Refract Surg 2008; 34:986–990 6. Alcon data on file 954-0000-004. 7. Fernández de Castro, L. E. et al. (2010). Bead-flow pattern: Quantization of fluid movement during torsional and longitudinal phacoemulsification. J Cataract Refract Surg 36(6): 1018-1023.
*Based on bench lab testing.

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