Delhi Ophthalmological Society

Contents

DOS Teaching Programme

Comprehensive Ophthalmology

16th & 17th February, 2013 (Saturday & Sunday)
at Jawahar Lal Auditorium, AIIMS, New Delhi

Editorial

Welcome to DOS Annual Conference

Respected Seniors & friends,

Seasons Greetings! It is my pleasure to invite you to our 64th Annual Conference from 12th to 14th April 2013 at Hotel Ashok, Delhi.

The Annual Conference of Delhi Ophthalmological Society, the largest State Society in India with over 7000 members, has become one of the most sought after regional ophthalmology conferences of the country in recent years. We have always endeavored to bring together the best of leaders and innovators in the fields of Cataract, Refractive Surgery, Corneal Surgery, Glaucoma surgery, Strabismus and Ophthalmoplasty besides a diverse program featuring plenary lectures, symposia, core instructional courses, master classes, hands-on wetlabs and live surgery demonstration.

In addition to attendees from different regions of the country, we also attract a large number of national and international speakers and delegates who contribute to what has become one of the most important educational events in the ophthalmological calendar.

The Annual Conference of our society is really a 3 day celebration of Ophthalmology showcasing the best there is. The theme of this year's Annual Conference being **"Gen Next"** embarks aptly on the recent advances in modern Ophthalmology and your participation will evolve and mould the ophthalmic spirit of the conference. We are immensely pleased to welcome you to our Annual Conference and our city. **"Gen Next"** will endeavor to be maintain its global focus on the ophthalmology ensuring

Indian Ophthalmology remains at pace with all the recent international advances in Ophthalmology.

We hope to welcome you to Delhi to experience the Capital city's many fascinations of a modern metropolis inclusive of world class airport, wide roads, swank radio taxis providing excellent connectivity, the Delhi Metro Rail, and last but not the least the memorable culinary experiences and the tastes of India.

Come, behold & partake in flavors of "Gen Next"

Rohit Saxena
Secretary,
Delhi Ophthalmological Society

Delhi Ophthalmological Society

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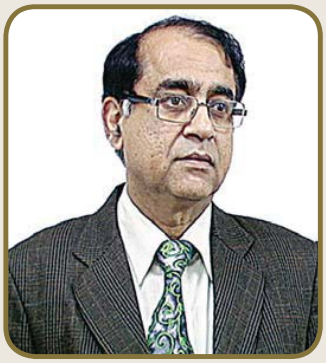
Make it Easy for Yourself



Life is but a journey towards death. We carry lot of grudges and burdens in our life. We often complain more than adjust. ***This world was there before we came***. Then is it not foolhardy to expect that persons and system around us will change according to our needs and thoughts. So what is the point in cribbing about things? If somebody overtakes you from the wrong side, is it wise to chase him and fight with him or ignore him. Suppose some madman throws a stone at you. Are you going to hit him back? Then what's the difference between him and you. It is better to ignore what is not comfortable rather than make yourself unhappy. In other words, change what you can, accept and adjust with what you can't, and swim in this world like a fish in the water. I will go a step further. *"Kuchh is tarah se humne zindagi ka safar aasan kar liya, Kuchh se humne maafi maang le, aur kuchh ko humne maaf kar diya"*. If you say something which hurts others, even if it is correct, you must apologize at the earliest.

Instead of having frustration, anger and dissatisfaction with others, it is better to have compassion for them. This will not only make you a better person, but will win the respect and love of others. For example, take your workplace. There is no point in scolding or fighting with your subordinates. It will only decrease their efficiency. The first step should always be to explain what is expected of them. You need to train them well. Take a genuine interest in your staff – listening to them and understanding them will make them feel valued. They should feel you are trying to help them to become better and more competent. I'm sure that slowly and slowly they will improve. If it still does not work, don't hesitate to get rid of them. There is no point in having a person who irritates you. But first give him a chance to improve. It always works better if you sit across the table and talk.

There is no place for arrogance in the society. Whatever anybody has achieved is for himself or at the most, for his family members. But if you feel others should give you undue respect and you have got the right to boss over them, your life is going to be miserable. All of us are launched like a missile in our life and will eventually start falling. The height and distance may vary depending on the energy and platform. ***In other words, what we are today is a product of genetics and environment, none of which was under our control when we took birth***. So there is no need for anybody to have an inferiority or superiority complex. Today we are doctors. If nature or God had been a little unkind and decreased our IQ a little bit, we would have been peons. "*Jitna kum saaman rahega, safar utna aasan rahega*." Less the me and myself, better your journey of life will be.

Dr. Harbansh Lal
President, DOS

The President, Secretary & Executive Members of

Delhi Ophthalmological Society (DOS)

Cordially invite you to

Guest Lecture by

Prof. Michael Belin

TOPICS:

- Basic is of Understanding Elevation Based Tomography
- The Belin / Ambrosio Enhanced Ectasia Display and Sceening for Refractive Surgery

Venue:

India Habitat Centre, Lodhi Road, New Delhi

Date : 14th January, 2013 (Monday), 7:00 pm onwards

Registration:

No registration fee but Prior registration is mandatory.
Registration restricted to First 100 DOS members
only on first come first basis only.
Prior Registration is available at www.dosonline.org for early registration.

Dr. Harbansh Lal
President

Dr. Rohit Saxena
Secretary

Supported by Generous Academic Grant from M/s KLB Instruments Co. Pvt. Ltd.

For further details visit **www.dosonline.org**

5th DOS Teaching Programme

16th & 17th February 2013

Jawahar Lal Auditorium, AIIMS, New Delhi

Nearest Metro Station **AIIMS** on yellow line

Comprehensive Ophthalmology

Registration Fee

Category	Till 24.01.13
DOS Member	₹ 300*
Non Member	₹ 500*

***Inclusive Service Tax @12.36%**

General Information

The Delhi Ophthalmological Society is organising it's fifth Teaching Programme "DOST-5" aimed at teaching the Post Graduate (MD/MS/DNB/ DO Ophthalmology) students. It will be a two day exhaustive course covering all important topics. All the Members & Students are welcome to attend !

64th DOS Annual Conference

12th to 14th April 2013

Hotel Ashok, Chanakyapuri, New Delhi

Nearest Metro Station **Race Course** on yellow line

OPHTHALMOLOGY **Gen Next**

Registration Fee

Category	Till 23.01.13	Till 11.03.13	Spot
Member Delegate	₹ 1800**	₹ 3000**	₹ 3600**
Member Spouse	₹ 1200**	₹ 2400**	₹ 3600**
Member Resident*	₹ 1200**	₹ 2000**	₹ 3200**
Non Member Delegate	₹ 3000**	₹ 5000**	₹ 6000**
Non Member Spouse	₹ 2200**	₹ 4200**	₹ 5400**
Non Member Resident*	₹ 1600**	₹ 2800**	₹ 4000**
Exhibitor Delegate	₹ 3200**	₹ 5300**	₹ 6400**
Foreign Delegate/Spouse/Resident	US$ 120**	US$160**	US$ 180**

IMPORTANT NOTES:

- For Spot Registrants: Complete Kit subject to availability.
- Photo I-card will be required at the time of collection of registration kit.
- *Proof of residency required from HOD along with the registration form.
- Wearing of identity badge is mandatory at all times.
- **Inclusive Service Tax @12.36%
- There will be no refund on cancellation.
- Registration limited to 5000 delegates.
- Pre-Registration closes on 11th March 2013.
- Entry to Scientific Sessions & the Exhibition Area will be Restricted to Registered Delegates only.
- Lost badge will be replaced at the registration counter for a fee of Rs.300/-
- Past Presidents of DOS or AIOS and Senior Member(>70 years) will be registered complimentary.

HIGHLIGHTS

- Live Surgery
- Free Paper
- Exhibition
- Metro Pick & Drop
- Instruction Courses
- E-Posters
- Scientific Sessions
- Gala Dinner
- Video Assisted Courses
- DOS Annual Quiz

Call for Abstract

Free Papers / E-Posters / Videos

Only Online Submission through the **DOS website : www.dosonline.org**

Last Date for Abstract Submission for Free Papers, E-posters & Videos: 1st **February, 2013**

Free Paper Session – 1 : Dr. A.C. Agarwal Trophy Session (Delhi Member). Best Free Paper will be sent to AIOS-2014. The winner will be given a travel grant to attend the same and must agree to present the paper in AIOS-2014.

Free Paper Session – 2 : Dr. T.P. Agarwal Trophy Cornea Session (Delhi Member)

Free paper Session – 3 : Winner of Best Paper in this session will be awarded " Certificate of Merit"

Conference Secretariat

Dr. Rohit Saxena *Organizing Secretary*

Room No.: 479, 4th Floor, Dr. R.P. Centre for Ophthalmic Sciences, AIIMS, Ansari Nagar, New Delhi - 110029, India

Email : dosrecords@gmail.com Website : www.dosonline.org

Delhi Ophthalmological Society

5th DOS Teaching Programme

16th & 17th February 2013

Jawahar Lal Auditorium, AIIMS, New Delhi

64th DOS Annual Conference

12th to 14th April 2013

Hotel Ashok, Chanakyapuri, New Delhi

Gen Next

The first international DOS conference kicked off with high energy and rising spirits. With over 170 participants, the social and academic meeting was all set to be a success from day one. The purpose of the meet was to enable the DOS members from across the country to network and form bonds, both professional and personal, while learning in an informal environment. The first day started with a welcome brunch at the conference hotel in Pattaya giving an opportunity for all the delegates to interact and break the ice. In the afternoon, an Indian lunch was organised followed by a visit to the biggest and most popular shopping malls of Pattaya. Everyone enjoyed group shopping with a mind boggling variety of goods available. The evening saw the members and their families watch the spectacular Alcazar show known for its excellent choreography and vibrant colours.

This was followed with a Gala dinner at a popular restaurant Fusion with a cordial relaxed atmosphere. The highlight of the dinner was a special round of introduction where all members introduced themselves and their spouses, to help everyone to get to know each other. Impromptu on stage performances by the participants added to the fun filled evening. A sumptuous meal and great music complemented the jolly ambience of the evening. Day one ended with the delegates charged up for the coral island tour and academic sessions of the second day.

Day two of the conference started with a lavish breakfast followed by a trip to the Coral islands. Everyone enjoyed the complimentary speedboat rides, parasailing and Banana boat rides. The more adventurous lot went walking under the sea in scuba costumes for an enthralling experience. The serene beach and clear waters helped everyone unwind. This excursion was followed by a lunch at the hotel which boasted a wide spread of dishes to please all palates.

The first of the well planned and relevant scientific sessions was conducted that evening. It saw talks from eminent faculty and was attended and appreciated by all the ophthalmologists. The session titled Advances in Ophthalmology had talks which most fields of ophthalmology and were each followed by interactive discussions. Professor Sudarshan Khokhar opened the first session with a controversy when he discussed the merits and potential demerits of blue blocking lenses which was followed by video based presentations by Dr. Harbansh Lal and Dr Lalit Verma who showed the audience the management and mismanagement of posterior capsular ruptures during phacoemulsification. Professor Vimla Menon and Dr Gajendra Chawla shifted the focus to the back of the eye when they spoke about optic neuritis and retinal vein occlusion respectively. Dr Vikas Mittal added a twist to the tale of keratoplasty by describing a sutureless technique for component keratoplasty.

Day three started with a breakfast at the hotel followed by a second academic session which covered various topics from diverse fields of ophthalmology. The session titled "Everyday Ophthalmic Practice" was chaired by Dr. MS Boparai and included talks ranging from management of a case of squint by Dr Rohit Saxena to evaluating a case of glaucoma by Dr Vinita Ramnani, both of which are cases commonly faced in routine practice. Offbeat topics such as NABH accreditation and psychological work in practice were well appreciated by the audience. Healthy discussions followed the talks.

The afternoon schedule comprised of a trip to the Nong Nooch village. This village is a garden resort with beautiful botanical sights and rare plants. The village also showcased a traditional Thai cultural show along with an elephant dance and sport show, both of which were appreciated by everyone.

In the evening, the delegates were driven to Bangkok for a night cruise and the second leg of the trip. The cruise provided an opportunity to see the sights and sounds of Bangkok from the comfort of a luxury boat while dancing drinking and dining in the middle of the river.


JDOS
International
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21st to 24th November 2012
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Ptosis Demystified

Dr. Stuart R. Seiff, MD, FACS *Emeritus Professor of Ophthalmology at UCSF,* Consultant in oculofacial and aesthetic plastic surgery at UCSF, SFGH, California Pacific Medical Center and Mills Peninsula Medical Center.

Dr. A.K. Grover, MD, MNAMS, FRCS, *Consultant and Head of Department of Ophthalmology,* Sir Ganga Ram Hospital, Rajinder Nagar, New Delhi

Dr. M.V. Vachhrajani, MBBS, DOMS, MS, *Consulting Ophthalmologist, Lid Lacrimal and Orbit Surgeon,* R. Totat Eye Hospital, Paladi, Ahmedabad, Gujarat.

Dr. Mandeep Singh Bajaj, MD, *Professor,* Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi.

Dr. Milind Naik, MD, *Consultant & Head,* Department of Ophthalmic Plastic Surgery, L.V. Prasad Eye Institute, Hyderabad

Dr. Anirudh Singh MS, DNB, FAICO: *Pediatric Ophthalmology & Strabismus*, Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India. Associate Editor, DOS Times interviewed the above panelists.

Dr. Vishnukant Ghonsikar MS, DNB, FAICO: *Pediatric Ophthalmology, Strabismus Orbit and Oculoplasty*, Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India. Associate Editor, DOS Times interviewed the above panelists.

Dr. Stuart Seiff
MD

Dr. A.K. Grover
MD,MNAMS,FRCS

Dr. M.V. Vachhrajani
MBBS, DOMS, MS

Dr. M.S. Bajaj
MD

Dr. Milind Naik
MD

Ptosis is one of the important entities which is dealt by the general ophthalmologist on a routine basis. If not treated properly it leads to significant functional and developmental difficulties. Each ptosis case is challenging and could possibly be managed weighing a lot of parameters into consideration which may vary from surgeon to surgeon, however significant doubts and controversies still exist in managing different types of ptosis despite recent advances. Our associate editors *Dr. Anirudh Singh* and *Dr. Vishnukant Ghonsikar* interviewed the panelists comprising of eminent oculoplastic surgeons from India and abroad to highlight these grey zones and the best possible management.

Anirudh Singh: What is the ideal age to manage a case of congenital ptosis?

Stuart Seiff: For unilateral cases with poor LPS function, I tend to prefer early suspension procedures eg 1-2 years of age. I feel this gives the best chance for achieving bilateral use of the lids. This can be aided by patching the good eye post op for 1-2 hours per day. For bilateral cases with severe visual obstruction, I have done these cases with bilateral silicone slings as early as 1 month of age. Other developmental delay such as late walking, I do these cases around 1 year of age to enhance general development. Uncomplicated cases I still operate between ages 3 and 5.

A.K. Grover: The refraction and squint evaluation of a child with ptosis should be done as soon as he presents. A levator surgery can be done at 3 years of age. Sling surgery with fascia lata can be done as early as 4 years of age. However, a severe ptosis causing amblyopia will need an earlier surgical intervention even at the age of a few months.

M. Vachhrajani: Ideal age is when we are able to assess the case properly unless the ptosis is unilateral, severe, covering the pupillary axis and likely to give rise to deep amblyopia. Such Ptosis needs correction at the earliest with temporary sling after explaining the parents for the need of definitive surgery later in life. Bilateral cases usually develop chin elevation inducing Doll's head phenomenon which help the child to develop useful vision. These cases can be left alone till preschool age. One should look for signs of development of Inferior Rectus Contracture in such cases. Positive FDT needs intervention.

M.S. Bajaj: The ideal age to intervene in a case of congenital ptosis depends on the severity

of ptosis. In case the visual axis is obscured and the child is unable to compensate, there is a risk of developing amblyopia and one should intervene early. Even if a proper assessment of preoperative parameters is not possible, one should aim for a definitive correction. In other cases, pre-school age or later is recommended.

Milind Naik: According to me the ideal age to manage a case of congenital ptosis would depend upon the clinical presentation. In a child with unilateral severe ptosis covering the pupil and definite signs of or a threat of amblyopia, an immediate surgery is advisable. However, controversy arises when there is bilateral ptosis with good vision or unilateral mild ptosis where pupillary axis is not covered. The traditional teaching has been to observe these children and delay surgery, since visual acuity is not at immediate risk. However, the psychological effects of such an eyelid deformity on a child are hard to assess. I always ask the parents to find out from the child's school about peer-teasing, and how their child is able to handle it. If it is a significant problem, I prefer to operate early. Moreover, recent awareness about sectoral myopia in the inferior half of the eyeball due to limited superior field of vision is also a concern. My approach therefore would be to perform an early ptosis surgery after assessing all the factors.

Our panelists agree that unilateral ptosis with visual axis obstruction needs early management with possible definitive surgery at a later date.

Vishnu Ghonsikar: What are your ways of quantification of levator surgery to get optimal lid height?

Stuart Seiff: I tend to use Beard's tables for levator resection.

A.K. Grover: A good pre-operative assessment of the nature and severity of ptosis and more importantly the levator action is important. The correct surgical decision based on these parameters is most important to achieve an optimal correction. In congenital simple ptosis with a levator action of 5-6 mm, I would resect the muscle beyond the whitnall's ligament and leave the upper lid at the limbus or slightly higher than the final position desired. A levator action of about 7 mm, I would resect upto the ligament and leave the lid at the desired height. For a levator action of 8-9mm, the suture placement and amount of resection required would be short of the Whitnall's and I would leave the upper lid slightly lower than the desired position on table. In acquired ptosis, on the table judgment with the patient under local anesthesia is very critical and often just the reattachment of dehiscent levator aponeurosis is adequate.

M. Vachhrajani: In general, my preference is Levator advancement surgery without cutting the Horns under assisted infiltration anesthesia.

In mild Ptosis with good levator function, non responsive to Phenylephrine test, or in Moderate Ptosis with Moderate levator function (5-8MM), I advance anterior levator enough to ensure lid symmetry in primary position. I make the patient sit(unless child), on table to assess the symmetry.

M.S. Bajaj: I decide on the amount of levator surgery to be performed by using a paradigm based on levator action and the degree of ptosis. A final peroperative titration is done on the table, depending on where we want the eyelid in relation to the superior limbus.

Milind Naik: Quantification of levator surgery is difficult, and several nomograms have been attempted by experienced surgeons. In my experience, the Beard's approach of relying on the 'amount of levator resected' does not give predictable results. I give more importance to 'where I place the eyelid margin' in relation to the cornea in a given case. One also needs to factor in the amount of infiltration anaesthesia, and its effect on orbicularis and levator muscle. It is easy to quantify in patients with extremes of levator action. Cases with definite levator disinsertion (near normal LPS action) simply need a re-attachment, and I rely on symmetry in 'downgaze' in such cases. The other extreme is a patient with severe ptosis (poor LPS action) in whom eyelid margin can be placed at the superior limbus. For all cases in between these two extremes, I tend to use Berke's rule as an approximate guideline although there are many variables.

Most of the panelist assess the intraoperative correction on table for adults and Beard's table / Berke's rule for congenital ptosis.

Anirudh Singh: What is your approach towards Fasanella - Servat surgery?

Stuart Seiff: I do not like the F/S procedure as it tends to create an unstable tarsus if subsequent surgery is needed. It can also create notching. I find I can achieve the same results with Mullers muscle conjunctival resection.

A.K. Grover: I prefer the surgery for a mild congenital ptosis with a good levator action of 10mm or above with a well formed eyelid crease and no excess skin.

M. Vachhrajani: My preference is for Conjunctival Mullerectomy.

M.S. Bajaj: Fasanella-Servat is not my preferred surgery for mild ptosis as I feel that it is not physiological in nature. Performing a tarsectomy on a normal tarsal plate could lead to significant complications such as entropion and dry eye in the long run. I would rather go for a small plication, preferably by the conjunctival approach in these cases.

Milind Naik: I do not perform Fasanella-Servat surgery. I feel that it is unnecessary to excise a normal tarsus in order to lift the eyelid. For mild ptosis with good levator action, Mullerectomy is a much less damaging procedure. I would however choose LPS resection (anterior or trans-conjunctival approach).

Most of the panelist agree in preferring conjunctival mullerectomy for mild ptosis. Fasanella - Servat surgery is on decline.

Vishnu Ghonsikar: In which cases would you prefer to do LPS plication?

Stuart Seiff: Not sure what LPS plication is.

A.K. Grover: I don't prefer the procedure of plication.

M. Vachhrajani: I plicate the levator when Ptosis is moderate and with moderate levator function.

M.S. Bajaj: I would recommend levator plication in cases of mild to moderate ptosis with at least 6-8 mm of

levator function, for achieving best results, even at the initial stage of one's learning curve. At our centre, we have devised a new modified technique of plication, where it can be used for relatively severe ptosis also.

Milind Naik: Personally I have not come across a situation where I needed to 'plicate' the levator. I wonder whether anyone else across the globe is even performing this procedure. Plication in its strict sense would mean double folding the levator aponeurosis to attach it to the tarsus, and it would add more fullness to the eyelid. And advancement/resection/reattachment is a more practical and aesthetic approach.

Some of the panelist agree that LPS plication is a good option for moderate ptosis with fair to good LPS action.

Anirudh Singh: Any special precaution to get aesthetic and dynamic lid fold?

Stuart Seiff: The lid crease is created at the point of highest attachment of the levator fibers to the skin-orbicularis complex. This should be a consideration and planned for in every ptosis repair.

A.K. Grover: To get a dynamic and aesthetic lid fold in a levator surgery,only few superficial lid fold forming sutures should be taken. For a good levator action, 3 superficial bites through the levator are enough. In patients with poor levator action,around 5 deeper bites are required. In cases of resurgery with lid scaring, upto 7 deep bites going upto the edges of the incision may be required, though it may be difficult to get a dynamic fold in these cases.

M. Vachhrajani: As said earlier, I prefer to operate under Infiltration anaesthesia with mild sedation given by anesthesiologist. For getting a dynamic lid fold, my skin suture passes from lid margin anteriorly through entire depth of pretarsal orbicularis, taking a bite through aponeurosis and comes out at the margin posteriorly through skin, not taking the preseptal orbicularis along with. These are interrupted 6(0) Nylon sutures.

M.S. Bajaj: To achieve an aesthetic and dynamic lid fold, one should take relatively superficial bites through the levator stump after resection. In levator plication one can achieve a good lid fold even without these lid fold forming bites through the levator. Of course, this is in addition to steps taken to achieve overall dynamicity and cosmesis.

Milind Naik: I believe that a good dynamic eyelid fold is a function of levator action and it cannot be 'created'. However, deepening the lid fold is necessary to give a natural look to the eyelid. I tend to fix the lower edge of my lid crease incision (dermal bite) to the upper border of the tarsus or even stump of the levator muscle. This deepens the lid fold, and also avoids multiple creases in the pre-tarsal region.

Most of the panelist agree that to achieve aesthetic and dynamic lid fold, the bite has to be passed through the LPS fibers.

Vishnu Ghonsikar: What is your method of procuring fascia lata?

Stuart Seiff: I use a fascia stripper and harvest myself. I do not use banked fascia anymore due to its unreliability. However, I do most frontalis suspension with silicone rods.

A.K. Grover: I prefer a manual approach for procuring fascia lata. A one inch incision in the central 1/3rd area of the 4 inch line joining the iliac spine and lateral condyle starting about an inch above the condyle is sufficient to get an adequate length strip of the fascia. This is obtained by using a long scissor for undermining, cutting on the two sides and making the incision above and below.

M. Vachhrajani: Not fond of using Fascia lata for frontalis sling. My preference is for silicone sling since it is convenient, hassle free and gives reasonable correction with minimal lagophthalmos at the night time.

M.S. Bajaj: My preferred technique of procuring facia lata is through a small thigh incision followed by a harvesting with a facia lata stripper.

Milind Naik: I use a small 1.5cm incision, and utilize a zero degree endoscope (along with the endoscope sleeve used in brow-lift surgery) to procure the deisred length of fascia lata.

Some of the panelists prefer using silicone sling, however harvested fascia lata is still the gold standard for many oculoplastic surgeons

Anirudh Singh: What is your experience with different materials in sling surgery?

Stuart Seiff: I prefer silicone and if not available I use harvested fascia. I do not think that banked fascia, sutures, or gortex (supramid) are acceptable for a variety of reasons.

A.K. Grover: I prefer a fascia lata for most cases and perform the procedure bilaterally. If at all I do a unilateral surgery, I use a silastic sling. I don't use any other sling materials.

M. Vachhrajani: Suture slings done for temporary correction of severe Ptosis, led to slippage more often and lid tends to droop with passage of time. With Gortex., suture granulomas was a major problem.

M.S. Bajaj: Even though Facia lata is still considered the gold standard for frontalis sling, other synthetic materials have given promising results, e.g. PTFE and Silicone. Silicone has the added advantages of being extremely biocompatible and elastic, thereby producing lesser lagophthalmos and fewer granulomas.

Milind Naik: I primarily use sutures, silicone rod, and fascia lata as my options for a sling surgery. For children within the amblyogenic age, I prefer a suture sling with a 'single stab' incision described by the UCLA group. I find the 'closed' technique using silicone rod sling in a pentagon fashion to be quick, reliable and safe option in cases where the indication is mainly cosmetic. Silicone rod is particularly safe in situations where bells is poor or there is a component of myogenic ptosis, where the risk of exposure is high. Based on everyone's experience across the globe, fascia lata would be the gold standard in terms of longevity of the sling effect . Finally, all sling surgeries have a limited life, and a repeat surgery is the rule. When a sling surgery is chosen for a patient, we can only 'maintain' the lid height (through multiple procedures over lifetime) rather than 'correct' it.

Most of the panelists agree that silicone is emerging as the preferred option for sling surgery over fascia lata.

Vishnu Ghonsikar: What are your treatment strategies for ptosis with Marcus Gunn phenomenon?

Stuart Seiff: In virtually all cases I elevate the ptotic lid with levator resection or sling based on the lid position and function without "winking". I pretty much ignore the wink. I have found that in the elevated position the "wink" is not very noticeable and the kids learn how to avoid winking by controlling oral movements.

A.K. Grover: I do a bilateral levator excision with fascia lata for a patient needing surgical intervention for Marcus Gunn. I use a technique described by me, where I avoid dissection on the tarsal surface while excising the levator aponeurosis and perform fascia lata sling surgery by a double triangle technique in a closed method without any tarsal fixation sutures. This gives an excellent elimination of jaw winking symmetrical correction, contour and lid fold. Milder cases of jaw winking may undergo a levator resection.

M. Vachhrajani: Marcus Gun is a complex problem. In some, Jaw winking is pronounced and bothersome and in others Jaw winking is mild. I leave the decision to patient or parents regarding the type of correction they want. If Jaw winking has to be corrected then I advise Bilateral surgery. Affected eye will undergo Levator disinsertion and frontalis suspension and the normal eye only supportive Frontalis sling so that both eyes look symmetrical in primary position, have symmetrical down gaze and jaw winking is taken care of. If jaw winking is not pronounced or patient is not ready for bilateral surgery, moderate ptosis could be corrected by anterior levator surgery to symmetrize the eyes in primary position Patient is taught to move the head down instead of moving the eyes down while looking down.

M.S. Bajaj: In cases of mild excursions of jaw winking (<2mm), a ptosis correction alone is usually required. In cases where MGWP is significant, the practical surgical options include levator disinsertion and cauterization of the stump with bilateral / unilateral sling.

We are also revisiting the area of Levator Sling with certain modifications.

Milind Naik: For ptosis with Marcus Gunn phenomenon, I discuss with the patient to identify whether the primary concern is their ptosis or the jaw-winking. In cases of mild to moderate ptosis with minimal Marcus Gunn, I try to address the ptosis only. In cases of severe Marcus Gunn, I perform a frontalis sling surgery but without excising the levator muscle. I find that a sling surgery alone 'dampens' the excursion of the jaw-winking movement.

The panelists agree that levator disinsertion with silicone sling is a reasonable option for significant Marcus Gunn phenomenon.

Anirudh Singh: How and at what age do you manage ptosis in blepharophimosis syndrome?

Stuart Seiff: I tend to revise the epicanthus at about age 3 and the ptosis about age 4 unless there are other considerations as mentioned above.

A.K. Grover: In blepharophimosis, first stage procedure is a Y-V plasty with transnasal stainless steel wiring after making large bony windows. For the second stage, I wait till the age of 4 years before doing ptosis surgery as I do a fascia lata sling in these cases. In milder cases, a single stage procedure using bilateral Y-V plasty with MCT plication and fascia lata sling surgery is undertaken.

M. Vachhrajani: I am comfortable doing a Correction in stages. In First stage, I correct telecanthus (MPL plication if found lax intra operative or transnasal wiring) and blepharophimosis. The palpebral fissure gets closed following the surgery. After an interval of 6 to 8 weeks when the lids open up, the ptosis is corrected by bilateral frontalis suspension. There is no age bar. I have operated cases at 1 year and as late as 14 yrs!!

M.S. Bajaj: As mentioned earlier, the severity of ptosis governs the decision on the age of intervention. Similarly, in cases of Blepharophimosis Syndrome with severe ptosis, we prefer to do an early ptosis correction, followed by canthoplasty at a later age. In other cases canthoplasty is done first and a time interval of atleast 6 months is equired for tissue molding to occur before ptosis surgery is undertaken.

Milind Naik: In Blepharophimosis syndrome, I only address the ptosis component in the amblyogenic age. Our experience with analyzing cases of medial and lateral canthoplasty for cosmetic correction of blepharophimosis syndrome has been grim, and I do not notice any significant improvement in the size of the horizontal palpebral aperture following surgery. On the contarary, the scars look ugly, and visible. I therefore avoid canthoplasty surgery in these patients and hopefully await a path breaking treatment modality for this difficult condition.

Vishnu Ghonsikar: When do you intervene in traumatic ptosis cases?

Stuart Seiff: I wait 4-6 months before exploring the lid. I find little value in acute exploration, in spite of the literature suggest otherwise.

A.K. Grover: Management of traumatic ptosis would depend on when the patient presents. I would do an exploration and reattachment of the levator if the patient presents early. For late presentations, the surgical intervention would depend upon the amount of ptosis and levator action. It may be a fasanella servat or levator surgery. In some cases of extensive fibrosis, a sling surgery might be the only resort, taking care of the associated conjunctival prolapse/ exposure that sometimes tends to manifest.

M. Vachhrajani: If a patient presents with traumatic ptosis immediately following a blunt trauma, I wait till 4 to 6 weeks till edema subsides and lid start showing lifting movement. If there is progressive improvement, I wait for 3 to 4 months for full recovery to take place.

If a patient presents with primary repair of traumatized lid elsewhere immediately and there is no flicker of movement in traumatized lid, I observe the patient for lid movement for a week using anti inflammatory medications. If no improvement is noted whatsoever, I open up the lid to re establish the anatomy. It is easier to open up the wound and do the repair before it gets fibrosed.

M.S. Bajaj: In Traumatic ptosis, if the patient presents early with other manifestations of periocular trauma, it is important to perform a diligent exploration and realign the anatomical structures to prevent a major secondary

reconstruction. Otherwise, in a pure post-traumatic ptosis, it is prudent to wait for 4-6 months for recovery before intervening.

Milind Naik: For traumatic ptosis where neurogenic component is evident, I would wait for 6 months to a year if the patient is not in the amblyogenic age. At the end of the waiting period or when I find that the findings are stable. Based on the levator action I would decide to perform either levator resection or tarsofrontal sling surgery.

The panelists are more or less unanimous in waiting for 4-6 months in cases of traumatic ptosis presenting late, however early intervention to reestablish surgical anatomy of the lid can be undertaken for acute cases.

Anirudh Singh: What are your treatment strategies for involutional ptosis?

Stuart Seiff: Previously I performed aponeurotic repairs or advancements. Now I prefer Muller muscle conjunctival resections in all that respond favorably to the phenylephrine test...which is the majority of cases.

A.K. Grover: Reattachment of the levator muscle is my first choice in an involutional ptosis. Some cases with decreased levator action require resection. On the table assessment is critical.

M. Vachhrajani: Involutional ptosis is due to disinsertion of levator aponeurosis. Lid crease tends to move higher towards superior sulcus and there is marked down gaze drooping of lids. There could even be high arched brows due to futile attempt to elevate the lids.

Under infiltration anaesthesia, disinserted levator apponeurosis is advanced and attached to tarsus. One has to be careful to avoid over correction in such cases. If there is marked degeneration of aponeurosis, one may need hangback sutures to attach levator at the tarsus to avoid over correction. Small Blepharoplasty helps improving the overall look.

M.S. Bajaj: The best strategy for involutional ptosis is to correct as many components of age-related eyelid and adnexal changes in the same sitting viz. septal weakening, orbital fat prolapse, dermatochalasis, horizontal or vertical lid laxity etc. For the ptosis per se, aponeurotic ptosis surgery gives best results.

Milind Naik: For involutional ptosis I prefer to perform LPS reattachment surgery. I choose posterior approach for ptosis correction, and anterior approach if a simultaneous blepharoplasty is also planned. In bilateral (symmetrical or asymmetric) cases, I choose to operate one eye at a time (worse eye first), learn from the response, and then address the other eye in a few weeks.

The panelists preferred external levator aponeurosis advancement for involutional ptosis with or without blepharoplasty.

Vishnu Ghonsikar: How will you manage ptosis in cases with compromised Bell's/ monocular elevation deficit?

Stuart Seiff: Most of these have decreased levator function. In such cases, I prefer silicone slings and work toward modest elevation of the lid. With silicone, it is easy to further elevate the lid later as tolerated. One needs to limit corneal exposure.

A.K. Grover: I would first do a Knapp's procedure for a mono-ocular elevation deficit or an inferior rectus recession if the FDT is positive. A subsequent ptosis surgery is done after 3 months. An optimal correction is possible in most patients as the Bell's improves. For cases with superior rectus underaction, inferior rectus recession is carried out. It is possible to provide a satisfactory outcome to most cases with motility disturbance including the 3rd nerve palsy cases. I am increasingly convinced that it is unjustified to deny a judicious ptosis procedure to these cases and they do tolerate the lagophthalmos well with good post op care.

M. Vachhrajani: I am scared on operating in eyes with poor or absent Bells phenomenon which is seen with III rd neve palsy and Chronic progressive Ophthalmoplegia. After all the explanation, if patient desires, frontalis sling surgery could be done with elevation just enough to clear the pupil for locomotion and be ready for adjustment if exposure threatens the vision.

M.S. Bajaj: In cases of single or double elevator palsy, it is mandatory to achieve surgical correction of the elevator weakness prior to ptosis surgery. In cases of compromised Bell's phenomenon, one would aim for a slight under-correction of the ptosis, followed by strict post-operative monitoring of corneal status.

Milind Naik: In a case of compromised Bells phenomenon, I would prefer a sling surgery with silicone rod. In cases of monocular elevation deficit, I would have our strabismologist to evaluate the patient to check if a squint surgery is required, and perform a ptosis surgery following the same. In most cases, this also gives me an opportunity to release the lower eyelid retractors if the strabismus surgery has led to lower eyelid retraction.

Undercorrection with silicone sling under guarded prognosis is a preferred option of most of the panelists for compromised Bell's.

Anirudh Singh: Any precautions in managing ptosis secondary to neurological/muscular disorders?

Stuart Seiff: Same considerations as above.

A.K. Grover: A poor bell's is usually the main problem in patients of neurological or muscular disorders. I would prefer a sling surgery with a silastic sling in these cases as it provides a fair closure due to its elasticity and provides the flexibility of adjustability and reversibility of procedure.

M. Vachhrajani: No levator surgery. Only Frontalis suspension is advised which can be reversed if need be.

M.S. Bajaj: The classical approach would be to treat the underlying disorder medically, which usually takes care of the ptosis. The use of crutch glasses in unresolved cases is a viable option depending on patient tolerance and compliance. However, in selected cases, one may need to lift the eyelid surgically, just enough to clear the visual axis.

Milind Naik: Ptosis secondary to neurological disorders is requires a team approach along with the strabismologist. The extent to which ptosis can be corrected would depend upon the levator action and the Bells phenomenon. In cases of muscular disorders such as established myasthenia, the treatment is mainly medical. In cases such as CPEO crutch spectacles can be tried, or in selected cases under-correction with silicone sling can provide improved lid height.

Vishnu Ghonsikar: How and when do you manage undercorrection or overcorrection?

Stuart Seiff: I usually wait 3 months to revise. If severe exposure, I will address earlier. Sometimes botulinum toxin to the forehead will allow the brow to drop and help with the corneal exposure.

A.K. Grover: An early revision surgery can be done in both cases within a week if the patient presents early. In delayed presentations, I would wait for around 3 months before doing a resurgery for an undercorrection. For mild overcorrections, an incision through the conjunctiva and partial thickness levator through the posterior approach (Berke's) works well. Severe or persistent overcorrections may need a skin approach levator recession with a graft such as sclera placed between the tarsus and the muscle.

M. Vachhrajani: Under correction is more common and I have to redo it in nearly 1/3 of my patients. Overcorrection is rare I had to correct it only in 2 eyes till date.

M.S. Bajaj: A mild over-correction usually responds to conservative measures such as lid massage. Gross ones need a surgical revision. In such situations, levator plication has the unique advantage of being reversible in nature. Under-correction would require a surgical revision once the lid height has stabilized.

Milind Naik: An under or over correction is a known complication of levator resection surgery. I generally address it at one week postoperatively. Over-correction if mild to moderate, can be managed either by lash push-up exercises performed by the patient. Controlled eyelid traction under minimal local anesthesia in the clinic is also a good alternative in selected cases. For severe over correction, I would release the cardinal sutures trans-conjunctivally. For under correction I wait for 3 months, following which I perform a repeat surgery.

Undercorrection is commoner than overcorrection, if significant needs a revision at around 3 months or once the lid height has stabilized.

Anirudh Singh: What precaution do you take to avoid lid notching?

Stuart Seiff: In levator resection or advancement, I make sure my tarsal/levator sutures are radial. Further I avoid F/S procedures.

A.K. Grover: Proper placement and tightening of sutures and sling aided by good intraoperative assessment is important for preventing lid notching. In levator resection, the tarsal bites should be placed about 2 mm below the upper tarsal border. The bites should not be placed on the medial and lateral edges and should remain largely in the central third. Moreover, while tying the sutures, the lid contour should be closely checked and the tension at the knots may be titrated to avoid notching. In Fasanella Servat procedure, it is important to avoid large central excision to prevent central peaking.

M. Vachhrajani: Avoid passing a suture too anterior on to the tarsus and at unequal distances keeping limbus as a guide.

M.S. Bajaj: To prevent lid notching in levator surgery, uniformly placed, wide suture bites should be placed while plicating or reattaching the levator. The medial suture should be kept at a conservative tension to get good lid contour. In Frontalis sling surgery, physiological placement of the sling material in a multi-point configuration, such as Crawford's double triangle gives an aesthetic contour.

Milind Naik: To avoid lid notching in levator surgery, I take wider bites on the tarsus when I am placing the cardinal sutures. Secondly I tend to perform tarsconjunctival levator resection more often which inherently gives good contour and minimizes surprises such as lid notching.

The panelists agree that sutures should be equidistant and radial with slight adjustment of medial suture for good lid contour.

Vishnu Ghonsikar: How will you minimize lid lag and lagophthalmos?

Stuart Seiff: This is inherent to levator resection surgery. Less so with levator advancement. We see almost no lag with Muller's Muscle Conjunctival Resection (MMCR).

A.K. Grover: An important measure to prevent lid lag and lagophthalmos in a levator surgery is proper dissection and opening of the orbital septum. The septum should not be resutured after resection

M. Vachhrajani: Lid lag and the lagophthalmos is the rule in Congenital dystrophic Ptosis repair.I understand that bilateral sling in unilateral ptosis does help in correcting down gaze lid lag, though I am not a great fan of such advocacy! Silicone sling does have a pliability and help in minimizing nocturnal lagophthalmos.

M.S. Bajaj: In Levator surgery, meticulous dissection of the levator aponeurosis, including proper release of the orbital septum and generous incision of the medial and lateral horns, go a long way in minimizing lid lag and lagophthalmos. In Frontalis Sling, the choice of material will usually determine the degree of these complications.

Milind Naik: Lid lag and lagopthalmos are inevitable components of any levator resection or sling surgery. Rather, it is an indicator of the success of the surgery. There is very little one can do avoid lid lag and lagophthalmos. However, if sling surgery is being performed, lagophthalmos can be minimized by choosing silicone rod as the sling material.

MMCR, avoiding orbital septum in suturing and meticulous dissection of the levator horns are the options for minimizing lid lag and lagophthalmos.

Anirudh Singh: Tell us about your experience of conjunctival approach ptosis surgery?

Stuart Seiff: See above. MMCR is my absolutely preferred ptosis surgery in phenylephrine responsive ptosis. The only caveat is an anterior approach may be preferred if crease or fold management is also required.

A.K. Grover: I don't prefer the conjunctival approach for most cases of ptosis surgery except the Fasanella servat surgery. I was not greatly enthused by my experience of conjunctiva muller's excision in cases of congenital ptosis.

M. Vachhrajani: I do not perform conjunctival repair for congenital or involutional ptosis as a routine. I perform Conjunctivo Mullerectomy for mild (1 to 2mm ptosis which responds to Phenylephrine test) Ptosis with excellent levator function.

M.S. Bajaj: One can achieve results comparable to the cutaneous approach with conjunctival approach levator surgery. We have devised a technique of plicating the levator through the conjunctival approach with excellent results.

Milind Naik: Conjunctival approach ptosis surgery could mean either a Mullerectomy or a conjunctival approach levator resection. My experience with both these procedures has been good. I choose Mullerectomy for mild ptosis where I want a predictable result. However, I find myself shifting more to trans-conjunctival levator resection surgery because of its ease, speed, absence of lid scar, and its inherent tendency to give a good lid contour.

The conjunctival approach for levator surgery is emerging as a acceptable modality for mild to moderate ptosis with a good lid fold

Vishnu Ghonsikar: Do you foresee any future for adjustable ptosis surgery?

Stuart Seiff: No. As most of the procedures require adjustment in the first 24 hours, the results remain unreliable due to edema.

A.K. Grover: I don't find adjustable suture surgery very useful and I am not using them.

M. Vachhrajani: Present day Silicone sling surgery is adjustable suture surgery only!! Over correction needs loosening of sleeve and under correction advancing the sling further anteriorly.

M.S. Bajaj: Adjustable sutures are a useful adjunct in ptosis surgery for final post-operative adjustment. My only reservation with cutaneous adjustable sutures is that the window period available for adjustment is not sufficient for the post-operative reaction to settle down. Conjunctivally placed sutures may be the answer, where adjustment would be possible even when the lid height has stabilized.

Milind Naik: I do perform adjustable ptosis surgery, albeit rarely. I feel that adjustable surgery does not eliminate all the variables that could contribute to the success of ptosis surgery. Adjustable surgery however is a good option in traumatic cases where the exact action of the muscle cannot be predicted especially if you are forced to perform the same under general anesthesia. I think there is scope to further refine this technique and find out its reliability in comparison to the standard procedures.

Adjustable sutures is yet to become popular among the oculoplastic surgeons because of the narrow time duration for adjustment, however the future is still open.

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Associate Editor
Vishnukant Ghonsikar MS, DNB, FAICO

Election Commission

DOS Executive nominated honorable **Dr. G. Mukherjee as Chairman** of the Election Commission for the next DOS election for the held on 14th April, 2013.

The members of the **Commission are Dr. J.C. Das and Dr. Arun Sangal**

Dr. P.K. Jain Oration & Dr. S.N. Mitter Oration - 2013

Nominations are invited for the above orations. The nominee should be a voting member of the Delhi Ophthalmological Society.

Selection Procedure

Nomination should be signed by one of the following:

1. Any of the Past Awardees
2. Any of the Past Presidents
3. At least 5 members of the Executive Committee
4. At least 15 members of the Delhi Members of DOS.

The nomination must include an introductory paragraph justifying the nomination, a biodata of the nominee, a statement to the effect that the nominee would accept the award if awarded and would deliver an oration of his choice at the annual conference of the DOS. The topic should be intimated to the society at least 4 weeks before the conference and a typed script of the same should be sumitted at least 15 days before. The awardee will have to transfer the copyright of the text of his talk to the society.

Selection Process

The selection will be made by a Selection Committee consisting of the President, Secretary and 3 senior, distinguished members from 3 different sub-specialties of Ophthalmology. The Executive Committee would take the final decision on the basis of the recommendations of the Selection Committee. The nominations must be received in DOS Secretariat no later than 5.00 p.m. on **February 5th, 2013**.

Advance copy of the nominations may be sent by email. The hard copy must however be received in the DOS Secretariat by the last date for receiving the nominations.

Importance of Surgical Anatomy in Strabismus Surgery

Suma Ganesh

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A successful strabismus surgery requires clear understanding of the anatomy of the extra-ocular muscles, structures such as the conjunctiva, anterior tenon's capsule, posterior tenon's capsule (intermuscular membrane and muscle sheaths). The surgeon must know the mechanics of access to the operative site, the location as well as the blood supply, innervations, insertions and action of extra-ocular muscles[1]. Use of this knowledge helps in performing successful strabismus surgery with minimal complications.

Extra-ocular muscles

Variation in muscle insertions: There can be wide range in the variation of the distance of muscle insertions from limbus (Figure 1a). The distance is smaller in a child of 6-12 months of age by almost 1mm more close to limbus. This is more common for medial rectus insertion varying from 3.5- 6.0mm. Helveston suggested that in infants muscle insertion is a poor landmark for measurement during recession surgery and it is preferable to utilize the limbus as the landmark rather than the muscle insertion.

Surgeon needs to be aware of the anatomical variations in the location and peculiarities of the muscle, chances of congenital absence of muscle and abnormal rotation of globe due to some craniofacial abnormalities[2].

Vascular supply of muscles: When planning surgical strategy, it is essential to keep in mind the anterior ciliary circulation and the potential complication of anterior segment ischemia. In general, surgery on two rectus muscles in any eye is safe. However, patients with compromised circulation because of blood dyscrasias or pathology involving the internal carotid system may be at risk even when two recti are operated[3]. Staging of surgery, with at least 6 months before surgery on a third rectus muscle, is likely somewhat protective.

Alteration of palpebral fissure by surgery on Vertical Rectus muscles: The most problematic procedure is recession of the inferior rectus muscle, which can cause the lower lid to be pulled downward. After a large recession of the inferior rectus is performed, the ligament of Lockwood may be brought forward and sutured to the outer surface of the inferior rectus muscle. Large recession of the superior recti may lead to retraction of the upper eyelids. Resection of the vertical recti, especially if the muscles are inadequately cleaned of their fascial attachments, may cause advancement of the eyelids and narrowing of the palpebral fissure.

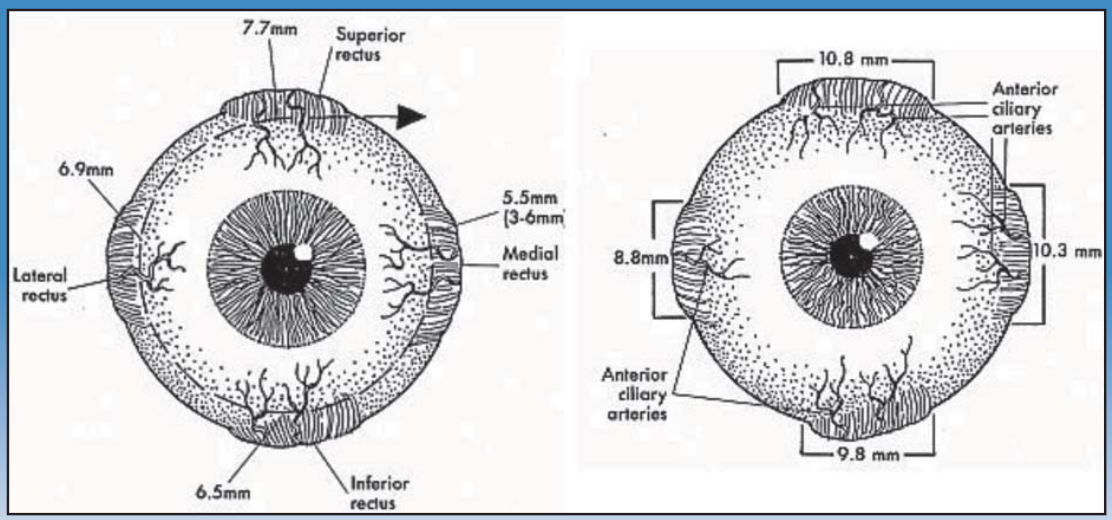

Figure 1a: *Normal anatomical points of insertion of rectus muscles and their blood supply. Helveston Atlas*

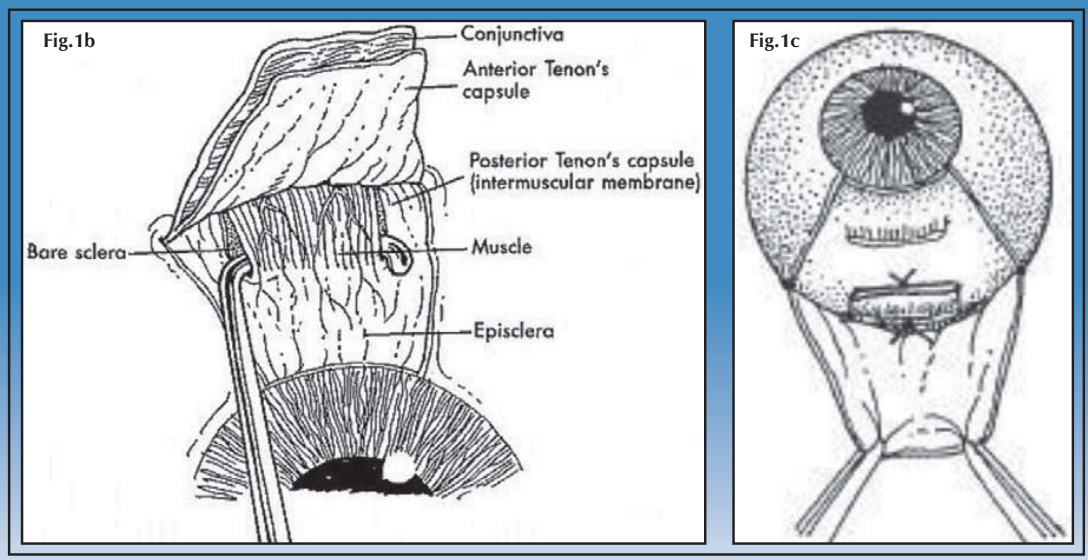

Figure 1b: *Surgical access site.* **Figure 1c:** *Inferior rectus recession with lockwood ligament sutured to muscle.* ***Courtsey:*** *Helveston Atlas*

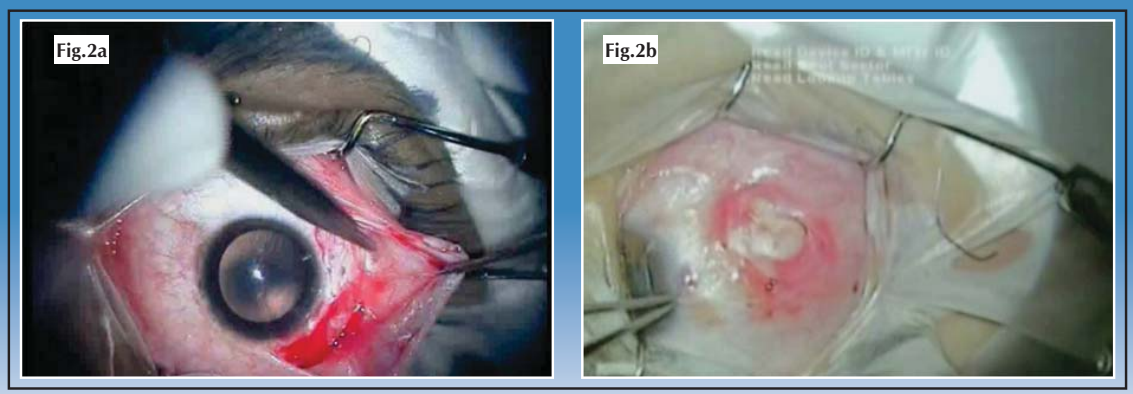

Figure 2a: *Limbal approach,* ***Figure 2b:*** *Fornix approach*

Surgical access: Where good surgical access aids in safer and faster surgery, a difficult surgical access can lead improper exposure of structures and more surgical time.

All strabismus surgery require an incision through the conjunctiva and tenon's fascia to gain access to the episcleral space (sub-Tenon's space) and all manipulations of strabismus surgery occur in this space[4].

Surgical Incision: The two most common incisions used for strabismus surgery today are- Limbal conjunctival incision (Von Noorden, Figure 2a) and Fornix (cul-de-sac) incision (Parks, Figure 2b). Each incision has its specific advantages and disadvantages but it should be kept in mind that whatever surgical approach is chosen it must provide: a. Adequate exposure b. Minimal postoperative adhesion and scar formation c. Easy to create and close d. Should facilitate reoperation by limiting scarring

Respecting the anatomy of adjacent structures

Adjacent tissues are inadvertently damaged during surgery. It is insufficiently known how wound healing of the eye muscles after strabismus surgery affects their mechanical properties. This factor therefore causes variability in the surgical outcome. Therefore, it is essential to do a meticulous and careful dissection of adjacent tissues to avoid undue damage.

- *Plica semilunaris:* Accidental incision on plica semilunaris should be avoided to prevent serious cosmetic and functional problems.
- *Tenon's capsule:* Tenon's capsule, as with all other orbital tissues, should be handled with care. It acts as a barrier to orbital fat. So, violation of the posterior aspects of the capsule can lead to unwanted intrusion of orbital fat into the surgical space (Figure 3a).
- *Vortex veins:* Inadvertent cutting of vortex vein can lead to orbital hemorrhage. Thus awareness of the location of vortex veins and careful dissection under proper visualization of structures is important (Figure 3b).

Muscle hooking and isolation

During muscle isolation only part of the intended muscle or parts of two adjacent muscles may inadvertently be hooked so, it is important to ensure that entire muscle width has

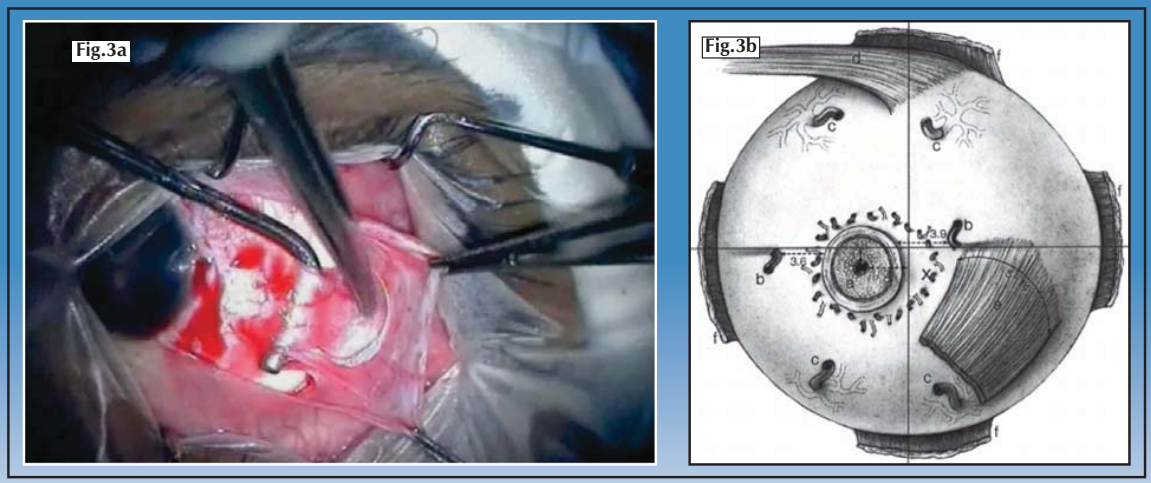

Figure 3a: *Muscle and the adjacent structures, X: Anterior Tenon's capsule, * Muscle sheath.* ***Figure 3b:*** *Vortex veins*

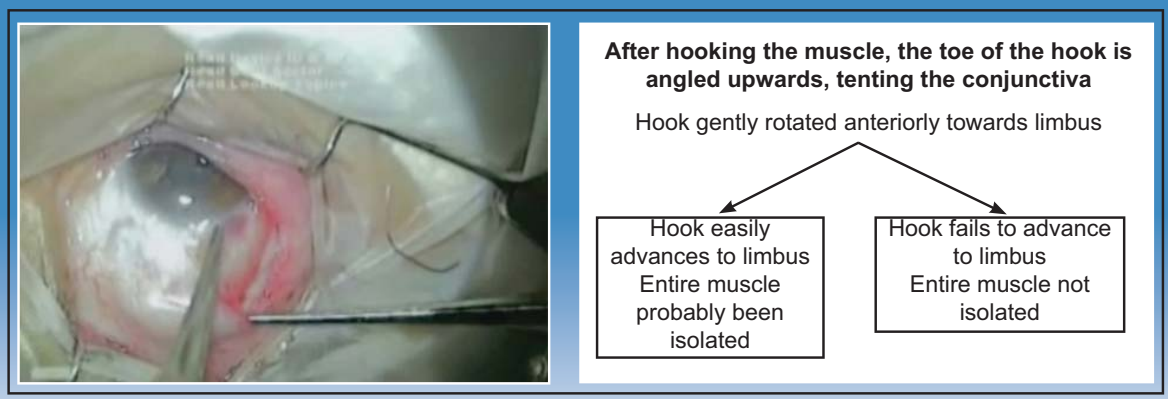

Figure 4: *Hooking the muscle: Heel/ toe maneuver to ensure that the entire muscle is isolated*

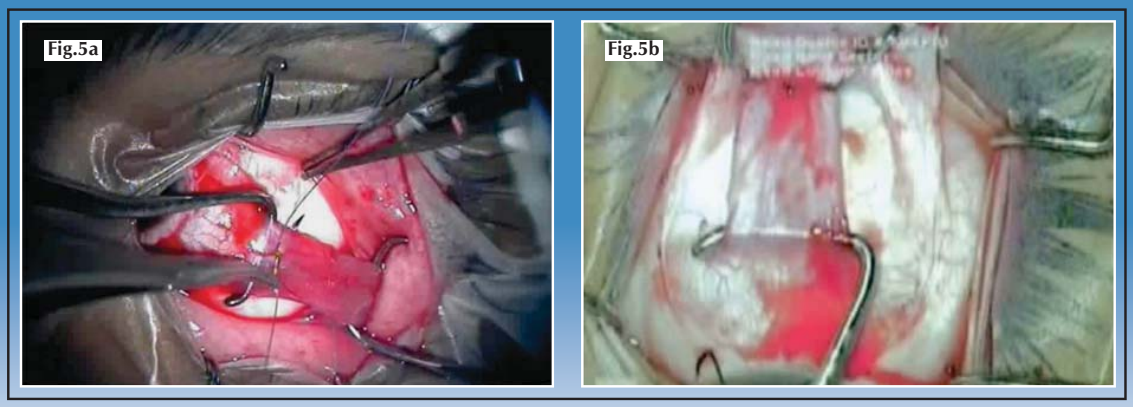

Figure 5a: *Locking suture bites should be taken through the entire width of the muscle*
Figure 5b: *Pre-place suture with locking bites before resecting a muscle*

been incorporated in the muscle hook. Before the conjunctiva is retracted to expose the muscle insertion, the Heel or toe maneuver (Figure 4) can be carried out to help ensure that the entire width of the muscle has been isolated on the hook[4].

Inclusion of inferior oblique in the insertion of the lateral rectus can occur during surgery on lateral rectus with incomplete severance of membranous connections between the two. A thorough understanding of the anatomy of inferior

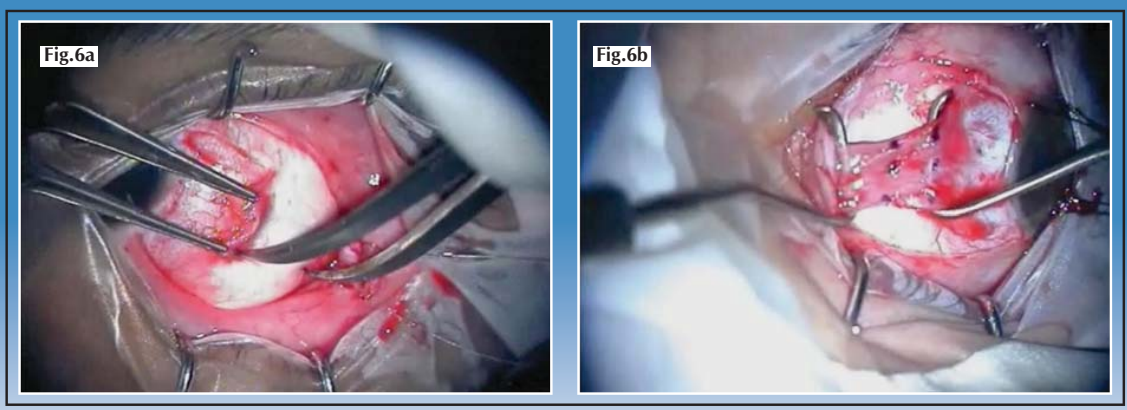

Figure 6a: *Measure from posterior end of the muscle insertion in case of muscle recessions*
Figure 6b: *Measurement of muscle resection*

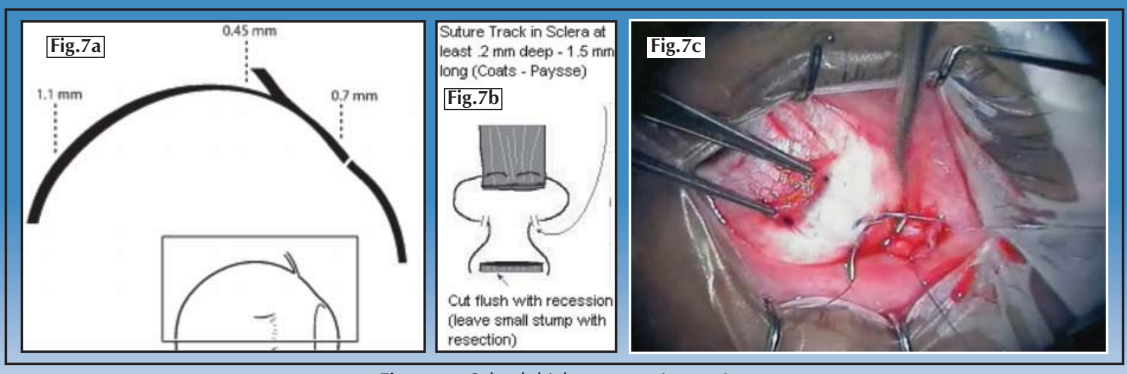

Figure 7a: *Scleral thickness at various points*
Figure 7b: & 7c: *Scleral bite: length and depth*

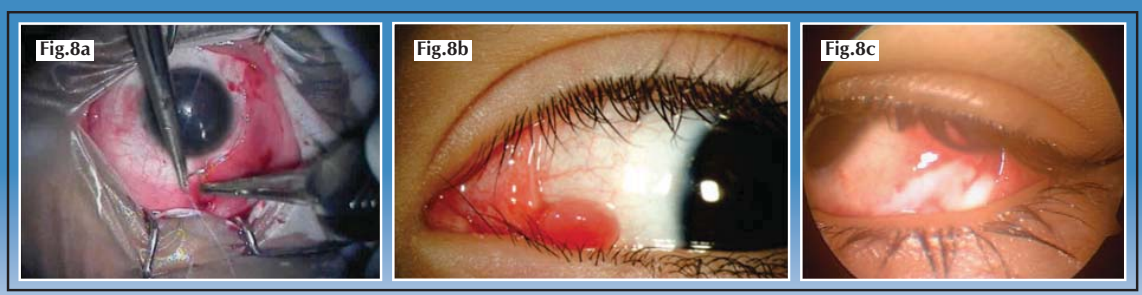

Figure 8a: *Conjunctival suturing should be meticulous.* ***Figure 8b:*** *Conjunctival inclusion cyst.*
Figure 8c: *Tenon's prolapse*

oblique and its connections with lateral rectus usually avoids this complication[5].

Iatrogenic rupture of a muscle can occur at the insertion or along its belly due to application of excessive force during traction, weak attachment of a previously operated muscle, weak muscle due to intrinsic disease inpatients with infiltrative myopathy, elderly age, prior muscle trauma or inflammatory myopathies[5].

Suture locking bites

Inappropriate placement of sutures in the capsule instead of muscle/tendon unit leads to posterior slip or loss of muscle on disinsertion. This problem is most commonly encountered with the medial rectus muscle, and is most severe if the muscle is tight, as after a resection, and has no sutures to help identify the tendon[5]. In order to avoid this, while taking suture locking bites, needle should be directed perpendicularly through the muscle to ensure that the needle is passing through the entire width of muscle and not just the muscle sheath. It is always wise to pre-place suture with locking bites before resecting a muscle in order to avoid slipping of muscle through the clamp.

Measurements for recession or resection

In recessions, measure from posterior end of the muscle insertion (Figure 7a). Both the Scott curved ruler and calipers

are accurate for measuring arc lengths less than 9mm. In axial lengths smaller than 21mm, Scott curved ruler underestimates the arc lengths.

Scleral bite

The sclera is thinnest immediately posterior to the rectus insertions, measuring less than 0.3mm in many cases, Therefore obtaining a scleral bite of optimal depth and length is crucial to secure the muscle tightly to the sclera and at the same time avoid complication of scleral perforation. A scleral bite of 0.2mm depth and at least 1.5mm length is ideal.

Type of needle: Incidence of scleral perforation ranged from 8% to 12.1% with the earlier use of reverse cutting needles because their sharp convex edge would enter the sclera deeper than the concave edge but with the use of spatulated needles this complication has become less frequent.

Conjunctival closure

A meticulous conjunctival incision closure is important to avoid formation of unsightly scars, inclusion cysts and granuloma formation.

Conjunctival inclusion cysts can present at any time, from the first few days to many years after surgery due to inadequate conjunctival wound closure. They can often be managed with topical steroids, though wound revision with excision of cyst is occasionally required in case of larger cysts.

To summarize, complications in strabismus surgery could be avoided by having clear understanding of the surgical anatomy of muscles.

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Management Options For Sixth Nerve Palsy

Digvijay Singh

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Sixth nerve palsy is the most common ocular motor palsy, due to its long and tortuous course and it location near the clivus before it enters the cavernous sinus. The etiology in both adults and children may be varied. The age group affected in adults is generally more than 40 years.

Causes of sixth nerve palsy in adults

- Systemic disorders (vascular- atherosclerosis, diabetes, hypertension)-most common
- Infections (Varicella zoster, staphylococcus aureus infection)
- Trauma (head trauma, skull fracture)
- Neoplasm (meningioma, chordoma, nasopharyngeal carcinoma)
- Haematologic (leukemia, lymphomatous meningitis)
- Aneurysm, AV malformation, ICA dissection, Giant cell arteritis
- Associated neurologic disorder (raised ICP, Intracranial hypertension)

Causes of sixth nerve palsy in children

- Trauma (head trauma, skull fracture) - more common
- Infections (CMV, EBV, Varicella zoster, meningitis)- could be after a non- specific viral illness or after immunization)
- Neoplasm (meningioma, craniopharyngioma, neuroblastoma)
- Systemic disorders (vascular- diabetes, hypertension)- less common
- Haematologic (leukemia, lymphomatous meningitis)
- Aneurysm, AV malformation
- Associated neurologic disorder (raised ICP, hydrocephalus, Arnold Chiari malformation)

Clinical presentation

- Esotropia with horizontal diplopia in acute onset cases particularly in attempting to look outwards (abduction)
- Limited/no abduction (Figure 1a)

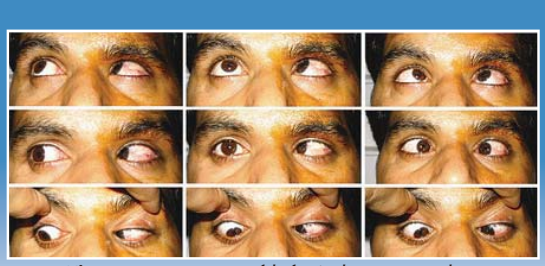
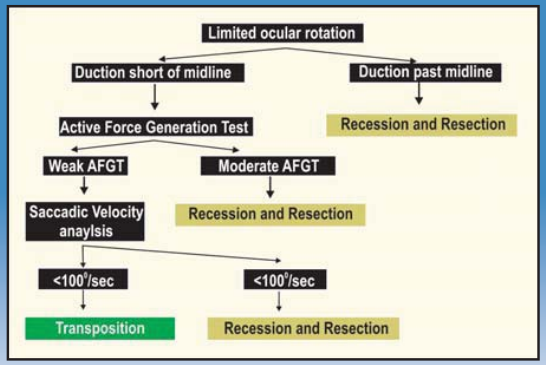


Figure 1a: *A case of left sixth nerve palsy*



Algorithm for Surgical Management

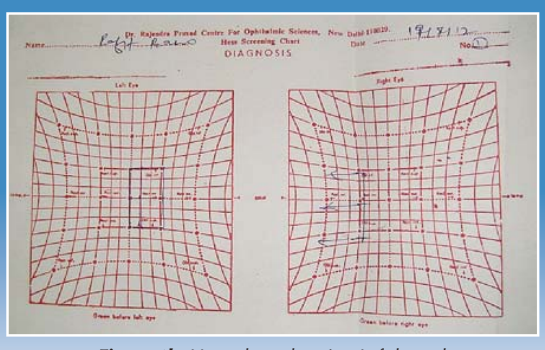


Figure 1b: *Hess chart showing Left lateral rectus palsy*

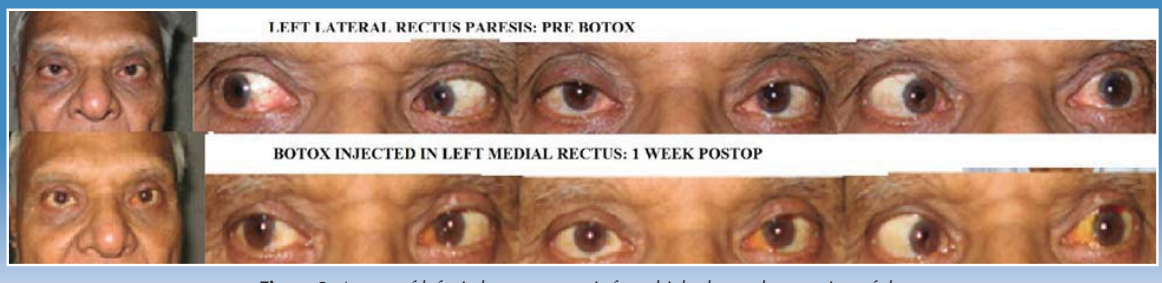
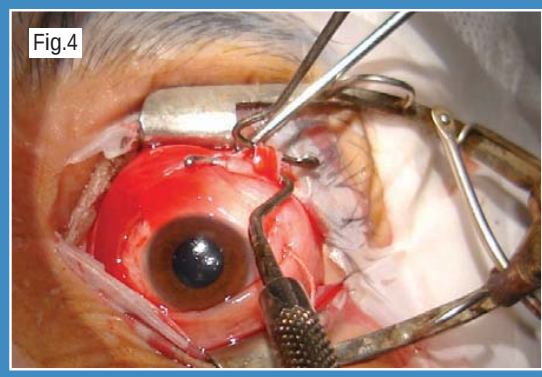
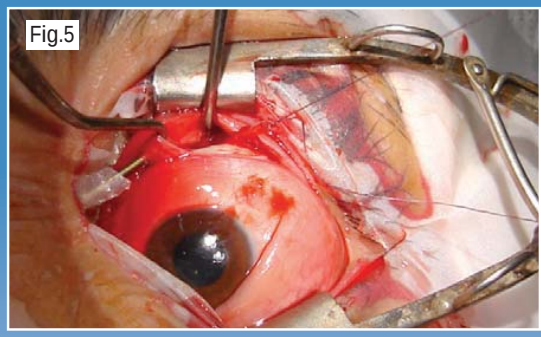
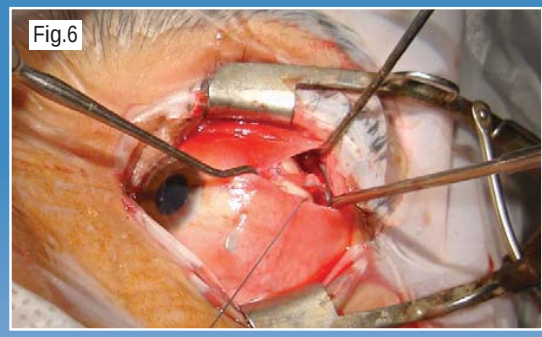


Figure 2: *A case of left sixth nerve paresis for which chemodenervation of the left medial rectus muscle was done using Botulinum toxin.*







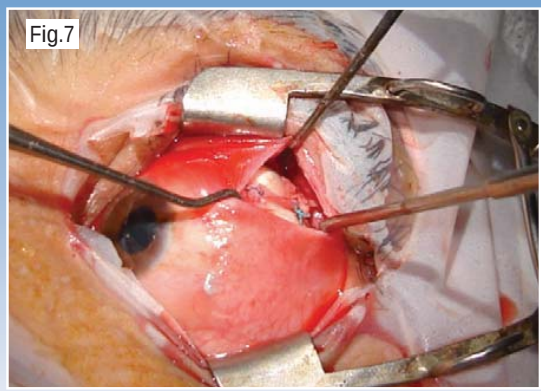


Figure 3: *MR recession (variable) done prior to muscle transposition* ***Figure 4:*** *SR split into half with the muscle hook* ***Figure 5:*** *Split SR disinserted and being transposed towards LR* ***Figure 6:*** *Split half of SR transposed next to LR* ***Figure 7:*** *Split SR transposed alongside the LR with Foster's suture. The same steps are repeated for the inferior rectus which is split and transposed next to LR and augmentation done with Foster's suture*

- Compensatory face turn
- Hess charting shows underaction in the field of LR and overaction of contralateral yoke muscle (MR) [Figure 1b]

Recovery

In a retrospective study of 213 nontraumatic unilateral cases by King et al 78% experienced spontaneous recovery, 73%

having recovered by 24 weeks[1]. In a prospective multicentre study by Holmes in 1998, the overall spontaneous recovery rate in unilateral traumatic sixth nerve palsy cases was found to be 84% and in bilateral cases 38%[2].

Management

The primary aim is to relieve diplopia- patching is effective and also prevents secondary contracture. But sometimes it may lead to vertigo and disorientation. In acute cases, patch the affected eye to overcome diplopia. After few weeks one can patch better eye. Fresnel add on prisms may also be tried.

Immediate management

Chemodenervation – Botulinum toxin may be injected to antagonist of the paralyzed muscle preferably under electromyographic control. The aim is temporary and early alignment to prevent contracture antagonist (Figure 2). Metz et al, found that 70% of patients who refused chemodenervation therapy required surgery, compared with only 10% of those who received the toxin. Kerr et al, concluded that treatment with botulinum toxin did not improve the rate of recovery in children with brain tumours and sixth nerve palsies[3]. Sanjari et al found that the effectiveness of botulinum toxin injection is the same with or without EMG assistance into the medial rectus muscle for treatment of abducens nerve palsy. EMG assistance was found to be associated with more blepharoptosis in their study.

Indications for MRI

- Associated disc edema is present
- Neurological signs / symptoms / deficit
- Increasing symptoms
- Non resolving/ improving in 3 months

Differential diagnosis

- Duane retraction syndrome- Palpabral fissure narrowing on adduction, minimal deviation in 1 gaze and widening on abduction differentiate from a case of sixth nerve palsy.

Surgical Management

Surgical correction for residual deviation should be undertaken only after waiting for atleast 6 months or stabilization of deviation on follow up.

Options

- Weaken antagonist(MR):
  - Recession
- Strengthen under acting muscle(LR):
  - Resection of reacti
  - Tucking for SO
- However no or minimal residual muscle function in paralyzed muscle
- Add force to the paralyzed muscle:
  - Transposition(Vertical Rectus Transposition)
- An Algorithm for surgical management is depicted in (Chart)

Recession- Resection

If the AFGT shows moderate tug of LR, then a recession-resection of the horizontal rectus muscle is done. Small deviations of upto 20 PD are treated with a unilateral LR resection of 5.5 to 8.0 mm. This is invariably combined with a MR recession; an adjustable suture gives better predictability. Surgical steps in VRT (Figure 3 to 7)

Vertical Rectus Transposition

Transposition procedures often are combined with medial rectus muscle weakening, especially when forced duction testing reveals restriction. Medial rectus recession or injection of the medial rectus muscle with botulinum toxin A can be staged or performed at the time of the transposition procedure; however, simultaneous medial rectus weakening raises concerns of anterior segment ischemia, especially in the setting of a full-tendon transposition procedure.

Review of literature on transposition

Vertical rectus transposition (VRT) surgery for the treatment of paralytic strabismus was first described by Hummelshein (1907)[4]. He transposed the lateral halves of the superior and inferior rectus muscles to the lateral rectus insertion as a method to improve abduction in a patient with VI Nerve palsy. Since then, numerous authors have described various modifications of partial tendon transposition procedures to improve abduction[11,13]. Jensen (1964) split the superior and inferior rectus muscles into media land lateral halves and then united them with the upper and lower halves of the lateral rectus muscle in the region of the equator[5]. This concept emerged to avoid anterior segment ischemia which was noted in earlier cases[6]. However, cases of anterior segment ischemia were still reported with this procedure.

Carlson and Jampolsky described an adjustable partial tendon transposition that permitted self-adjustment of the vertical axis of the united temporal halves of the transposed halves of the vertical rectus muscle[7]. This allowed for adjustment of the abducting effect of the transposition. Full tendon VRT was by Schillinger. An adjustable suture technique to correct induced vertical deviations caused by full tendon transpositionwas reported by Laby and Rosenbaum in 1994[9]. Foster (1997) described the modification of posterior augmentationof vertical rectus full tendon transposition using non absorbable sutures to enhance lateralization of each transposed rectus muscle[10]. Lateral augmentation seems to provide maximal transposition force and increase the tonic abducting force.

Leiba et al studied the long-term outcome of full-tendon vertical rectus muscle transposition combined with chemodenervation of the ipsilateral medial rectus muscle for acquired chronic sixth (abducens) nerve palsy and found improved alignment in patients with complete chronic sixth nerve palsy[12-15]. The effects of treatment diminished slightly during the first year after surgery and remained stable thereafter.

Couser (2012) in a study demonstrated that horizontal strabismus due to a weak rectus muscle can be treated with an augmented Hummelsheim procedure, in which both vertical rectus muscle tendons are split, resected by 4 mm, and reattached to the sclera adjacent to the weak rectus muscle[16]. The augmented Hummelsheim procedure combined with medial rectus muscle recession reduced mean primary position esotropia and improved abduction in patients with complete abducens nerve palsy.

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DOS Election

Applications are invited from Delhi Members of **Delhi Ophthalmological Society** for the posts of : ***Vice President*** *(1 Post)*, ***Secretary*** *(1 Post)*, ***Joint Secretary*** *(1 Post)*, ***Treasurer*** *(1 Post)*, ***Editor*** *(1 Post)*, ***Library Officer*** *(1 Post)*, ***& Executive Member*** *(8 Posts)*.

The eligibility criteria for different Posts prescribed in DOS Constitution (1998) will be followed. Application should be submitted on a plain paper duly proposed and seconded by a member of DOS (not in arrears). Application should reach Secretary Office latest by **4th February, 2013** (2 p.m.). Last date of withdrawal is 4th March, 2013 (5 p.m.) Election will be held during the Annual DOS Conference on 14th April, 2013.

Secretary, DOS

DOS Election

If you want to VOTE in the forthcoming DOS Election, Please ensure that your correct address (office and residential) is available at the DOS Secretariat by **4th February, 2013**. You can check & update your address at www.dosonline.org. Outstation members are not permitted to vote in DOS Election.

Secretary, DOS

Life Time Achievement Award

Details of the awards, eligibility criteria and procedure to apply are given below:

General Conditions

1. Any Member of the Society who is eligible for the Award shall be entitled to be considered for the same.
2. Nomination should be signed by one of the following:

a. Any of the Past Awardees
b. Any of the Past Presidents
c. At least 5 members of the Executive Committee
d. At least 15 members of the Delhi Members of DOS.

3. Recommendations should be sent to the Secretariat, DOS with 5 copies of BIO-DATA and Photograph.
4. The person shoud have significant Life time achievements in the field of Ophthalmology.
5. Recipient of the Award shall be selected and recommended by the Selection Committee, which has to be approved by the executive.

Eligibility

1. The Member should be 65 years of age or more
2. Active participation in Society for 20 years
3. Contribution in improvement of standard of Ophthalmology in India
4. Award will carry a citation.

Periodicity

1. Maximum 2 Awards in a year.
2. The nominations must be received in DOS Secretariat no later than **5.00 p.m. on 5th February, 2013.**

Secretary, DOS

Low Vision In Children

Pradeep Agarwal

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Blindness and low vision are major causes of morbidity and have profound effects on quality of life for many children. Frustration, guilt and confusion among the parents accompany the birth of a visually impaired child. However, the development of a visually impaired child is similar to that of a sighted child except the process is slower. The later the onset of visual impairment, the more normal is the child's development because of the acquisition of visual memory in the intervening period. According to Barraga, visual functioning is a learned behavior, "primarily development" the more visual experience the child has, the more the pathways to the brain are stimulated, which leads to a greater accumulation of a variety of visual images and memories. Hence it is imperative that early intervention is offered to visually impaired children. The goal of early intervention is to assist the family in their process of restoring balance.

In 1992, the World Health Organization (WHO) published a working definition of low vision: "A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task for which vision is essential."

Functionally, Anne Corn, in 1989, defined low vision as a level of vision that with standard correction hinders an individual in the planning and/or execution of a task, but which permits enhancement of the functional vision through the use of optical or non-optical devices, environmental modification and/or techniques.

There is now an increasing acceptance of a behavioural function rather than a medical basis for low vision. However, children in developing countries are rarely encouraged to develop the use of residual vision and its existence is often ignored by medical and education staff. The challenge for us is to recognize ways which allow partially sighted children to benefit from their residual vision through the provision of appropriate services, materials and devices. Many children with low vision can perform better than their parents expect and have the same quality of life as any other child, provided that their treatment follows these steps, and in this order:

- Examination to establish the cause of visual loss
- Surgical interventions where appropriate (such as cataract surgery)
- Assessment of the child's various visual functions (distance vision, near vision, contrast sensitivity, and visual field)
- Accurate refraction and provision of spectacles
- Assessment for and prescription of low vision devices, such as magnifiers
- Suggestions for non-optical low vision devices such as reading stands or reading slits
- Educational support and training in the use of low vision devices (with follow-up).

Goals of Low Vision Evaluation

The objectives of a low vision evaluation are to:

- Determine the extent of functional vision and thereby provide an accurate description of the child's ability to use it; and
- Provide low vision devices in order to increase the child's functioning capacity.

Low Vision Assessment

A low vision assessment should follow a structured approach that consists of the following:

Figure 1: *Monocular Hand held Telescope for Classroom Board Work*

Figure 2: *TV Spectacle for TV Viewing*

Figure 3: *Hand held Magnifier for Reading*

- History-Preferably from immediate caregiver (usually the parents) or a person who knows best about the visually impaired child.
- Visual Acuity – Distance and Near

Visual acuity measurement provides two important pieces of information. First, it provides a baseline measurement from which the amount of magnification needed and improvement in acuity can be determined. Second, it helps the practitioner to educate the parents and teachers of the visually impaired child about the child's visual abilities and limitations. Usually the near acuity is better than the corresponding distance acuity in children. This is because of the availability of ample accommodation in the younger age group. These children will be able to read by just pushing the reading material close to their face.

Refraction

IT is not uncommon to overlook large refractive errors in children. Reports from West Africa indicated that at Least 30% of children with low vision need spectacles. A study

Figure 4: *Mouse Model CCTV for Reading Work*

conducted on 220 children from an urban tertiary eye center, South Indian Demonstrated that correction of ametropia with spectacles was the most common treatment (30%) provided to low vision children. The importance of accurate refraction is illustrated by Van Dijik K in his study of low vision programmes undertaken in Asia[7]. Among the children aged 4-15 years unrolled in these programmes, more than two-third could achieve a distance visual acuity of 6/60 or better after receiving the correct spectacles. For many children, this level of vision is sufficient to allow them to read a blackboard from the front row in a classroom; these children generally only require minimal additional support.

Visual fields

The purpose of visual field examination is know if there are any field losses and if they are significant enough to affect the child's mobility and performance with the prescribed low vision devices. In case of severe peripheral field loss, the child will need to given mobility or vision efficiency training. In case visual field examination is not feasible, information about the child's navigational abilities in familiar as well as unfamiliar could prove useful.

Illumination

Children with ocular disorders such as oculutaneous albinism and cone dystrophy are usually light intolerant. As result of this, will have to be restricted to indoor environment and may not be able to enjoy outdoor play activities. In these cases, light-controlling devices would prove useful[9].

Contrast sensitivity

Contrast sensitivity is affected in most of the ocular disorders. In such case, contrast enhancing measures include use of bold-line notebook, black felt-tip pens in school-going children[4]. In case of infants, a child who does not give a social smile is considered to be unresponsive[10].

Management

The management of visually impaired child with vision includes the provision of the following;

- Accurate refractive correction
- Low Vision Devices-Distance

If the child has problems with distance vision tasks such as chalkboard work despite refractive correction and appropriate environmental modifications such as sitting in

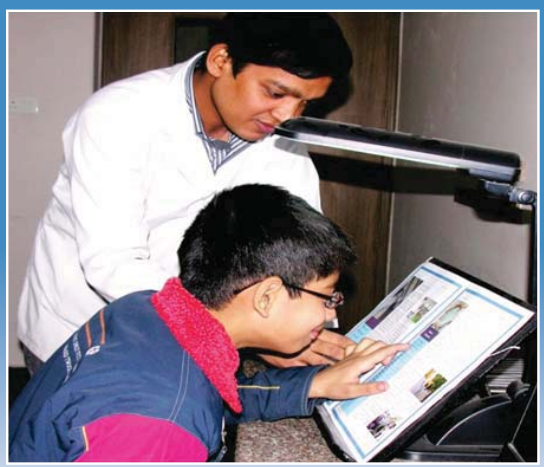

Figure 5: *Reading Stand with Over-head Table lamp for Postural Maintenance*

the first row, telescopes are recommended. These Telescopes could be either hand-held or spectacle mounted. Usually 4X magnification is the best option in telescopes that is a balance between adequate magnification and field of views[11]. Apart from the cost, the appearance of these telescopes is a major barrier to their acceptance.

Since near vision tasks are usually not problematic for children, they may not most often need any low vision device for near. The Examiner should dispel any myth with regard to reduced reading distances. In case children have problems with seeing fine print such as maps, dictionary etc. low-powered hand or pocket magnifiers (2x -3X) could be beneficial. Non-optical devices such as reading stand to improve comfort in case of postural problems due to reduced reading distance can be recommended.

Reading lamps with fluorescent tube light to improve to improve contrast should be suggested.

Other non-optical devices include sun filters, peaked caps, photo brown photo chromic lenses, bold-link notebooks, black left-tip pens etc.

Apart from provision of low vision device, training in use of these devices is crucial[8]. Structured training programs in the use of low vision devices should be planned and discussed with the child and parents. The training should be appropriate to the recommended devices. The low vision devices should be dispensed only after the child has demonstrated proficiency in their use. The low vision specialist should also provide details evaluation report to the teacher so that the teacher can assist the child with the use of low vision devices in the classroom. Teacher of visually impaired children are in a prime position to liaise between the low vision clinic, home and school[12].

In summary, low vision rehabilitation in children is rewarding for the parents, the practitioner and the child. Children with low vision are visually rehabilitated best using a multi-disciplinary approach consisting of teachers of visually impaired children, orientation and mobility instructors, low vision specialists, and parents. If the treating ophthalmologist cannot provide these rehabilitative services, it is mandatory that he/she refers these children to the appropriate professionals who can help these children.

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Choroidal Hemangioma

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Circumscribed choroidal hemangioma is an uncommon, benign vascular tumor manifesting as an orange-red mass in the posterior pole of the eye. Serous retinal detachment accounts for decreased vision in most patients. Diagnosis of this tumor is challenging and many patients are initially misdiagnosed with choroidal melanoma or metastasis. Several ancillary tests such as ultrasonography, fluorescein angiography, indocyanine green angiography, and magnetic resonance imaging help differentiate this tumor from other simulating lesions. Asymptomatic lesions should be observed, but visually threatening or visually impairing lesions require treatment. Photodynamic therapy, laser photocoagulation, and transpupillary thermotherapy may be used for primary management of this tumor. Patients who fail to respond to previous treatment or those with extensive serous retinal detachment can be treated using radiotherapeutic modalities.

Introduction

Choroidal hemangioma is an uncommon benign vascular tumor of the choroid that can be circumscribed or diffuse. Circumscribed choroidal hemangiomas are usually diagnosed between the second to fourth decade of life when they cause visual disturbances owing to the development of an exudative retinal detachment. Circumscribed tumors occur sporadically, without any associated local or systemic anomalies. In contrast, diffuse choroidal hemangiomas are usually evident at birth and generally occur as a part of neuro-oculo-cutaneous hemangiomatosis (Sturge-Weber syndrome).

Clinical Features

Circumscribed choroidal hemangioma usually appears as a discrete, round, orange-red tumor, similar in appearance to the adjacent surrounding choroid. A pigmented rim, possibly secondary to compression of adjacent choroid or elevation of the retinal pigment epithelium (RPE), often surrounds the tumor. Almost all cases occur posterior to the equator, usually near and temporal to the optic disc. Flecks of pigment, splotchy yellow material, or orange pigment may be present over the surface of the tumour. Almost half of all tumours are of medium size. Solitary tumours are the rule; an eye containing more than one choroidal hemangioma is extremely rare.

	Basal Diameter	Thickness
Small	5 mm	2mm
Medium	5mm - 10mm	2mm - 3mm
Large	>10mm	>3mm

Although choroidal hemangiomas are vascular tumors, prominent intrinsic tumor vessels or feeder vessels are not seen ophthalmoscopically. Subretinal fluid from the tumor leading to an exudative retinal detachment is generally present in symptomatic cases.

Macular changes are frequent. They include hard exudates, retinal pigment epithelial changes, macular pucker or epiretinal membrane formation and chronic cystic changes. Thickening and cystic changes of the retina over the tumour itself are common. The tumors are amelanotic and transilluminate easily.

This benign tumor can cause visual impairment by various mechanisms, such as exudative retinal detachment, overlying photoreceptor degeneration, elevation or tilting of the macular region, cystoid macular edema, subretinal fibrosis, RPE alterations, and retinoschisis.

Differential Diagnosis

- Amelanotic choroidal melanoma

They will show typical ultrasonographic findings of acoustic hollowing, orbital shadowing and choroidal excavation as compared to hemagioma lesions which are acoustically solid

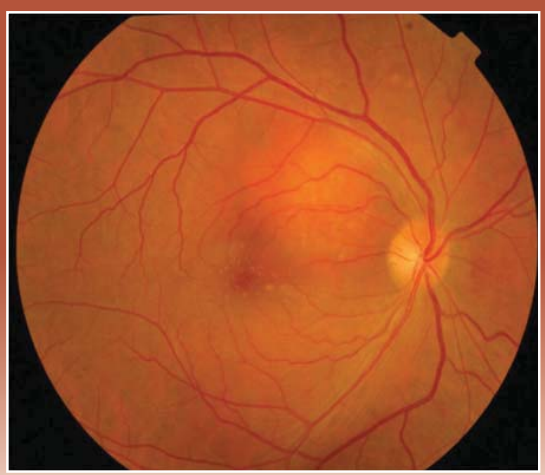

Figure 1

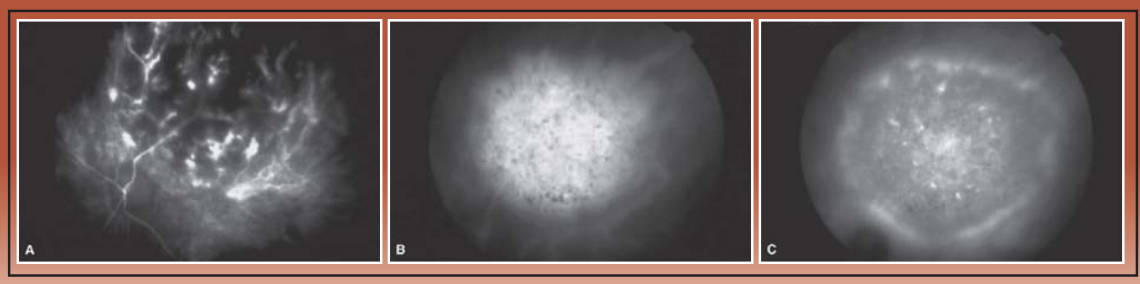

Figure 2: *A) Reticular hyperfluorescence is visible 20 seconds after injection. B) Diffuse, intense hyperfluorescence (C) minutes after injection; annular hyperfluorescence*

and have high internal reflectivity. In contrast to choroidal melanomas, choroidal hemangiomas almost never attain a mushroom-shaped appearance

- Metastatic choroidal tumor

Choroidal metastasis appears as a creamy yellow plateau or elevated mass and in contrast to choroidal hemangioma, which is almost always solitary and unilateral, may commonly be multifocal or bilateral.

- Choroidal osteoma
- Central serous chorioretinopathy
- Posterior scleritis
- Choroidal granuloma.

Pathology

Choroidal hemangiomas are vascular hamartomas that are probably congenital. Their growth and development are very likely related to the development of the choroid.

Hemangiomas of the choroid are classified histopathologically according to the prevailing type or types of vessels within the tumour: capillary, cavernous, or mixed. The capillary type is composed of small vessels separated by loose connective tissue, where as the cavernous type is composed of larger vessels separated by loose connective tissue. The mixed type shows both capillary and cavernous features.

Histopathological studies demonstrate that the orange or orange-yellow spots over the surface of these tumours are due to lipofuscin.

Investigations

Fluorescein Angiography

- Choroidal phase- irregular hyperfluorescence of the choroidal vessels.
- Arteriovenous phase-fluorescence increases.mottled apperance becomes confluence.
- Late phase-multiloculated accumulation of dye in the outer retina.
- Zone of hypofluorescence at the margins of the tumour in the early and middle phases.

Indocyanine Green Angiography

The intrinsic vascular pattern of a choroidal hemangioma is better observed with ICG angiography within 30 seconds of ICG dye injection, the intrinsic tumor vascular pattern is visualized. There is a rapid progression of hyperfluorescence, which peaks around 3 to 4 minutes. In the late phase of the ICG angiogram, a ''washout'' effect with reduction of the initial hyperfluorescence is observed owing to egress of dye from the hemangioma.

Hemangiomas are better documented on ICG

Ultrasonography

- B SCAN-elevated,with acoustic solidarity throughout the tumour.
- A SCAN-high initial spike,also high internal reflectivity.
- No spontaneous vascular movements.

Optical Coherence Tomography

Used to evaluate secondary retinal morphologic changes, such as shallow subretinal fluid or cystoid macular edema.

P-32 Test

This test has become unpopular in recent years. As in many benign tumours, if a positive result is considered 100% or greater uptake, the P-32 test in a patient with choroidal hemangioma will generally be negative. The average uptake for choroidal hemagioma is approximately 20%.

Neuroimaging

CT SCAN - Tumour enhances moderately with contrast material.

MRI-Shows tumour to be hyperintense to the vitreous in T1 weighted images and isotense in T2 images.

Others

- In Vivo Phosphorous - 31 Magnetic Resonance Spectroscopy
- Color Doppler Imaging
- Confocal Laser Scanning Fluorescence Topography

Treatment Modalities

Decision to treat a circumscribed choroidal hemangioma should be individualized based on the extent of symptoms, the loss of vision, and the potential for visual recovery.

Aim-to induce sufficient tumor atrophy with resolution of subretinal fluid and tumor-induced foveal distortion without destroying the function of the overlying retina.

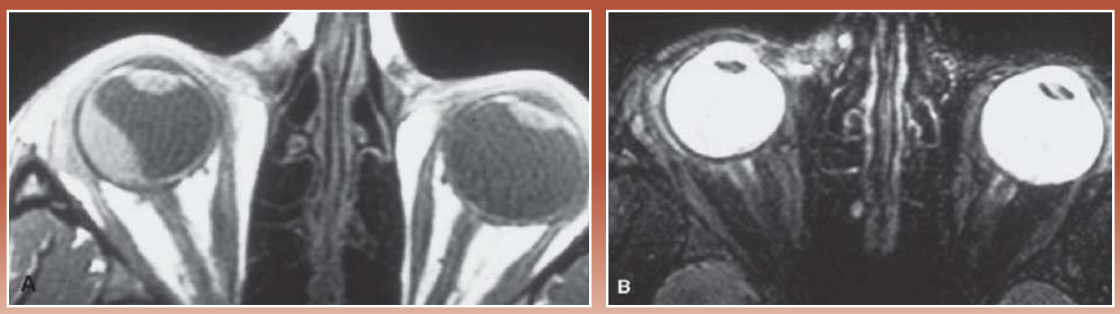

Figure 3: *(A) On T1 - weighted image with gadolinium enhancement, the hemangioma is distinctly hyperintense compared with the vitreous. (B) On T2- weighted image, the tumor is almost indistinguishable from the vitreous*

Laser photocoagulation

Although laser photocoagulation does not induce significant tumor regression, it can induce the resolution of subretinal fluid. Nevertheless the recurrence of subretinal fluid necessitated additional treatment in as many as 40% of cases

Damage to the overlying retina can be minimized by using a diode laser because of a deeper penetration by the infrared wavelength.

- Not used in subfoveal CCH because of the poor visual prognosis.
- It should also not be used in CCH associated with extensive overlying subretinal fluid.
- Does not induce significant tumor regression , but it can induce the resolution of subretinal fluid.

Photodynamic Therapy

Verteporfin PDT of circumscribed choroidal haemangioma is effective in inducing tumour regression in almost all cases and improving or stabilising vision in the majority of patients as it can offer site specific tumor destruction while sparing the overlying retina and retinal vasculature

In general, the tumour regression is most dramatic following the first session of PDT and is evident within 3 months. Additional PDT may be considered after 3 months if the tumour or subretinal fluid persists. The recommended parameters are based on studies of choroidal neovascular membranes treated by PDT. There is significant potential for choroidal atrophy following PDT.

Transpupillary Thermotherapy

To avoid the limitations of laser photocoagulation and the complications of radiotherapy, transpupillary thermotherapy has been used to treat choroidal hemangiomas. Complete or partial regression of the hemangioma in more than 90% of cases with a corresponding improvement of vision in most cases can be expected when they are treated with transpupillary thermotherapy; however, visually significant complications such as cystoids macular edema, preretinal fibrosis and retinal vascular occlusion can occur.

Indications

- Anterior tumor margin posterior to the equator of the eye.
- Largest tumor base 10 mm, tumor thickness 4 mm
- Shallow subretinal fluid overlying the tumor
- Lesions which are not subfoveal or juxtapapillary

Radiation Therapy

- Episclera plaque radiotherapy
- External beam irradiation
- Stereotactic therapy
- Proton beam irradiation

Used in:

- Extensive bullous retinal detachment..
- Subfoveal tumour
- Tumours resistant to other forms of treatment.

Episcleral Plaque Radiotherapy

- radioactive plaque is placed over the tumor
- Cobalt-60, Iodine-125 or Ruthenium-106
- apex dose of 50 Gy.

External Beam Radiotherapy

- A total dose of 12–24 Gy in 10 fractions is given.
- External beam radiotherapy delivered with precision using stereotactic techniques may be superior to other methods of radiation treatment.

Proton Beam Radiotherapy

- Homogenous dose of radiation to the entire tumor while sparing surrounding structures.
- Protons induce most tissue damage at the tumor level where they slow down (Bragg peak) with relative sparing of the superficial tissues.
- Dose of 30 Cobalt-Gray-Equivalent (CGE)

Side Effects of Radiation

- Proton beam radiotherapy and stereotactic irradiation are expensive and are not widely available.
- Episcleral plaque radiotherapy requires two operations.
- Radiation side effects such as cataract and retinopathy

Points regarding treatment of circumscribed choroidal hemangioma

- Asymptomatic tumors need only periodic observation.
- Laser photocoagulation, despite initial good response, may be associated with a considerable recurrence rate.
- Both laser photocoagulation and transpupillary thermotherapy can be visually destructive and should be limited to treatment of extrafoveal hemangiomas
- Photodynamic therapy is an effective new modality and can be used for both foveal and extrafoveal hemangiomas. The long-term results of this treatment modality are not yet known.
- Radiotherapeutic methods should be considered for cases that have failed previous treatment or are not good candidates for other treatment modalities because of subfoveal location or extensive subretinal fluid.

Recent Advances

Intravitreal avastin can also be used in the treatment of choroidal hemangioma.

- Primary treatment modality, especially for subfoveal lesions.
- Reduce fluid height as to make laser, TTT and other modalities easier.

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Irvine-Gass Syndrome

Khushboo Doctor

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A 64 year old male came with complaints of decreased visual acuity in right eye for 3 months after uneventful cataract extraction. Systemic history was unremarkable. Visual acuity in RE 6/36 & LE 6/9. Slit lamp biomicroscopic examination revealed loss of foveal reflex in right eye. OCT revealed a neurosensory detachment at fovea with loss of foveal depression & cystic spaces around the fovea with CFT (Central Foveal Thickness) 581 microns. Fluorescein angiography revealed perifoveal leakage in a petalloid pattern & late optic disc hyperfluorescence.

Patient was treated with intravitreal Triamcinolone 4mg (0.1 ml) & given Nepafenac 0.1% eye drop 3 times per day.6 weeks later VA improved to 6/9 with resolution of CME clinically & CFT reduced to 235 microm & IOP was normal.

Discussion

Irvine-Gass Syndrome also known as Pseudophakic macular edema is a common complication after cataract surgery. It presents 6 to 10 weeks after cataract surgery.

In 1953, Irvine described cystoid macular edema that specifically occured after intracapsular cataract extraction (ICCE)[1]. Dr. J. Donald Gass subsequently described CME (Cystoid Macular Edema) with FFA findings. So it is called Irvine-Gass Syndrome.

No large scale, randomized trials have established the best modality of treatment yet.

Incidence

- Angiographic CME after ICCE as high as 60%[2]
- Angiographic CME after ECCE 15% to 30%[2]
- Clinical CME after SICS & Phacoemulsification 0.1% to 2.35%[3,4]
- OCT evidence of CME after SICS & Phacoemulsification 4%[5] to 11%[6] but also reported to be as high as 41%[7]

The incidence of CME increases with significant postoperative uveitis & with surgical complications such as vitreous loss or iris prolapse. Increased incidence may be related to IOL complications & photic effects as well[8].

Pathogenesis

Prostaglandin mediated inflammation leading to breach in BRB (Blood retinal Barrier) leads to increased vascular permeability & mechanical traction exerted on vitreomacular interface by vitreous incarceration are 2 different mechanisms in development of CME.

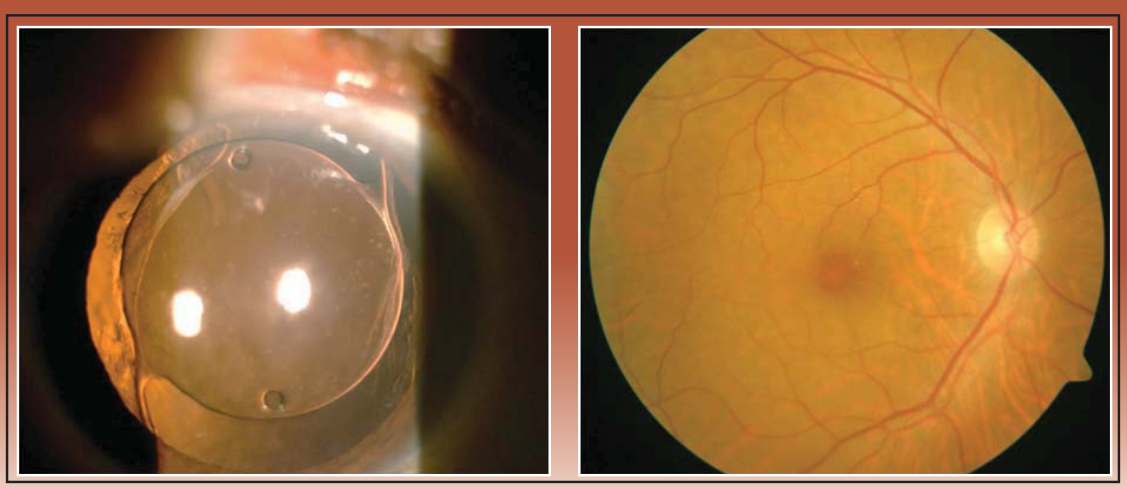

Figure 1: *Pseudophakic Cystoid Macular Edema demonstrating loss of foveal contour*

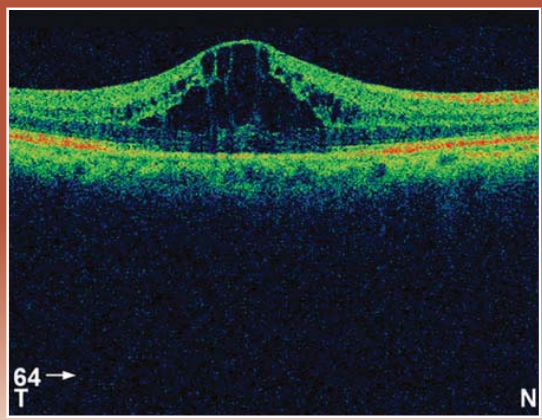

Figure 2: *2 Cystoid Macular Edema on OCT*

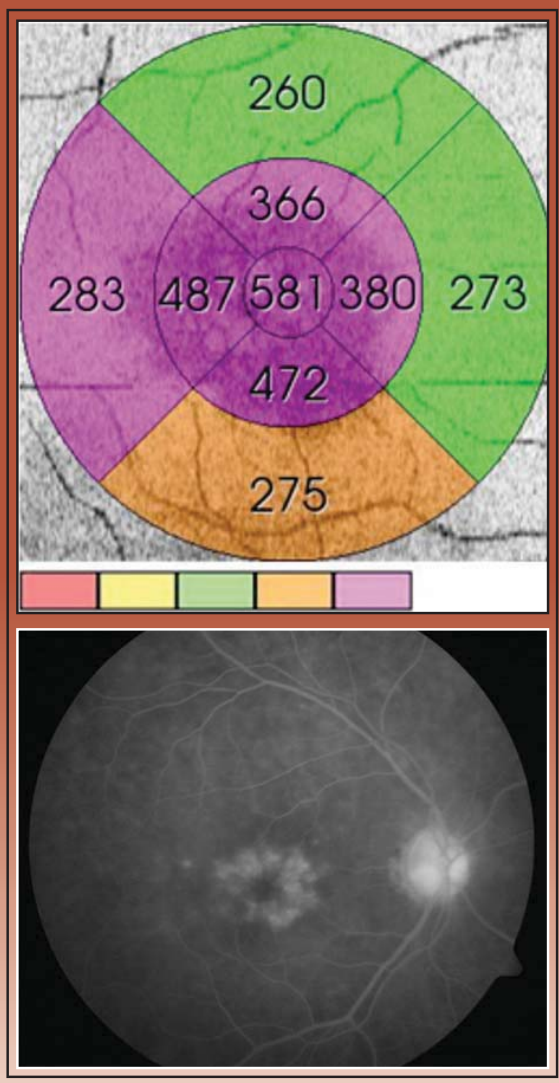

Figure 3: *FFA demonstrating typical Petalloid appearance of dye leakage & late optic disc hyperfluorescence*

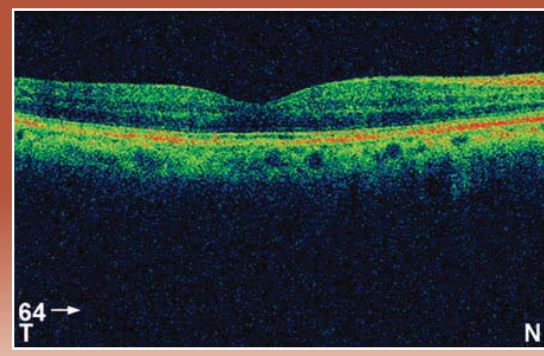

Figure 4: *OCT shows normal foveal contour 6 wks after IV TA*

Irvine-Gass Vs DME[12]		
	IGS	**DME**
Microaneurysms\ Hemorrhages	No	Common
Exudates	Only if chronic	Common
FA pattern of leakage	Petalloid appearance	Focal\ Diffuse
Late Optic Disc Hyperfluorescence	Common	No (Except NVD)

Clinical Pearls

- Visual Acuity may range from 20/25 to 20/400 depending on the severity of edema.
- Hyperopic refractive shift
- OCT

It is an important tool in the diagnosis of CME since it can detect even slightest increase in retinal thickness not detectable by human eye.

OCT findings include a diffuse increase in retinal thickness & cysts located mainly in inner nuclear & outer plexiform layers[9].

- FFA

'Angiographic CME' is defined as typical foveal petalloid leaks of fluorescein along with late optic disc hyperfluorescence.

Why Petalloid Pattern?

Fluid collects in the loosely arranged outer plexiform layer of Henle, the fibres of which are arraged horizontally. This produces a petalloid pattern on FFA.

With Red-free light, a honeycombed appearance corresponding to fluid-filled cysts. These cysts may coalesce into a macular cyst then form a hole by deroofing.

Management

Curative therapy includes topical corticosteroids, topical non-steroidal anti-inflammatory agents, oral acetazolamide, posterior subtenon or intravitreal triamcinolone[10]. Most cases of post-op CME are mild & typically managed using a combination of topical steroid & non-steroidal anti-inflammatory agent over at least 6 weeks to 3 months[11], although evidence behind this is actually quite poor. The effort to move fluid from the retina through choroid requires

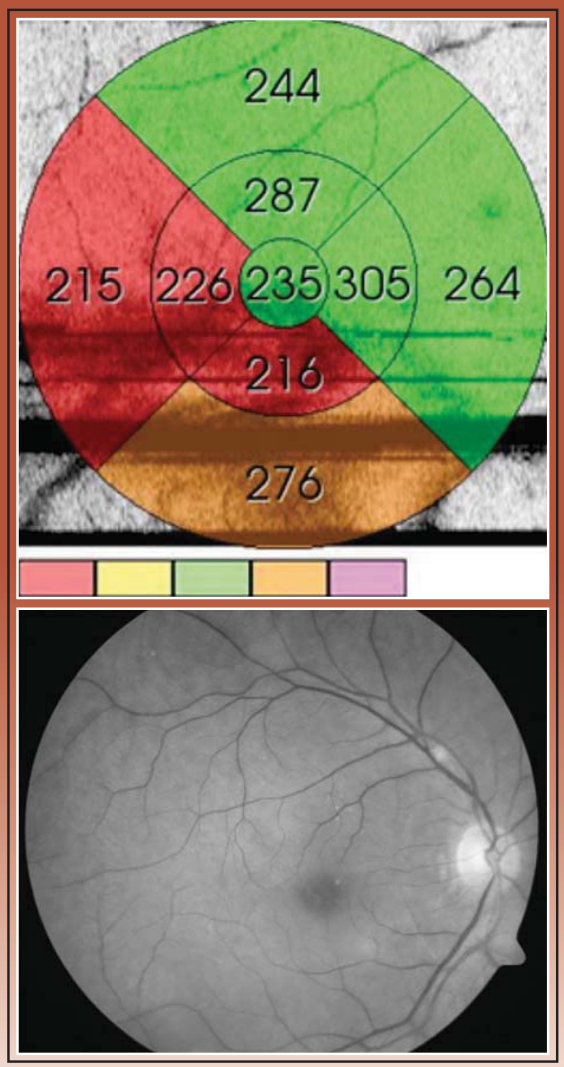

Figure 5: *Red-free image 6 weeks after IV Triamcinolone injection*

transport of fluid ions by RPE. Studies have shown that Acetazolamide use results in small but statistically significant decrease in CME but does not improve vision. Persistent edema may warrant subtenon or intravitreal triamcinolone acetonide. PPV is treatment of choice when ERM or VMT is present[10].

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Eyelid Retraction and its Management

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Eyelid retraction is a functional and cosmetic disease process that poses a threat to vision and can be psychologically debilitating to patients. Eyelid retraction increases the vertical height of the palpebral fissure, thereby causing poor coaptation of lids and hence lagophthalmos thus leading to exposure keratopathy..

The causes of eyelid retraction in the patients can be categorized into a tripartite simplification of Frueh's system, namely neurogenic, myogenic, and mechanistic.

Comments on selected entities follow.

Neurogenic Eyelid Retraction

Eyelid retraction can be congenital or acquired. Two common causes of constant lid retraction, are (1) thyroid eye disease, and (2) Parinaud's syndrome

Eyelid retraction can occur due to loss of supranuclear control of levator inhibition in lesions of nondominant cerebral hemisphere and coma,

In facial nerve dysfunction, the lower lid sags on the affected side due to paralysis of orbicularis oculi which closes the eyelids and zygomaticus muscles, which elevate the cheeks as well as the corrugator supercilii and procerus muscles, which depress the eyebrow. Lower eyelid retraction occurs because of the unopposed effects of gravity and lower eyelid retractor contraction.

The etiology of facial nerve dysfunction can be:

- Trauma along its course such as fracture base of skull involving petrous part of temporal bone.
- Cerebrovascular accidents involving anterior inferior cerebellar artery causing ischemic damage just proximal to the geniculate ganglion.
- Bell's palsy thought to be associated with an acute viral infection or reactivation of herpes simplex virus.
- Acoustic neuromas in the cerebellopontine angle tumors
- Infectious, immune-mediated causes such as Lyme disease, Chickenpox, Mumps, Polio, Guillain-Barré syndrome, Leprosy, Diphtheria and Botulism
- Möbius' syndrome-A rare, congenital condition characterized by bilateral sixth and seventh cranial nerve palsies, motility disturbances, limb anomalies and orofacial defects

Myogenic Eyelid Retraction

Myogenic eyelid retraction can be congenital or acquired.

Congenitally, can occur due to fibrosis resulting from an intrauterine infection or periorbital inflammation or due to dense medial and lateral horns of the levator palpebrae superioris aponeurosis at the level of Whitnall's ligament and congenital extraocular muscle fibrosis

The acquired causes may include protractor (i.e.orbicularis oculi) weakness as in various periocular myopathies including Myasthenia Gravis, Myotonic Dystrophy, and Chronic Progressive External Ophthalmoplegia.

Table
Scleral Spacer Graft In Eyelid Retraction

Here we are discussing sclera spacer grafting elaborately to tackle eyelid retraction	
Upper eyelid spacer: surgical step	**Lower eyelid spacer: surgical steps**
Upper lid Skin incision	Conjunctival incision
Identification and dissection of Levator muscle	Identification, dissection and disinsertion of lower lid retractors
Disinsertion of levator muscle	Placement of sclera spacer graft
Transection of medial and lateral horns of levator muscle	Suturing the spacer to lower lid retractors
Placement of scleral spacer graft	Suturing the spacer to inferior border to tarsal plate
Suturing spacer to tarsal plate	
Suturing spacer to levator muscle	
Skin closure	

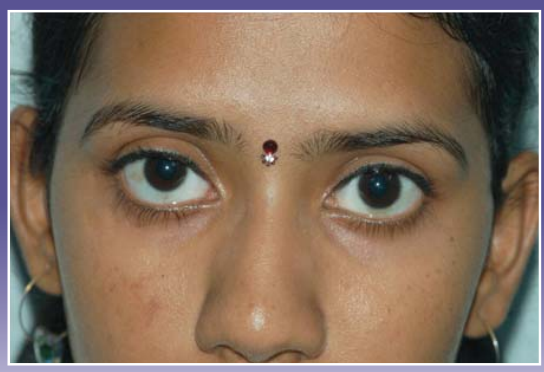

Figure 1: *Pre-op lower lid retraction*

Figure 2: *Post-op lower lid spacer*

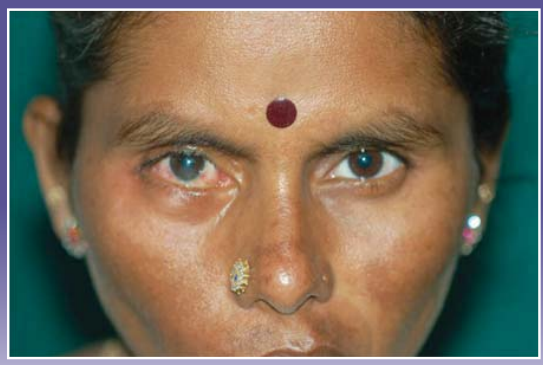

Figure 3: *Pre-op paralytic ectropion*

Figure 4: *Post-op lower lid spacer with lateral tarsal strip*

Mechanical Eyelid Retraction

Mechanical causes of eyelid retraction include prominence of the globe, such as may occur with severe myopia, buphthalmos, proptosis, retrobulbar hemorrhage, craniosynostosis. Cutaneous scarring from eyelid neoplasms, herpes zoster ophthalmicus, smallpox, atopic dermatitis, scleroderma, or burns can cause eyelid retraction from inadequacy of the vertical dimension of upper and lower eyelid skin . Blowout fractures of the orbital floor may cause upper eyelid retraction on either a neurogenic or a mechanical basis. Hypotropia of the globe can stimulate increased innervation to the superior rectus and levator palpebrae superioris muscles that elevates the upper lid mechanically.

Eyelid retraction can occur due to overcorrection in ptosis surgery due to vertical shortening of levator muscle i.e. "middle lamella" which thus results in upper lid retraction and lagophthalmos.

Symblepharon between the bulbar and palpebral conjunctiva may also limit downward excursion of the upper eyelid and cause eyelid retraction

In thyroid-related orbitopathy, inflammatory fibrosis of Müller's muscle, abnormal sympathetic tone in Müller's muscle, proptosis, contracture of the inferior rectus muscle with superior rectus hyperactivity, and overmedication with thyroid replacement cause retraction.

Eyelid retraction due to neurogenic, myogenic, mechanical or spastic etiology leads to lagophthalmos due to poor coaptation of the eyelids during attemped closure thus leading to exposure keratopathy.

Management of Eyelid Retraction

Maintenance of a moist ocular surface is critical. Regardless of etiology, initial symptomatic treatment is directed toward increasing ocular surface lubrication and decreasing evaporative drying.

Lubricating eyedrops, ointment, moisture Shields, tarsorrhaphy are beneficial during acute phase.

The main aim of treatment is to reduce the incidence of corneal exposure keratopathy and achieve good coaptation of lids.

- Medical Treatment and Supportive Care for Corneal Exposure. Includes surface lubricants in form of drops,ointments or gel.
- Tarsorrhaphy temporary or permanent can reduce corneal exposure.
- Eyelid surgery is beneficial when acute phase of the disease process has resolved and amount of retraction has stabilized.

Definitive treatment of lagophthalmos depends on accurate diagnosis of the underlying cause

- Eyelid Retraction Due to Abnormal Globe Protrusion

Patients with proptosis are usually managed best by orbital decompression and repositioning of the globes within the orbit.

- Eyelid Retraction Due to Inadequate Vertical Skin requires anterior lamellar replacement with skin flaps or grafts. Eyelid retraction due to a tight middle lamella that resists complete closure requires recession of the eyelid retractors. Lid lengthening procedures, either by releasing Müllers muscle or the levator aponeurosis, may increase the vertical excursion. Surgeons vary in their use of spacers or simple retractor recession in the upper eyelid. In the lower lid, recessing of the retractors is usually performed in combination with placement of a spacer to counteract the effect of gravity.
- Eyelid Retraction Due to Lid-Globe Adhesion by symblepharon must be treated by releasing the symblepharon and reconstructing the appropriate fornix by placing a fornix deepening suture with mucous membrane grafting.
- Upper Eyelid Retraction in TRO

A number of surgical procedures have been described to correct eyelid retraction.

- Levator Recession.
- Tarsotomy
- Superior tarsal muscle(Muller's) excision
- Levator marginal myotomy

- Lagophthalmos Due to Facial Nerve Dysfunction.

Various options available include:

- *Facial Reanimation Techniques*- including primary facial nerve repair, cross-facial nerve grafting, hypoglossal facial nerve transfer, temporalis muscle transfer, and free innervative muscle transfer
- *Mechanical Aids*-Various mechanical aids used are eyelid weights, palpebral springs, silastic bands, and permanent eyelid magnets.

  Gold weight implantation. Gold weights range from 0.6 to 1.6 g and come in 0.2-g increments. The material consists of 99.9% pure 24 karat gold. It is sutured to the tarsus with 7-0 nylon sutures after exposure through an upper eyelid crease incision. However, astigmatic shift as well as migration and/or extrusion of the gold weight may occur.
- Lower eyelid tightening and elevation. Laxity of the lower eyelid may occur in conditions such as facial nerve palsy due to paralytic ectropion. Patients with paralytic ectropion were historically managed by horizontal tightening. A tightening procedure such as a lateral tarsal strip will improve apposition of the lower eyelid to the globe and decrease tearing.

Patients who continue to have exposure of the cornea despite medical therapy and upper eyelid restructuring may benefit from lower eyelid elevation. Patients with paralytic lower lid laxity and ectropion are best managed by placing a spacer interposed posteriorly between the tarsus and lid retractors to elevate and support the lid. Here, the lower eyelid retractor muscles may be recessed from their insertion on the inferior tarsal border. An additional spacer graft may be sutured to the tarsal plate to achieve further elevation. Banked sclera, autologous ear cartilage, nasal cartilage, polytetrafluorethylene (Gore-tex) or hard palate mucosa grafts have been used. In cases with a cicatricial component, a full-thickness skin graft and/or collagen or mucous membrane graft have been used. Horizontal tightening is also performed if there is significant laxity of the lid.

Advantages

- Readily Available From Eyebanks,
- Good Strength, Can Be Easily Cut To Size
- Gives Predictable Lid Height
- Has A Curved Contour,
- Is Easy To Structure,
- Does Not Contract Significantly In The Post-Operative Period

Complications

One might come across following complications in this technique.

Operative

- Button holing of LPS
- Inadequate graft size
- Haemorrhage
- Button holing of tarsus
- Inadvertent injury to cornea

Post-Operative

Early

- Edema
- Ptosis
- Inadequate correction
- Chemosis of conjunctiva

Late

- Thickened eyelid
- Loss of lashes
- Dry eye
- Extrusion of graft
- Recurrence of retraction
- Fibrosis of lacrimal gland in repeated procedures
- Resorption
- Shrinkage
- Persistent retraction
- Cysts
- Corneal Damage -irritation, erosion
- Infection
- Graft Exposure

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Management of Refractory Glaucoma

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Refractory glaucoma is defined as uncontrolled IOP (> 21 mm Hg) despite maximal antiglaucoma medication in previously failed surgical treatment. Glaucomas that are more likely to become refractory includes neovascular, inflammatory, post-retinal surgery, post-penetrating keratoplasty glaucoma, posttraumatic, post uveitic and rare conditions like aniridia and congenital anterior chamber anomalies. Refractory Glaucomas also include patients having failed trabeculectomy, patients with extensive conjunctival scarring,and patients with aphakia or pseudophakia.

Multiple factors contribute to the failure of intraocular pressure control during glaucoma management. Management of refractory glaucoma is a big challenge for ophthalmologists. Medical treatment is usually inadequate and quite frustrating. Most of these patients will ultimately require surgical treatment. Availability of a number of surgical options itself indicate that there is no single effective surgical procedure. Trabeculectomy alone without adjuvants or any modifications is more likely to fail due to fibrosis. So, various modifications like use of releasable suture and adjuvants like mitomicin C & 5- Florouracil have been tried in literature with variable success. In addition to Trabeculectomy,we have surgical procedures like Glaucoma Drainage Devices and Cyclodestructive procedures.

Following are the surgical options for management of refractory glaucoma

- Trabeculectomy and its Modifications
  - Trabeculectomy with Releasable sutures
  - Trabeculectomy with antifibrotic agents
  - Trabeculectomy with ologen implant
- Glaucoma Drainage Devices
- Cyclodestructive surgery

Trabeculectomy with Releasable suture

Over the past 25 years trabeulectomy is the most commonly performed drainage operation for glaucoma, primarily because it produces fewer postoperative complications than any of the full-thickness filtering procedures. During trabeculectomy the surgeon attempts to balance two conflicting goals. The scleral flap sutures should be loose enough to permit aqueous humor outflow, but tight enough to prevent postoperative hypotony, anterior chamber shallowing, and choroidal detachment. These conflicting goals had been dealt by using the argon laser to disrupt scleral flap sutures[1]. Laser suture lysis has its own disadvantages such as costly equipment, subconjunctival haemorrhage, button holing and wound leakage, shallow anterior chamber and malignant glaucoma.

An alternative to this technique is placement of scleral flap sutures with slipknots that can be released without the need for an argon laser.

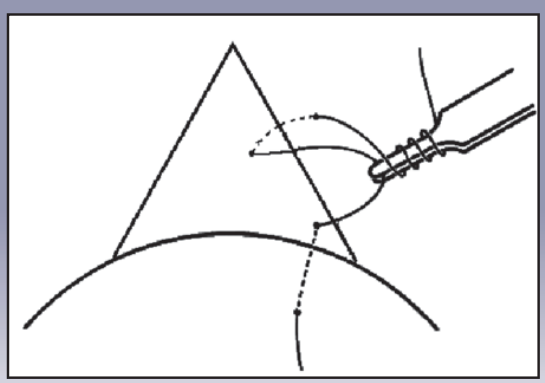

Figure 1a: *Releasable suture is tied with quadruple-throw slipknot*

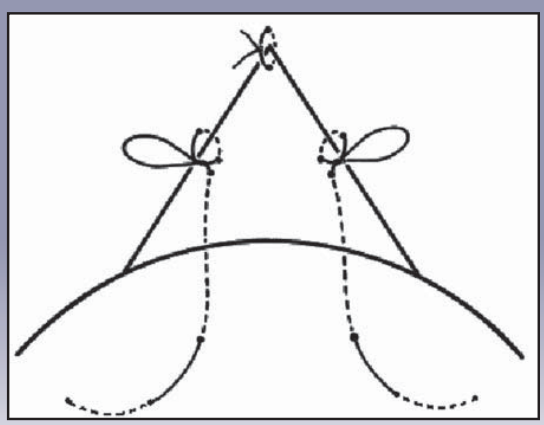

Figure 1b: *Triangular scleral flap is closed with one permanent suture at apex and one releasable suture on each side*

Procedure: The needle of 10 – 0 nylon is passed 1st into the intact sclera post to the scleral flap & then brought out through the scleral flap. This suture is then passed through the base of the scleral flap beneath the conj flap insertion ,through partial thickness cornea 1 – 2 mm from the limbus & then brought out on the epithelial surface of the cornea.

COMPLICATIONS (Fixed v/s Releasable Sutures)

Different studies have found that the complication rate is much less with releasable suture than with fixed suture. Raina KU et al have found 33% less chances of hypotony, 16% less chances of shallowing of anterior chamber and 15% less chances of cataract with relaesble suture than with fixed suture.

Trabeculectomy with Adjunctive Antimetabolites

Antimetabolites currently in use are Mitomycin C, 5-Florouracil and bevacizumab

- Mitomycin C is antineoplastic alkylating agent isolated from Streptomyces caespitosus. It selectively inhibits DNA replication, mitosis, and protein synthesis. The intraoperative dose varies from 0.2 – 0.5 mg/ml for 1 to 5 minutes. Polyvinyl alcohol sponges (Merocel) soaked in MMC are kept underneath conjunctiva after making scleral flap but before entering the anterior chamber.
- *5-Florouracil* - Inhibits DNA synthesis & is active on S phase of cell cycle.It can either be used intraoperatively as 5mg of 5-FU in 0.1cc soaked in sponge or postoperatively daily peri-bleb injections of 5mg of 5-FU can be given till 2weeks

Copious irrigation with balanced salt solution is must after removal of sponges when using anti fibrotic agent intraoperatively to prevent toxicity.

Complications: corneal epithelial & endothelial toxicity, wound leaks, thin cystic blebs, hypotony maculopathy, scleral necrosis.

Mitomycin vs 5-Florouracil - Intraoperative Mitomycin C may be better option to postoperative 5-Florouracil, with lower intraocular pressures, fewer postoperative ocular antihypertensive medications and lesser corneal toxicity.

Moorfields Eye Hospital divides patients in three categories and suggests MMC or 5-FU usage

Low risk patients –(Nothing or intraoperative 5-FU 50 mg/ml)

- No risk factors
- H/o of usage of topical medications (beta-blockers/ pilocarpine)
- Afro-Caribbean (Elderly)
- Youth <40 with no other risk factors

Intermediate risk patients (Intraoperative 5-FU 50 mg/ml or MMC 0.2mg mg/ml)

- H/o of usage of topical medications (adrenaline and analogues)
- Previous cataract surgery without conjunctival incision (capsule intact)
- Combined glaucoma filtration surgery/cataract extraction)
- Previous conjunctival surgery e.g. squint surgery/ detachment surgery/trabeculotomy

Figure 2

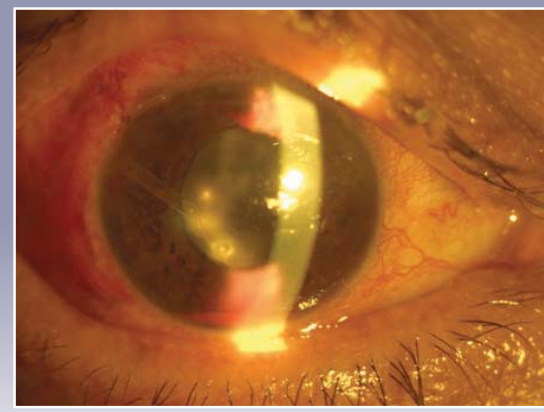

Figure 3

High risk patients (Intraoperative MMC 0.5 mg/ml)

- Neovascular glaucoma
- Chronic persistent uveitis
- Previous failed trabeculectomy/tube
- Chronic conjunctival inflammation
- Aphakic glaucoma (A tube may be more appropriate in this case)

Other modalities to prevent excessive scarring:

- Bevacizumab- A recombinant humanized anti-VEGF approved as an antiangiogenic agent. It prevents the ocular neovascularisation. Role of VEGF is known in wound healing and fibroblastic proliferation. Due to antiangiogenic activity excessive fibroblastic proliferation is prevented. Subconjunctival bevacizumab is a potential adjunctive treatment for reducing the incidence of bleb failure during trabeculectomy.
- Other antifibrotic agents under investigation include cytosine arabinoside, bleomycin, rapamycin, doxorubicin, daunorubicin, 5-fluorouridine, 5′-monophosphate, 5-fluoroorotate, heparin, Taxol, cytochalasin-B, colchicine, immunotoxins, and interferon-a-2b

Trabeculectomy with Ologen Implant

Ologen implant is a drug-free, biodegradable, porous collagen matrix of 1% collagen/C-6-S copolymer with a diameter of 6 mm and a thickness of 2 mm. It provides controlled resistance between the anterior chamber and the subjconjuctival space in the early postoperative period (decreased chance of hypotony) and maintains long-term IOP control by avoiding early scar formation and creating a loosely structured filtering bleb.Its advantages are:

- Conjunctival morphology not altered (as compared to MMC)
- Good bleb structure is achieved

Glaucoma Drainage Devices

All modern Glaucoma Drainage Devices (Implants) consist of a tube that shunts aqueous humor to an end plate (or explant) located in the equatorial region of the globe. There are two types of shunting devices: Valved (such as Ahmed) and Nonvalved (such as Molteno and Baerveldt).

Selection of Glaucoma Drainage Device

- For a beginning surgeon, valved devices may be preferred as the surgical technique is simpler with localization to one quadrant without manipulation of the adjacent rectus muscles.
- The most important factor determining the type of implant selected is the target IOP, both in the short-run and long run. The valved devices provide more immediate IOP control and a lower rate of hypotony.
- Plate material has been studied in various studies to determine its influence on final IOP, as it may affect tissue reaction and the degree of bleb encapsulation.

The role of glaucoma drainage implants has historically been limited to refractory glaucoma.

The Ahmed glaucoma valve was shown to be very effective in treating medically uncontrolled IOP after pars plana vitrectomy and silicone oil injection for complicated retinal detachments. IOP was reduced from a mean of 44± 11.8 mm Hg before surgery to 14± 4.2 mm Hg at the most recent follow-up after surgery (P<0.001). The number of glaucoma medications reduced after surgery was also statistically significant[4].

Coleman et al reported clinical outcomes of AGV in eyes with prior or concurrent penetrating keratoplasty. The cumulative probabilities of success at 12 and 20 months were 75.4% ± 8.2% and 51.5% ± 11.4%, respectively[5]. Glaucoma drainage devices are increasingly being used in pediatric glaucoma which is often refractory to conventional medical and surgical therapy. Billson et al reported favorable outcomes in developmental glaucomas using two-stage implantation of the Molteno implant where final IOP with adjunctive glaucoma medications was less than 21 mm Hg in 78% of the cases6. Coleman et al evaluated AGV in pediatric glaucoma cases and reported cumulative probabilities of success at 12 and 24 months to be 77.9% ± 8.8% and 60.6% ± 13.7%, respectively[7].

Various studies in literature suggest that glaucoma drainage implants may have similar efficacy as well as safety profile compared to trabeculectomy with antimetabolites. The tube versus trabeculectomy demonstrated similar intraocular pressure reduction at 1 year of follow-up[8].

Complications of glaucoma drainage devices include tube obstruction due to blood, iris incarceration, vitreous, tube retraction, hyphema, tube extrusion etc.

Cyclodestructive Surgery

Destruction of the ciliary body has been used to treat glaucoma since the 1930s[9]. In cyclodestructive procedures, the secretory epithelium of the ciliary epithelium is damaged, which leads to reduced aqueous humor secretion and lower IOP. Because the ciliary epithelium can regenerate, multiple treatments are necessary in some patients to achieve the desired long term IOP lowering effect.

Selective destruction of the ciliary body with electrocautery was first applied by Weve in 1933 (nonpenetrating diathermy) and Vogt in 1936 (penetrating diathermy). Technique involves placement of 1 or 2 rows of diathermy lesions 2.5-5 mm post to the corneoscleral junction with an electrode with a current of 40 – 45 mA for 10 – 20 secs However, the high complication rate, the less than satisfactory results, and the introduction of cyclocryotherapy by Biette in 1950 reduced the use of cyclodiathermy

Cyclocryotherapy was the cyclodestructive procedure of choice for more than three decades.It destroys the ability of the ciliary processes to produce aqueous humour by the intracellular crystal formation & ischemic necrosis. NO or CO2 cryosurgical unit may be used. Cryoprobe is placed 1 mm from the limbus temporaly, inferiorly, nasally & 1.5 mm superiorly to cause maximum freezing. - 60 - -80 degree temp for a duration more than 60 secs is used. Two or three quadrants may be treated with 3-4 applications per quadrant. There are no precise guidelines on how many applications to be applied for a pattent but it is best to undertreat rather than the risk of pthisis.

The use of xenon arc photocoagulation in 1961 and the ruby laser in 1971 led to the application of laser energy as a method of cycloablation. In 1981, Fankhauser and associates incorporated a thermal mode into a neodymium:yttrium-aluminum-garnet (Nd:YAG) laser system to perform trans-scleral cyclophotocoagulation (CPC). More recently, semiconductor diode laser technology has been used successfully for cyclodestructive surgery. Currently, 810 nm (diode) and 1064 nm (Nd:YAG) are the two most popular wavelengths for trans-scleral cyclodestructive surgery. The diode laser offers several advantages over the Nd:YAG laser including smaller size (portability) and balance of emitted energy to absorbed energy. Thus the diode laser has found wider use.

Other techniques are being investigated, including transpupillary CPC, transvitreal endocyclophotocoagulation, and endoscopic CPC.

With transpupillary visualisation

- Direct transpupillary treatment of the ciliary processes with the argon laser (488nm) is rarely used because a clear visual axis and a well-dilated pupil are required to enable photocoagulation of the entire length of the ciliary processes.
- Transpupillary CPC of the ciliary processes, exposed through peripheral iridectomy or a widely dilated pupil, can be effective in the treatment of ciliary block glaucoma The mechanism may be related to a laser-induced retraction of the ciliary body.

With endoscopic visualisation

- Endocyclophotocoagulation, an intraocular procedure in which a laser probe is used to treat the ciliary processes at the time of pars plana vitrectomy, offers the possibility of selectively treating the ciliary body epithelium with relatively sparing of underlying tissues. Endoscopic CPC through a cataract incision at the time of cataract surgery with trabeculectomy and cataract surgery appears to be a reasonably safe and effective procedure for managing glaucoma and cataract.

Endoscopic CPC may prove to have more predictable results and lower complication rates than trans-scleral procedures; however, this is a more invasive technique, which is not currently in wide use.

Complications of cyclodestructive procedures

These procedures can lead to complications like inflammation, transient IOP rise, hyphema, choroidal detachment,vitreous haemorrhage and cataract.

Management of refractory glaucoma is a big challenge. In this article, we discussed the various treatment modalities, their indications and complications for the treatment of refractory glaucoma.

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Rapid Assessment of Avoidable Blindness (RAAB) Survey

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The global burden of blindness and visual impairment as, estimated by WHO in 2010, revealed that around 285 million people were visually impaired (presenting visual acuity less than 6/18 in the better eye) including 39 million people were blind (presenting visual acuity worse than 3/60 in the better eye)[1]. Prior to this, in 2004, WHO estimated that there were 314 million visually impaired people including 45 million people with blindness[2]. This demonstrates that considerable accomplishments have been achieved in the control of avoidable visual impairment and blindness globally through effective planning and implementation of national and district level eye care programmes.

The main cause of blindness in the world is cataract (51%) followed by glaucoma (8%) while uncorrected refractive errors and cataract are the major causes of visual impairment (43% & 33% respectively)[1]. The 2010 data indicated that overall, 80% of all blindness and visual impairment are avoidable. The poor and least educated communities remain most affected by visual impairment and blindness. Moreover, this data also revealed that nearly 82% of the blind population globally, is aged 50 years and older[1].

The Vision of the World Health Organization is to achieve "A world in which no one is needlessly visually impaired, where those with unavoidable vision loss can achieve their full potential, and there is universal access to comprehensive eye care services"[3]. In order to fulfill this commitment, continued assessment of the magnitude and causes of blindness in all countries is essential.

India is also committed to the achievement of the universal goal of eliminating avoidable blindness by year 2020 as part of this global initiative with Vision 2020-Right to Sight. India was the first country to have launched the National Programme for Control of Blindness way back in 1976. Over the past three and a half decades, the implementation of activities under the National programme has been guided by a series of population based surveys. Results of various surveys have helped in identification of need based strategies and to have up to date information on prevalence and causes of visual impairment.

Rapid assessment of avoidable blindness (RAAB) is a rapid methodology to conduct a population based survey of visual impairment and eye care services among people aged 50 years and over. It provides data on the prevalence of blindness and visual impairment, its main causes, the output and quality of eye care services, barriers, cataract surgical coverage and other indicators of eye care services in a specific geographical area. RAAB focuses primarily on the prevalence of avoidable blindness, which is blindness due to cataract, refractive errors, trachoma, onchocerciasis, and other corneal scarring[4]. This survey is a relatively cheap and easy means of generating population-based data on burden of blindness. It is now internationally accepted cost-effective survey method for assessment of avoidable blindness in any country, state or district. Many countries are now using the RAAB as a planning tool for Vision 2020 programmes.

RAAB survey is not a detailed blindness survey. Due to the cost and time involved in conducting detailed surveys for blindness and the rigorous methods, logistics and human resource that are needed for such surveys, rapid assessment of blindness surveys are increasingly being used to document changes in the prevalence of blindness.

These surveys are needed in order to have up to date information on prevalence and on causes of visual impairment & blindness and henceforth in planning, setting policies and priorities and for evaluating global eye health status and programmes. They are essential in monitoring existing blindness control programmes and thus aid in modifying these programmes, as and when required.

A major advantage of a RAAB survey is that the entire process of carrying out a RAAB survey, from planning to the collection of field data, data analysis and report writing, can be conducted by locally available staff. Three or four teams with transport can cover the usual required sample size in a period of 4-5 weeks, including one week of training. The collection of data can be done by local ophthalmologists and experienced ophthalmic assistants, together with an assistant who does not need to be medically trained. Local staff can also enter the data directly into the software package.

Through a RAAB survey, the following objectives can be fulfilled:

- Assessment of the prevalence of blindness among the 50+ population.
- Assessment of the proportion of avoidable blindness to total blindness in 50+ population.
- Identification of the major causes of blindness and avoidable blindness in the region.
- Documentation of cataract surgical trends in the region.
- Determination of visual outcomes after cataract surgery.
- Assessment of barriers to the uptake of cataract surgery.

- Assessment of Cataract Surgical Coverage (the proportion of operable cataract cases that have been operated at a particular point in time)
- Assessment of the effect of socio-demographic factors on the prevalence of blindness.
- Estimation of total number of blind in the country in the year of the survey.

Why 50+ population is chosen in a RAAB survey

The key reason of including only people aged 50 years and above in blindness surveys are that nearly 85% of all blindness is seen in this population. Moreover, the survey becomes rapid and coverage is better in this population. The sample size requirement is also minimized as prevalence of blindness is high in this age group. Nearly all cataracts occur in this age group. Compliance is better in this age group as they are in need of eye care services and are usually found at home during the surveys. This was also demonstrated by a study where assessment of the 50 year and above age group proved to be a good indicator for the causes of blindness and visual impairment in the total population and for determining those causes of blindness that are avoidable[5]. The authors reported that such an assessment required a much smaller sample size, less than 20% of the sample size for the total population, and hence is likely to be less expensive.

Designing a RAAB survey

Like all surveys, RAAB is a cross sectional study aiming to capture details about the population at a given time. RAAB is suited for a population level of 0.5 to 5 million and gives accurate estimates of blindness and moderate visual impairment for that population. Usually in an Indian setting, districts can be taken as broad population units within which samples can be selected for survey.

Designing a RAAB survey will involve following multiple steps and survey coordinators will have to traverse through these while planning and undertaking this survey.

- Sample Size calculation and computing number of clusters
- Preparation of sampling frame and selection of survey areas (clusters)
- Selection of survey clusters within the village/ward

Sample Size calculation and computing number of clusters: Like all prevalence surveys, the requirements for calculating sample size are estimated prevalence of the disease under study, confidence limits and precision for the results obtained, response rate, and level of significance. In case of cluster sampling where clusters have to be selected, in order to account for degree of heterogeneity in the sample, a measure called 'design effect' is considered. This will increase the sample size in order to reduce the higher random error introduced within cluster sample. Previous surveys conducted in the same region will give the estimates of prevalence of blindness that can be used while calculating the sample size. The formula reads as $Z^2 P Q W/L^2$ wherein:

- Z is the standard normal deviate within 2 standard deviation ie. 95% confidence interval=1.96
- Population prevalence (P) of blindness by previously published available data
- Q (proportion of population free of blindness)= 100-P
- Power =80%
- W=Design effect to account for cluster sampling design=1.5
- L=(relative precision)=20% of Prevalence

Let us understand this by an illustrative example. The last RAAB done in India reported blindness (defined as presenting visual acuity less than 6/60 in the better eye as per criteria laid down by the National Programme for Control of Blindness, Government of India) among 50+ population as 8%[6]. Considering 20% relative precision, 95% Confidence Interval (5% level of significance), design effect as 1.5, and a response rate of 80%, approximate sample required will be 2500 individuals. Thus as calculated above, we will sample 2500 individuals aged 50 years and above. We will also have to consider now the cluster size- which means from each selected cluster, how many subjects will have to be included. Usually we take a cluster of 50 people that can be examined in a day. Thus if the sample size is 2500, we will require 50 clusters from the sampling frame (region included for the blindness survey).

Preparation of sampling frame and selection of survey areas (clusters): The sampling frame is the population base from where the samples are drawn. All the enumeration areas within a district/state will have to be listed along with the total population size. It is also suggested to have the population structure divided within five year intervals and separated by sex, within the enumeration areas. This will allow computing adjusted prevalence of blindness by age and gender. In rural areas, villages are listed block wise and in urban areas municipal wards are listed. These are referred as survey areas within sampling frame. Census and electoral polling lists are of help while preparing this population frame. The areas and their population will be required for random selection of clusters according to probability proportionate to size meaning the clusters that have a higher population will receive a higher probability for selection. Software including RAAB software will allow for random selection of clusters. 50 random clusters will have to be selected if our sample size was 2500 individuals as calculated above.

Selection of survey clusters within the survey areas: From each survey cluster, we have to include 50 individuals aged 50 years and above. If we consider a village, with a population of 4,000 that has around 20% population aged 50 years and above, implying that there will be 800 subjects aged 50+ in this village. In order to conduct the RAAB survey, we need to select 50 individuals randomly from 800 subjects. In order to cover 50 individuals for assessing blindness and visual impairment, we will need to cover a cluster with total population of 500 people. Thus, we will now divide this village of size 4000 into compact segments of size 500, eight such segments will be formed and one of these is chosen randomly for the survey. The survey coordinator will be required to have a map of the village/ ward and then will have to create these compact segments in consultation with the local people/ health authorities of the region. The segment chosen should be identified in advance of the team visiting the households and examining eligible subjects in the chosen cluster (Figure 1). This method of sampling is compact segment sampling[7].

Conduct of RAAB surveys

- Constituting a survey team
- Training, logistics and computing inter-observer variation for examining teams

Figure 1: *Selection of cluster for a RAAB survey*

Figure 2: *Rapport building and liasoning with key stakeholders and residents for conducting a RAAB survey*

- Ophthalmic examination and filling of RAAB Questionnaire

Survey team

After selection of clusters and rapport building with local stakeholders and residents, (Figure 2) the survey team can begin field work. There could be one to five such teams and each may cover one cluster in one day. The team would essentially have one ophthalmologist, one optometrist and one field worker/assistant. A local health care volunteer should always be incorporated in the survey team for increasing compliance and coverage.

Training, logistics and computing inter-observer variation

Before starting the actual field survey, training of all study personnel on RAAB survey record forms, (Figure 3) decreasing inter-observer variation (IOV) is mandatory. All field staff must be thoroughly trained so that they uniformly follow the same procedure to identify eligible subjects, to assess visual acuity and examine the lens, and to record the data. The inter-observer variability must be minimised and this has to be checked during the training. Each team should be given standardised instructions on definitions, method of selection of the subjects, examination protocol, method to obtain and record the data, etc.

Logistics such as direct ophthalmoscope (with spare batteries), portable slit lamp and mydriatic, trial frame, occluder, pinhole (preferably with multiple holes), torch with spare batteries, Snellen's illiterate E charts (6/18 and 6/60 optotype), pencils and pens, rope-measure for 6 and 3 meter, clipboards to hold the forms, survey forms map of population unit divided in segments, referral slips and basic drugs for treatment should be made ready well in advance. The teams should be trained both in the hospital as well as in the field and should be well versed with all study procedures, survey records, equipments to be used and all examination techniques.

Before undertaking the RAAB survey, it is important to know whether all examiners agree on the assessment of visual acuity, pinhole vision, lens status and cause of visual impairment. To measure this, the findings of each examiner are compared with the findings of the most experienced examiner, the so-called "Gold Standard". It is assumed that the findings of the Gold Standard are the correct findings. The RAAB software package has a module to calculate the inter-observer agreement, which is expressed as the Kappa coefficient. For the purpose of this survey, the Kappa coefficient is the most

Figure 3: *Training of various team members involved in a RAAB survey*

appropriate measure of agreement. A Kappa of 1.00 indicates perfect agreement between examiners; a Kappa of 0 indicates no agreement other than what can be attributed to chance, and a negative value indicates less than chance agreement. A Kappa of more than 0.8 denotes very good agreement.

The findings on the following four examinations are compared:

- Assessment of visual acuity in each eye;
- Assessment of visual acuity with pinhole in each eye;
- Examination of the lens in each eye;
- Assessment of the main cause of presenting VA<6/18 in each eye and in person

RAAB Survey Record & Ophthalmic Examination

Essential information pertaining to the survey objectives is captured through the use of RAAB Survey questionnaire – which is a standard tool with seven different sections. The sections are as follows:

- General demographic details
- Visual Acuity (VA)- presenting vision and pinhole vision
- Lens examination
- Principal cause of presenting vision <6/18
- History
- Why cataract operation was not done
- Details about cataract operation

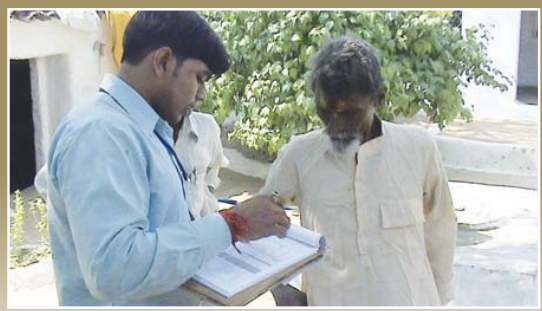

Figure 4: *Filling up of the RAAB survey record form*

Figure 5: *Assessing visual acuity in the field by using the Snellen 6/18 optotype*

Table 1
Categories and definition of blindness and visual impairment

Presenting distance visual acuity		
Category	**Worse than:**	**Equal to or better than:**
Mild or no visual impairment		6/18
Moderate visual impairment	6/18	6/60
Severe visual impairment	6/60	3/60
Blindness	3/60	No light perception

A standard protocol is followed for examination and filling of the RAAB survey record form. (Figure 4) After filling in the demographic details of the eligible individual, VA is measured with the illiterate Snellen "E" chart using optotype size 6/18 on one side and size 6/60 on the other. (Figure 5) All measurements are taken in full daylight with available spectacle correction. The team measures a distance of 3 and 6 meters with a rope. This allows each eye to be classified as:

- can see 6/18
- cannot see 6/18 but can see 6/60
- cannot see 6/60 but can see 3/60
- cannot see 3/60 but can see 1/60
- light perception
- No light perception.

Presenting VA is unaided VA in participants not using any spectacles while in those using spectacles, it is recorded with spectacles. If the presenting VA is less than 6/18 in either eye, then pinhole vision is also measured. As per WHO, blindness and visual impairment are categorized as depicted in Table 1.

A comprehensive ocular examination is performed on every participant. This includes an undilated assessment of the lens using a direct ophthalmoscope (Figure 6). The lens status of all participants is assessed by both torch and distant direct ophthalmoscopy, by an ophthalmologist in a shaded or dark environment. All eyes that cannot see 6/18 with available correction are examined with a direct ophthalmoscope and with a portable slit lamp (Figure 7) if available to assess the cause of the visual impairment. Only the primary cause of blindness or visual impairment is recorded. If there are two or more primary disorders, equally contributing to the visual loss, then the WHO convention is to record the cause that is

Figure 6: *Distance direct ophthalmoscopy for assessment of cataract in a rapid survey*

Figure 7: *Examination of a 50+ individual by the ophthalmologist with the aid of a portable slit lamp*

easiest to treat or to prevent[8]. All information is recorded on a standardized form. People who have a vision-impairing cataract (Figure 8) are asked why they have not undergone cataract surgery, and up to two responses are marked per person in pre-coded categories. Those who have undergone cataract surgery are asked about the details of their operation (e.g. place, age, type of operation, satisfaction). People with a treatable eye condition are referred for appropriate treatment.

RAAB Software and analysis

The RAAB software is available for free use by downloading from link http://www.cehjournal.org/files/rapid-assessment-avoidable-blindness.html[9]. Detailed guidelines

Figure 8: *An elderly female with vision-impairing cataract*

on use of software are mentioned within RAAB manual and within the software. The help screens can be used for necessary assistance while using the software. On installing, sample database can be used for illustration and understanding purposes.

The software has provisions for calculation of sample size, selecting cluster units from the sampling frame, entry of inter-observer variation form; survey data and analyzing it. The entered survey data can be subjected for cleaning by inbuilt consistency and completeness checks. Usually two data entry operators are needed to enter the complete data.

The software gives results for prevalence of blindness, severe visual impairment and visual impairment and their causes, prevalence of aphakia and pseudophakia, cataract surgical coverage, barriers to cataract surgery and details about cataract surgery. All result outputs are presented in tables and sex disaggregated results are obtained permitting a gender analysis of all collected data.

Conclusion

Good planning and organization are vital for success of a RAAB survey. Quality assurance and monitoring are key areas of concern. All activities such as selection of sampling frame for the survey, baseline needs assessment of the community, cluster selection, recruitment & training of staff, arranging logistics and managing the data – are all essential steps for a fruitful outcome. Conducting RAAB surveys on a periodic basis will help in effective implementation of the National Programme for Control of Blindness & achieving Vision 2020 targets in our country.

Acknowledgement

International Centre for Eye, Health, London School of Hygiene & Tropical Medicine, Keppel Street, London WC1E 7HT, United Kingdom, Email: icehorg@iceh.org.uk.

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DOS Members Directory - 2013

All members are requested to update & check their present address (Clinic & Residence), Phone numbers, Fax, E-mail address, Mobile, any additions in degrees and sub-specialties for incorporating in the next edition of the "DOS Members - Directory.

Please update the details latest by **5th February, 2013** at website www.dosonline.org.

If you have any query, please do not hesitate to contact us.

DOS Secretariat
Dr. Rohit Saxena,
Secretary, Delhi Ophthalmological Society
Room No. 479, 4th Floor, Dr. R.P. Centre for Ophthalmic Sciences,
AIIMS, Ansari Nagar, New Delhi – 110029
Tel. : 011-26588074 ◆ Email: dosrecords@gmail.com

Resolutions / Suggestions for General Body Meeting

DOS members are requested to send us their **suggestions or resolutions** to be discussed in the general body meeting to be held on 14th April, 2013. These will be discussed first in the executive meeting and then forwarded to **General Body Meeting.** Last date of receipt 4th February 2013.

– Secretary DOS

Delhi Ophthalmological Society

(LIFE MEMBERSHIP FORM)

Name (In Block Letters)_____

S/D/W/o _____ Date of Birth_____

Qualifications_____ Registration No._____

Sub Speciality (if any) _____

ADDRESS

Clinic/Hospital/Practice _____

_____ Phone _____

Residence_____

_____ Phone _____

Correspondence _____

_____ Phone _____

Email _____ Mobile No. _____

Proposed by

Dr. _____ Membership No. _____ Signature _____

Seconded by

Dr. _____ Membership No. _____ Signature _____

[Must submit a photocopy of the MBBS/MD/DO & State Medical Council / MCI Certificate for our records.]

I agree to become a life member of the Delhi Ophthalmological Society and shall abide by the Rules and Regulations of the Society.

(Please Note : Life membership fee Rs. 5100/- payable by DD for outstation members. Local Cheques acceptable, payable to Delhi Ophthalmological Society)

Please find enclosed Rs._____in words _____ by Cash

Cheque/DD No._____ Dated_____ Drawn on_____

Signature of Applicant with Date

Three specimen signatures for I.D. Card.

FOR OFFICIAL USE ONLY

Dr._____has been admitted as Life Member of the Delhi Ophthalmological Society by the General Body in their meeting held on_____

His/her membership No. is _____. Fee received by Cash/Cheque/DD No._____ dated_____

drawn on _____.

(Secretary DOS)

INSTRUCTIONS

1. The Society reserve all rights to accepts or reject the application.
2. No reasons shall be given for any application rejected by the Society.
3. No application for membership will be accepted unless it is complete in all respects and accompanied by a Demand Draft of Rs. 5100/- in favour of "Delhi Ophthalmological Society" payable at New Delhi.
4. Every new member is entitled to received Society's Bulletin (DOS Times) and Annual proceedings of the Society free.
5. Every new member will initially be admitted provisionally and shall be deemed to have become a full member only after formal ratification by the General Body and issue of Ratification order by the Society. Only then he or she will be eligible to vote, or apply for any Fellowship / Award, propose or contest for any election of the Society.
6. Application for the membership along with the Bank Draft for the membership fee should be addressed to Dr. Rohit Saxena, Secretary, Delhi Ophthalmological Society, Room No. 479, 4th Floor, Dr. R.P. Centre for Ophthalmic Sciences, AIIMS, Ansari Nagar, New Delhi – 110029.
7. Licence Size Coloured Photograph is to be pasted on the form in the space provided and two Stamp/Licences Size Coloured photographs are required to be sent along with this form for issue of Laminated Photo Identity Card (to be issued only after the Membership ratification).
8. Applications for 'Delhi Life Member' should either reside or practice in Delhi. The proof of residence may be in the form Passport/Licence/Voters Identity Card/Ration Card/ Electyricity Bill/MTNL (Landline) Telephone Bill.

Member Benefits of Delhi Ophthalmological Society

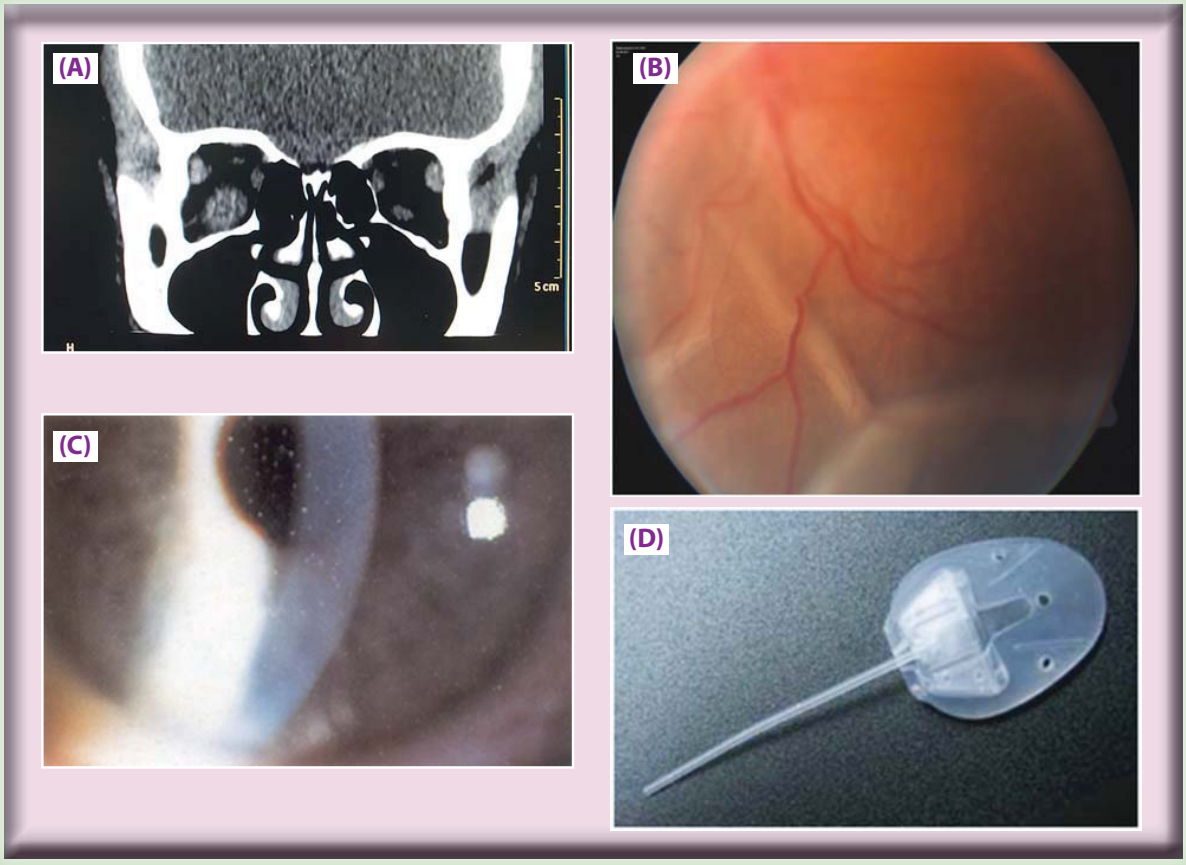
- Discounted registration fees for 2013 Annual Conference.
- DOS Times (Monthly news and views bulletin) & Delhi Journal of Ophthalmology (Quarter Scientific Journal)
- Receive Digital Directory of Members
- Search Option of Members at website.
- Access to past issues of DOS Times from DOS Website. Registered members can access the various articles, as well as search for articles of their interest.
- Access to hundreds of hours of surgical videos, talk and recordings of past conferences, workshop and meetings. The various DOS Times videos have also been uploaded and can be viewed online.
- Online Registration and online submission of abstracts and faculty topics for the forthcoming DOS conference the DOS website.
- Access to full text articles of International journals through OVID a part of the DOS library.
- **Attend DOS Teaching Programme:** A structured resident training module.
- **Phaco Training:** Fellowships and National and International travel grants
- **Wet Labs:** Hand on training modules for acquiring clinical and practical skills.

DOS Times Quiz December, 2012

Instructions:

1. Please return your answers to dostimes10@gmail.com or mail them to "**The Quizmaster**, DOS Times Quiz, Dr. Rohit Saxena, Room No. 479, Dr. R.P. Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, Ansari Nagar, New Delhi - 110029". Please write your DOS membership number along with your answers.
2. The answers should reach not later than 23th January, 2013.
   The quiz can also be viewed and directly answ ered on our website www.dosonline.org
3. The results will be announced at the Monthly Clinical Meeting on 27th January 2013. The correct entry will be **awarded a prize of Rs. 2100 along with a certificate.** If there are more than one correct entries, the winner of the prize will be decided by draw of lots.
4. Identify/Diagnose A,B,C,D,.
   Quiz compiled by Dr. Digvijay Singh

Quiz Prizes Sponsored by
M/s. Raymed Pharmaceuticals Ltd.



Membership No. _____ Name : _____

Mobile No. _____ Email: _____

Answer to DOS Times Quiz December 2012

A. _____ B. _____

C. _____ D. _____

Ocular Trauma Terminology and Classsification

Ocular trauma is a commonly encountered emergency in a routine medical practice. Early identification with high index of suspicion, improved drug availability, diagnostic and microsurgical techniques have enhanced visual and anatomic outcome in traumatized eyes. An attempt has been made to generalize standard ocular trauma terminology and classification system to simplify initial examination and treatment plan in ocular trauma cases.

Ocular trauma terminology (proposed by Kuhn and co-workers)	
Term	**Definition**
Eye wall	Sclera and cornea
Closed globe	Eye wall doesn't have full thickness wound, may harbor partial thickness laceration.
Open globe	Eye wall has full thickness wound.
Rupture	Full thickness wound caused by blunt object. May or may not be at the impact site.
Laceration	Full thickness wound caused by sharp object occurring at the site of impact.
Penetrating injury	Single, full thickness wound usually caused by sharp object.
Intraocular foreign body injury	Retained foreign body through a single entrance wound.
Perforating injury	Two full thickness wounds of the eye wall caused by a same projectile.
Contusion	Closed globe injury caused by a blunt object. May or may not be at the site of impact.
Lamellar laceration	Closed globe (partial thickness) injury of the eye wall or bulbar conjunctiva caused by a sharp object at the site of impact.
Superficial foreign body	Closed globe injury with impacted foreign body in the eye wall or conjunctiva not resulting in a full thickness defect in the eye wall.

The Ocular Trauma Classification Group has proposed a standardized system for classification of ocular injuries. It is based on four characteristics: Mechanism of injury, initial visual acuity, pupillary involvement and most posterior location of wound.

Ocular Trauma Classification Scheme	
Open Globe Injury	**Closed Globe Injury**
Type	***Type***
A. Rupture	A. Contusion
B. Penetrating	B. Lamellar laceration
C. Intraocular foreign body	C. Superficial foreign body
D. Perforating	D. Mixed
E. Mixed	
Grade	***Grade***
Visual acuity	*Visual acuity*
1. >=20/40	1. >=20/40
2. 20/50 - 20/100	2. 20/50 – 20/100
3. 19/100 – 5/200	3. 19/100 – 5/200
4. 4/200 – light perception	4. 4/200 – light perception
5. No light perception	No light perception
Pupil	***Pupil***
Positive - RAPD + in affected eye.	Positive - RAPD + in affected eye.
Negative- RAPD – in affected eye.	Negative – RAPD – in affected eye.
ZONE	ZONE
I. Isolated to cornea including corneoscleral limbus.	I. External (limited to bulbar conjunctiva, cornea and sclera).
II. Corneoscleral limbus to 5mm posterior into the sclera.	II. Anterior segment involvement upto pars plicata including posterior lens capsule.
III. Posterior to the anterior 5mm of sclera.	III. Posterior segment involvement.

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DOS Correspondent
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