Editorial

Dear Colleagues,

The tremendous response and appreciation received by the Editorial board to the article on Sir Harold Ridley has encouraged us to continue the trend on having a glimpse of the life and work of great ophthalmologists who have left an indelible impression on all of us. Hence we have decided to share with you, in this edition of DOS times, the contributions of Dr Charles Kelman, who is also known as "The Father of Phacoemulsification".

In this issue, readers will have a glimpse of various important topics of clinical and academic importance namely, pre lasik evaluation, bandage contact lens, Marfan Syndrome etc.

Newer appliances like Ret Cam has been included in this issue. With this digital instrument it has become easy to document and follow-up paediatric fundus especially for ROP and retinoblastomas. Though it is an expensive equipment but I think it is must for Paediatric Ophthalmology set up.

Due to some un avoidable reasons printing & distribution of the August issue of DOS Times was delayed. The inconvenience is regretted.

We are reminding all our members that the midterm conference of DOS will be held on the 21st of November and we have included the registration form for the meet in this issue. I request all of you to register at the earliest.

Dr. Jeewan S. Titiyal

DOS MONTHLY CLINICAL MEETING FOR SEPTEMBER 2004

Venue : **Hindu Rao Hospital,** Delhi
Date & Time : 25-09-04 **(Saturday)** at 2:30 pm

Case Presentation

1. Case Presentation ..... : Dr Vikas Anand / Dr Ruchi Goel
2. An Unusual Case of Optic Neuropathy in a Young Male..... : Dr Bithi Chowdhury

Clinical Talk

- Can we all Switch to Microincision Surgery ? ..... : Dr Ruchi Goel

Mini Symposium :
Imaging Modalities in Ophthalmology

Chairman : Dr. A.K. Nagpaul
Co-Chairman : Dr. K.P.S. Malik

1. A-Scan Biometry ..... : Dr K.P.S.Malik
2. Diagnostic Ultrasonography ..... : Dr B.P. Gulliani
3. CT And MRI in Ophthalmology ..... : Dr Harsh Mahajan

Discussion

Letter to Editor

Dear Editor,

I read with great interest the review article on colour vision published in DOS Times, April, 2004 by Parul Soni, Vandana Kori and Pradeep Venkatesh, A very good article of clinical interest for ophthalmologists who are members of board for various services, but it would have become more interesting if my learned colleagues would also have added the physiology of colour vision.

Photochemicals in the cones have almost exactly the same chemical composition as that of Rhodopsin in the Rods. The only difference is that the protein portions, the opsins, called Photorins in the cones, are different from the scotoprin of the rods. The retinal portions are exactly the same in the cones as in the Rods. The color sensitive pigments of the cones, therefore, are combinations of retinal and photoprins. Three different types of photochemicals are present in different cones, thus making these cones selectively sensitive to the different colors of blue, green and red. These photochemicals are called blue sensitive pigment, green sensitive pigment respectively and red sensitive pigment. The absorption characteristics of the pigments in the three types of cones should peak absorbencies at light wavelengths respectively of 430, 535 and 575 milli microns. These are also the wavelengths for peak light sensitivity for each type of cone, which begins to explain have the retina differentiates the colors. Peak absorption of the so called " Red" cone is actually in the orange color. It is called the "Red" cone because it responds to red more intensely than do any of the other cones.

Photopic vision means vision capable of discriminating color, while scotopic vision means vision capable of discriminating only between shades of black and white. In bright light one's vision is photopic, while below a critical light intensity, vision is scotopic. The reason for this difference is the following : In very dim light, only rods are crpable of becoming dark adapted to a sensitivity level required for light detection. Therefore, in dim light the retina is capable only of scotopic vision. On the otherhand, in very bight light, the rods become light adapted to the point that they either become inoperative or overshadowed by the signals from the cones; in contrast, the cones find bright light especially suitable for optimal function.

Some physiologists believe that the cones in bright light inhibit rod function by transmitting inhibiting signals through the horizontal cells to the synaptic bodies of the Rods. At any rate, in bright light, function of the Retina appears to be based almost entirely on cone detection of the light signals.

References :

1. Text book of Medical physiology- Guyton
2. Alder's Textbook of ophthalmic physiology
3. Textbook of Physiology – C.C. Chattergy

Dr. Sanjay Kumar Teotia
Uttar Pradesh

Dear Dr. Titiyal,

It was a treat to read about the life and works of Sir Harold Ridley. For doctors of my generation who were being trained to perform intracapsular cataract extractions in early seventies, it was unthinkable that most of us would be implanting intra ocular lenses in our life time. It has become possible because of dedication and belief of only one person who worked with a single aim to turn his imagination into reality. Thank you for honouring him with the article on Sir Harold Ridley in DOS Times of July, 2004.

There is a small correction which I would like to mention all Englishmen who are knighted are very particular about it, and I once got a good half an hour lecture on properly addressing such a person from an old friend, Sir Ivan Ewart of RCSB. It is either Sir Nicholas or Sir Nicholas Harold Ridley and not Sir Ridley as mentioned at some places, Sir is never followed by just a surname. Otherwise it was a very informative tribute.

Dr. S. K. Sharma
Gorakhpur

Dear Dr. J.S. Titiyal,

It was pleasing to see that August issue of DOS Times did not carry a photo gallery of DOS executive which totally eclipsed July issue of DOS Times. This was rather out of sync in an academic medical publication.

Dr. N.C. Singhal is one I admire most, as a never say die, DOS member. He should be the only one in the world who has not come across recurrent pterygium after his operations in 21 years of practice ! !

I have read an article "Dry Eye Disease". The article appears to be one on which no editorial member seems to have given a "dekko". I have forgotten all I knew about dry eyes after reading this Jumbo-Mumbo.

If it is not feasible for you to sort out differences between international cure center treatment for dry eye disease or advise a feasible practical management to our members, I request you to employ services of more suitable editors/advisors for DOS Times.

Dr. K.P.S. Malik
Ex-advisor to DOS Times

Charles David Kelman, MD: *Father of Phacoemulsification, Famed Inventor and One of The Great Ophthalmologists of the 20th Century*

Suresh K. Pandey MD,[1,2] **E. John Milverton**, MBBS, FRANZCO, FRCOphth,[1]
Anthony J. Maloof, MBBS, FRANZCO[1]

Fig. 1 Charles David Kelman

Charles David Kelman, MD (Fig. 1), the father of phacoemulsification, Laureate of the American Academy of Ophthalmology, passed away on June 1, 2004 at 74 years of age after a long fight with cancer. He is survived by his wife Ann, his children Lesley Kelman-Koeppel, and Jennifer, Evan, Jason, and Seth Kelman. With Dr. Charles Kelman's demise, we have lost a famed inventor with multifaceted talents and one of the great Ophthalmologists of the 20th Century.

Background and Ophthalmic Education:

Dr. Kelman was born in Brooklyn, New York, USA on May 23, 1930. After graduating from Forest Hills High School and Boston's Tufts University, he completed medical studies at the University of Geneva, Switzerland; an internship at Kings County Hospital, Brooklyn; and residency in Ophthalmology at the Wills Eye Hospital, Philadelphia, PA, USA. Dr. Kelman was Clinical professor of Ophthalmology at New York Medical College and worked as a consultant surgeon at many hospitals throughout the world. He worked as an Attending Surgeon at the New York Eye and Ear Infirmary and Manhattan Eye, Ear and Throat Hospital and in private practice in New York City from 1960.

Ophthalmic Inventions:

The cryo-probe was devised by Dr. Kelman in 1962. This freezing instrument was used for the extraction of cataracts with the capsules intact.[1] This became the most widely used method for intracapsular cataract extraction (ICCE) in the world until about 1978, when it was supplanted by extracapsular cataract surgery with irrigation and aspiration. In 1963 Dr. Kelman pioneered the use of freezing for the repair of retinal detachments. Retinal cryopexy remains an important procedure in retinal surgery to this day.[2]

Struggle And Initial Failure While Working On Phacoemulsification

Dr. Kelman introduced phacoemulsification in 1967, which enabled today's rapid outpatient cataract surgery.[3] The innovation of phacoemulsification was fulfilled with struggle and initial failure.[4] In his most recent publication (Kelman CD. The genesis of phacoemulsification. *Cat Refract Surg Today*. March 2004), he stated

"Four years after my residency, I drafted a grant proposal to study the effects of freezing on the ciliary body, retina, and choroid. I went to bed concerned that the Hartford Foundation would not find the topic of interest, awoke in the middle of the night, and, almost in a trance, added an addendum to my application that would affect the rest of my life and the lives of 100 million patients: "in addition to the freezing studies, this investigator will develop a method for removing a cataract through an incision small enough so that no hospitalization will be required." Mr. E. Pierre Roy, the head of the John A. Hartford Foundation, could easily have rejected my application and put an end to this matter. Instead, he had confidence in my abilities and gave me a 3-year grant, although I did not have the vaguest idea of how to realize my idea.

Mr. Roy's confidence was misplaced for 2 years and 8 months, while I tried everything I could imagine. I first attempted to capture the cataract within a folding lens bag (Fig. 2), crush it inside the bag with manual disintegrators, and then remove the device containing the fragmented lens material from the eye. The rotating devices I tried simply spun the cataract around inside the anterior chamber. High-speed cutting needles, a miniature blender, drills, tiny meat grinders, engraving tools—nothing worked. All the devices yielded opaque corneas in animal eyes.

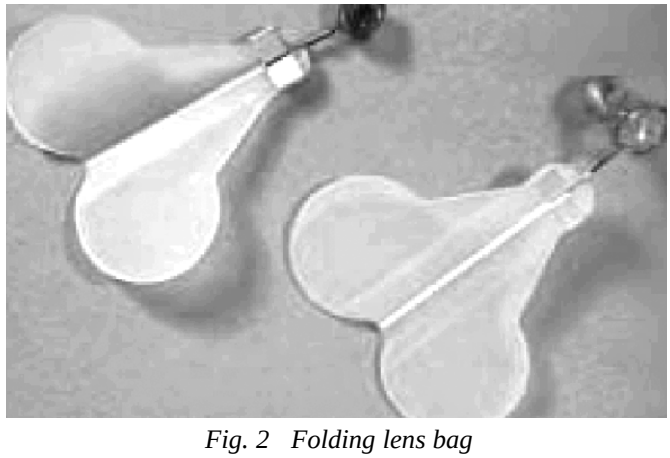

Fig. 2 Folding lens bag

[1]*Intraocular Implant Unit, Sydney Eye Hospital, Macquarie Street, Sydney, Australia;*
[2]*John A. Moran Eye Centre, Department of Ophthalmology and Visual Sciences, University of Utah, Salt Lake City, UT, USA.*

I had meanwhile allowed my hair to grow down to my shoulders, and my teeth badly needed a cleaning. Sitting in my dentist's chair, I became interested in the ultrasonic tool he was using to clean my teeth. He explained that its high-frequency vibration removed tartar without disturbing the tooth itself. I raced out of his office with the bib still hanging around my neck and returned 1 hour later with a cataractous lens. Because I was able to engrave lines on the lens without its jumping off my finger, I believed that I could break up a cataract inside the eye without its spinning or vibrating against the corneal endothelium. Cavitron Corporation ultimately made a prototype with a handpiece that incorporated Irrigation & Aspiration (I/A) (Fig. 3), rather than only irrigation, as with the original dental instrument. My first efforts with this device resulted in opaque corneas until I began using a physiologic solution, imported from the Barraquer Institute in Barcelona, Spain, in place of the simple saline solution. I also realized that the high temperatures that the procedure created inside the eye would denature the corneal proteins.

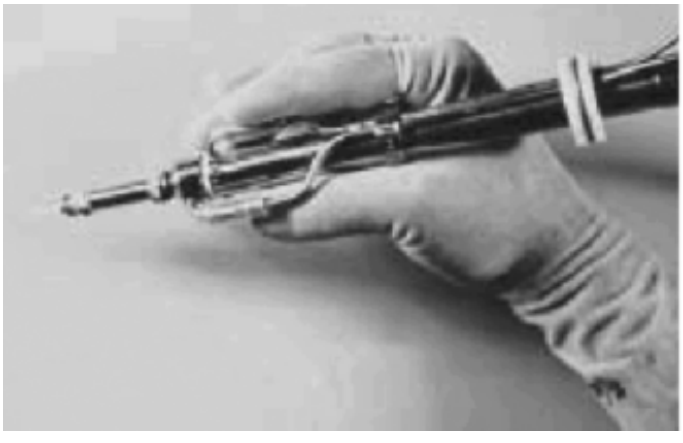

Fig 3. Initial Handpiece by Cavitron Corporation

After several months of successful animal testing, I operated on my first human subject, a man suffering from a painful blind eye due to burned-out glaucoma. The strong surge of suction caused the cornea to collapse 30 to 40 times during the 70-minute phacoemulsification. The next day, his eye was a bag of pus that had to be removed. I spent 2 years seeking a way to prevent corneal collapse and finally found a company in North Carolina that manufactured a device that sensed arterial flow. Cavitron Corporation incorporated this feature into the phacoemulsification device's aspiration line with an air-relief valve. If the speed of the current in the aspiration line exceeded the speed of the irrigation, then a valve opened to halt suction immediately.

One year later, I worked up the nerve to operate on the eye of a patient with central retinal artery occlusion and no light perception. If I had failed that time, I probably would have abandoned the project. A specially designed, three-dimensional micromanipulator supported the weight of the cumbersome phaco handpiece and steadied the phaco tip inside the eye for long periods of time. I deemed the operation a success when the patient achieved light perception postoperatively. The severe striate keratitis present on the first postoperative day subsided after 6 weeks.

The next major attack on phacoemulsification occurred when opponents got the FDA to classify the procedure as experimental and, therefore, non-reimbursable. Reversing this decision required thousands of letters from patients and an appearance before the FDA by the renowned television doctor, Marcus Welby, MD."

In addition to aforementioned statements, the AAO committee headed by Richard Troutman, MD put forward it's finding into phacoemulsification reporting that it delivered the same quality of results as ICCE, and it was the preferred and only method to use in many instances. ICCE developed after extracapsular cataract extraction (ECCE) following the advent of the erysophake and cryoprobe. Until that time, ECCE was complicated by retained cortex and iris prolapse, resulting in a return to the operating theatre in up to 25% of cases. In 1962, one of the then illustrious names in Ophthalmology stated- *"Cataract surgery has been developed to its ultimate state, and any improvements from this date will be insignificant."* The speaker was referring to the suction erysophake for intracapsular removal of cataracts at a time when a patients hospital stay averaged 10 days, followed by 6 weeks of recuperation at home. Dr Kelman, in a recent article (Kelman CD. The genesis of phacoemulsification. *Cat Refract Surg Today*. March 2004), was kind enough to acknowledge those opposed to the development of phacoemulsification saying- *"I also thank my opposition for inspiring me to try harder."*

Dr Kelman preferred the term KPE (Kelman Phaco-emulsification). He initially described the phacoe-mulsification procedure for surgery within the posterior chamber, and it was only in 1972 that he switched to anterior chamber phacoemulsification. Outward hostility occurred when in 1973, prominent Ophthalmologists began losing cataract surgery cases to phaco surgeons. These Ophthalmologists began making outrageous statements such as *"Phaco is OK after you learn it, but the first 50 eyes are blinded during the learning curve"* and *"Phaco causes glaucoma"*. Dr Kelman did not help matters when he stated- *"Anyone over 30 is too old to learn phaco"*. He shocked his colleagues by discharging his patients on the same day or the following day and permitting them to return to full activity on the first postoperative day, when most other practitioners kept their patients in hospital for 6 days.

Acceptance and Advancement on Phacoemulsification

Phacoemulsification has been refined by surgeons during the past 3 decades and this technique has now become the preferred method of cataract surgery in the developed

world. Since 2000, 97% of all cataract surgery in the United States is performed using phacoemulsification according to most recent Survey published by Leaming. Over one million operations of phacoemulsification and lens implantation surgery being performed in the United States alone on an annual basis. The transition to outpatient surgery has removed the need for hospital stays of one week and it is estimated that at least seven million hospital days are saved annually. Neurosurgeons have adopted the Kelman phacoemulsification machine for dissecting tumours from delicate brain and spinal cord tissue in children. In this way, the device has saved hundreds of young lives. Phacoemulsification was the stimulus for other small incision surgeries, including gall bladder, lumpectomy, vertebral disc surgery and many others.

Work on Intraocular Lenses:

In 1975 Dr. Kelman began designing lens aphakic and phakic implants for use in cataract and refractive surgery,[5] since then numerous ophthalmic manufacturers have sought his services, including Alcon Surgical, Advanced Medical Optics, IOLAB, Domilens, and Storz Ophthalmics. The approximate aggregate sales of Kelman-designed lenses by these manufacturers totals more than 340 million dollars, making him the world's most successful intraocular lens designer by far. One of us (SKP) was fortunate to contribute some writings in collaboration with Dr. Kelman and also able to pursue some of the research work on Duet intraocular lens designed by him.

Miscellaneous Inventions:

During the past few years, Dr. Kelman worked on several new projects, including artificial blood vessels, artificial corneas and a magnetic cataract extraction procedure that will retain the patient's normal ability to focus on near and distant objects. In other applications, the magnetic technique has been used to remove plaque from arteries and growths from the digestive tract, prostate, bladder and other areas without invasive surgery.

Recognition and Awards:

Dr. Kelman was honoured for his distinguished career and contributions to Ophthalmology. He was the recipient of several prominent awards including the Ridley Medal by the International Congress of Ophthalmology, the First Innovators Award in Ophthalmology and the Binkhorst Medal, both from the American Society of Cataract and Refractive Surgery, as well as the first Outstanding Achievement Award for excellence in cataract surgery from the American Society of Contemporary Ophthalmology. He was awarded the "Inventor of the Year Award" by the New York Patent, Trademark and Copyright Law Association for his development of the Kelman phacoemulsification procedure. In June 1992, Dr. Kelman was awarded the Prestigious National Medal of Technology by President George H.W. Bush and at the International Congress on Cataract and Refractive Surgery in Montreal, Canada, Dr. Kelman was named "Ophthalmologist of the Century" for his pioneering work in phacoemulsification. Most recently, during the 107th Annual Meeting of the AAO in November 2003, Dr Kelman was honoured by the AAO with the Laureate Recognition award.

He was immediate past president of the American Society of Cataract and Refractive Surgeons. In recognition of the ongoing contribution of Dr. Kelman to anterior segment surgery, the Innovators Lecture of the Society was renamed after him in 2003. The Charles D. Kelman Innovator's Lecture honours the work of individuals whose creativity has benefited Ophthalmologists and their patients. The lecture is presented during a special session at the annual ASCRS Symposium on Cataract, IOL and Refractive Surgery. Charles D. Kelman, MD, presented the First Innovator's Lecture in 1985.

Dr. Kelman wrote several articles, papers and scientific books as well as a book for lay readers on cataracts and an autobiography entitled "Through My Eyes" (both from Crown Publishing).

Hobbies and Activities other than Ophthalmology:

Dr. Kelman found time to learn to pilot his own helicopter and avidly followed his hobbies of golf, music and the performing arts. He entertained on The Tonight Show starring Johnny Carson, The Barbara Walters Show, The Merv Griffin Show, The David Letterman Show, The Oprah Winfrey Show and numerous others. He appeared in concert as a musician with Lionel Hampton and Dizzy Gillespie and has performed in concert at Carnegie Hall, Las Vegas, Atlantic City with The Spinners, Glen Campbell, James Darren, Regis Philbin and others. He devoted his spare time to several new projects, including a musical, "The Right Pair of Shoes", and an album that was released by Columbia Records.

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1. Kelman CD. Cryoextraction of cataracts. *Int Ophthalmol Clin* 1967; 7: 335-346.
2. Kelman CD. A new cryosurgical instrument for treatment of retinal tears. *Trans Am Acad Ophthalmol Otolaryngol* 1966; 70: 288-90.
3. Kelman CD. Phaco-emulsification and aspiration. A new technique of cataract removal. A preliminary report. *Am J Ophthalmol* 1967; 64: 23-35.
4. Kelman CD. In tune with the father of phacoemulsification. *J Cataract Refract Surg* 1997; 23: 1128-9.
5. Kelman CD. Basic principles of IOL design. *Trans New Orleans Acad Ophthalmol* 1984; 32: 78-98.

Vitrectomy in Post-Operative Endophthalmitis : Few Practical Tips

Sanjeev Nainiwal MD, DNB[1], **Dinesh Talwar** MD[2], **S. P. Garg** MD[1], **Hem K. Tewari** MD, DNB[2,3]

Endophthalmitis is defined as an inflammation of the inner coats of the eye associated with exudates in the vitreous, which may be infectious or noninfectious in origin. Although the incidence of intraocular infections after cataract surgery has sharply declined over the past 3-4 decades since the advent of aseptic techniques and the use of prophylactic antibiotics, endophthalmitis still remains one of the most dreaded complications that an ophthalmic surgeon has to face. Sixty to seventy percent cases of endophthalmitis occur after cataract surgery, with an overall incidence of 0.02-0.75% in most large series of operated cataract cases.

As a rule, all patients seen at our centre are given an initial intravitreal antibiotic injection on presentation. Vitrectomy is reserved for patients who do not respond adequately to intravitreal antibiotics within 36-48 hours. While we do prefer to carry out an immediate vitrectomy for patients who present with a visual acuity of light perception only, this is often not possible due to logistic constraints. We have shown in a study carried out at our centre that the results of immediate intravitreal antibiotic injection followed by vitrectomy within 48 hours are as good as those of immediate vitrectomy in patients with postoperative endophthalmitis. If however, the patient has already received an intravitreal antibiotic injection elsewhere, it is advisable to carry out an immediate vitrectomy at presentation. For all cataract surgeons faced with a patient with endophthalmitis, our advice would be:

- *Give an antibiotic injection immediately. Assess the response after 24 hours. If there is no definitive evidence of improvement, please refer the patient to a vitreoretinal surgeon. We are not in favour of multiple intravitreal injections except in patients with an extremely poor prognosis i.e., those with corneal infiltration or those with a cornea too hazy to perform a successful vitrectomy or those with retinal detachment on ultrasonography.*

Today there is no doubt that the mainstay of management of postoperative endophthalmitis is "***intravitreal antibiotics***". However, there are certain situations in which vitrectomy may result not only salvaging the eye but also in providing a favorable outcome in patients with this devastating disease process. Some of the practical tips regarding successful use of this very effective tool in the ophthalmologist's armamentarium are given below:

1 Vitreoretinal Services Dr. R P Centre for Ophthalmic Sciences, AIIMS, New Delhi
2 Centre for Sight, Green Park, New Delhi
3 Sir Ganga Ram Hospital, Rajendra Nagar, New Delhi

Patient selection

- Inaccurate projection of light is not a contraindication of vitrectomy. In fact, it probably has almost no prognostic role at al.
- Patients with significant corneal infiltration are likely to behave poorly, and may be better managed conservatively.
- Patients who have not responded to their first intravitreal injection of antibiotics given 48 hours earlier are candidates for an immediate vitrectomy. Multiple intravitreal antibiotic injections should be avoided as the means of management for endophthalmitis except in cases which are not fit for vitrectomy.
- Patients with a retinal detachment on USG have a poor prognosis following vitrectomy.

Investigations required

- Preoperative ultrasonography (USG) is mandatory prior to vitrectomy in endophthalmitis.
- USG is required to look for presence of a partial/total posterior vitreous detachment and also for presence of a retinal detachment.
- Patients with dense exudates extending upto the posterior one third of the vitreous cavity on USG have a poorer visual prognosis.
- Surgery is easier in patients with a partial or total posterior vitreous detachment.
- The decision regarding when to undertake vitrectomy is however not based on ultrasonography. It is based on clinical factors.
- Electrophysiological tests like VER and ERG have no role in evaluating patients for vitrectomy for endophthalmitis.

Surgical Technique

- Surgery under general anesthesia is preferable for uncooperative patients. As a rule, however, peribulbar anesthesia is adequate for surgery in the majority of patients.
- The corneal incision must be inspected and strengthened by placing additional sutures before starting vitrectomy.
- 3 port pars-plana vitrectomy is carried out in all patients and a 6 mm infusion cannula must be used.

- This 6 mm cannula is always possible to visualize within the vitreous cavity by depressing the cannula inwards and forwards towards the pupil (since the patient is aphakic/pseudophakic, there is no risk of lens damage).
- The infusion bottle must not be kept higher than 24 inches from the patient's eye.
- In patients with pseudophakic endophthalmitis, there is almost always a fibrin membrane covering the iris and the pupillary area. This can be removed from the pars-plana route by making an iridectomy next to the temporal port with the vitrectomy cutter. An MVR blade is then passed through the iridectomy to engage the fibrin membrane and dislodge it from its adhesions to the iris and the IOL surface. The membrane is then eaten away in the anterior chamber by introducing the vitrectomy probe through the iridectomy. Adequate visualization is possible in all cases by this technique.
- A high cutting rate (>600 cuts/minute) and low suction (<100 mmHg) must be kept for the vitrectomy cutter. This will ensure that no undue traction is put on the vitreous gel during the vitrectomy.
- In over half the cases, vitreous exudates are not found to extend beyond the anterior or mid vitreous during vitrectomy.
- Only a core vitrectomy is required to ensure a successful outcome in a majority of cases.
- Vitreous cavity lavage can be carried out by continuing to use the vitreous cutter (in the cutting mode) placed in the centre of vitreous cavity for atleast 5-10 minutes after the infected gel has been removed. This makes it possible to carry out the lavage without causing any turbulence within the vitreous cavity.
- Corneal epithelium debridement can be carried out at any time during the vitrectomy if epithelial edema is preventing visualization, without any risk of corneal ulcer.
- After closure of the sclerotomies, check the corneal wound once more since, the corneal sutures could become loose due to the distortions created.

Today the results of vitrectomy for endophthalmitis have improved considerably. Approximately 80% of patients can expect a visual acuity better than 6/60 following vitrectomy for endophthalmitis. The technique thus offers a glimmer of hope to the afflicted patients.

Risk factors for poor results

Earlier studies have reported that a positive culture, a more virulent organism, delay in onset of initiation of treatment, presence of concomitant ocular disease such as retinal detachment and rubeosis, and a poor initial visual acuity are the risk factors for worse visual acuity results. The EVS findings showed many similar as well as independent risk factors, i.e., older age, history of diabetes, corneal infiltrate or ring ulcer, abnormal intraocular pressure, rubeosis, absent red reflex, a ruptured posterior capsule, and visual acuity of light perception as predictors of poor visual outcome. However, the most important risk factor for decreased final visual acuity was an initial visual acuity of light perception only. Such patients had twice the risk for a worse acuity outcome compared with patients with better than light perception only. It is our experience that the most important prognostic factor in patients undergoing treatment for endophthalmitis is the presence of significant corneal infiltration. Such patients do extremely poor even after vitrectomy.

It is our clinical experience that the worst prognosis occurs in patients with corneal infiltration, in these patients vision is usually unlikely to be salvaged. Today however with appropriate management, it is possible not only to salvage many of the eyes with this devastating condition, it is possible to help them retain useful vision also.

Suggested Readings

1. Talwar D, Nainiwal S. Post – Operative Endophthalmitis : Approach to Management DOS Times 2001; 7 (5) : 3-6.
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5. Cottingham AJ Jr, Forster RK. Vitrectomy in Endophthalmitis : results of study using vitrectomy intraocular antibiotics a combination of both Arch Ophthalmol 1976; 94 (12) : 2078-2081.
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Therapeutic Contact Lenses

Jeewan S. Titiyal MD, **Ramkishor Sah** B.Sc (Hons) Ophth, **Rajesh Sinha** MD, FRCS

The term "therapeutic" is derived from the Greek word "therapeuein" meaning to take care of, or to heal. The term "therapeutic" is often used as if it applied to a specific type of contact lens, when in reality; nearly every lens type can be used in a therapeutic capacity.

Aims

The aims of therapeutic contact lens (TCL) wear are diverse and there are often several options available to achieve a specific therapeutic goal. The use of such lenses for visual improvement is not significant although this can be a secondary benefit from TCLs.

i. Mechanical protection
ii. Relief of symptoms e.g. ocular surface pain (Secondary to suture, filaments, erosion, edema)
iii. Facilitates corneal epithelial healing & adhesion
iv. Prevention of desiccation
v. Drug delivery
vi. Relief of Seals small corneal perforation
vii. Cover irregular surface of tissue adhesive

The decision to use a TCL should be carefully considered, as the risks, particularly microbial infections are substantial.

Classification of TCL

The different types of therapeutic contact lenses presently available are the following:

- Low water content hydrogel soft lens (38%-45%)
- Mid-water content hydrogel soft lens (45%-55%)
- High water content hydrogel soft lens (67%-85%)
- Silicone rubber and silicone hydrogels (38%)
- Collagen shields (63%)

The low water content is thinner than the high-water-content lenses. All these lenses are manufactured by lathe-cut method, except the Bausch & Lomb series of therapeutic lenses, which are spin-cast.

General characteristic of TCL:

1. Low Water Content (LWC): Is better, where there is a tear film problem, because it dehydrates less (e.g. Exposure Keratitis, Dry eye)
2. High Water Content (HWC): Is better, where a painful eye needs several weeks of continuous wear (e.g. Bullous Keratopathy)
3. Therapeutic contact lens wear can be a long-term therapy, so chronic edema and corneal vascularization can be a consequence of such lenses.
4. The range of the radius of curvature of these lenses is 7.80 – 9.50 mm.
5. The overall diameter of the contact lens varies between 13.5 to 16.5 mm (mostly 14.0 mm).
6. These lenses derive their oxygen permeability from their water content, which can be somewhere from 37.5 to 85%.
7. Central thickness varies from 0.10 to 0.25 mm, the lower water content being thinner.

The general principles of lens fitting:

To prevent an excessively tight fitting, the flattest lens that is stable on the eye should be used. In certain conditions a particular lens fit is desired, for example, in recurrent corneal erosion with surface defect, one would be reluctant to choose a lens with a loose fit, which moves excessively and retards proper corneal healing. In this case a stable lens that moves very slightly with the blink on up gaze would be preferred. In treating a small corneal perforation, a lens that would seal the wound is preferred and not a lens that vaults the perforation area. Among the low-water-content lenses, the Plano-T lens is widely used as a therapeutic lens. It is relatively thick (0.15mm) and has a fairly large diameter (14.5mm) and a posterior apical radius (PAR) of (8.00mm).

Although an ultra thin lens is best tolerated by the cornea, it can wrinkle and roll on itself when the corneal surface is irregular. The stability of ultra thin lens can be increased by using a thin lens with a minus power. This increases the lens weight and adds to its stability.

Indications of the TCL

1. Bullous Keratopathy
2. Recurrent Corneal Erosion (RCE) in corneal dystrophies
3. Persistent epithelial defects (PEDs)
4. Traumatic Corneal Abrasion
5. Filamentary Keratitis
6. Postoperative:
   i. Phototherapeutic Keratectomy (PTK)
   ii. Photorefractive Keratectomy (PRK)
   iii. Laser sub-epithelial Keratomileusis (LASEK)
   iv. Corneal Graft: Particularly lamellar graft for rapid re-epithelialization
   v. After Glaucoma Surgery: Bleb leak
   vi. After use of cyanoacrylate glue in corneal fistulas and small perforations (< 2mm)
7. Lid abnormalities like entropion and / or trichiasis.

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8. Neurotrophic Keratitis
10. Chemical burn / injury: (Controversial).
11. Orthoptics: Tinted contact lenses are used for therapeutic purposes in the treatment of amblyopia in young children.
12. Tinted contact lenses can also be used in aniridia and albinism to reduce photophobia.
13. Orthokeratology: This is the practice of the reduction of refractive error by altering the shape of the cornea with contact lenses. It is believed that the cornea can be flattened by using increasingly flatter contact lenses.

Selection of Therapeutic contact lenses

- While the fundamental aim of the therapeutic lens is to assist the recovery of the cornea from the condition under treatment or to ameliorate symptoms, the lens should also have minimal impact on corneal physiology. High Dk contact lenses are to be preferred since they reduce hypoxic stress and are especially indicated in cases where healing is required, since epithelial healing is promoted in the presence of normal levels of oxygen. The design criteria for silicone hydrogel contact lenses almost exactly match these requirements.

General guidelines for fitting Therapeutic contact lenses

- Keratometry is often not possible owing to the irregular mires associated with the underlying condition. Hence standard Keratometry or Keratometry readings of the other eye may prove helpful. Generally 0.3mm is added to flatter to flattest K in selecting the base curve.
- Wherever possible avoid the use of topical anaesthetics as this may mask the pain associated with a poorly fitting lens.
- The lens fit should be assessed after approximately 20 minutes and ideally again after approximately 60 minutes (owing to lens dehydration effects).
- A well fitting TCL should have good corneal coverage with appropriate mobility characteristics for the underlying condition being managed.

Common indications :

Bullous Keratopathy
Material: Hydrogel
Diameter: 14.5mm
Base curve: 2.5D flatter than K
Water content: 85%
Power: Plano

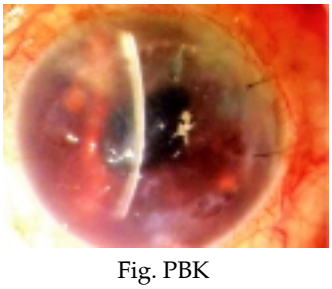


Fig. PBK

Filamentary Keratitis
Material: Hydrogel
Diameter: 14.5mm
Base curve: 3- 4D flatter than K
Water content: 69- 74%
Power: Plano

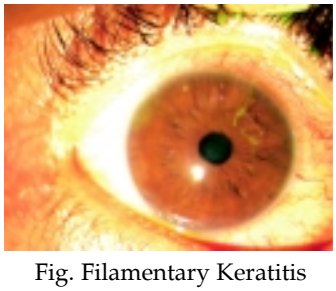


Fig. Filamentary Keratitis

Dry Eye

Material: Hydrogel
Diameter: 14.5mm
Base curve: 3- 4D flatter than K
Water content: 38-45%
Power: Plano

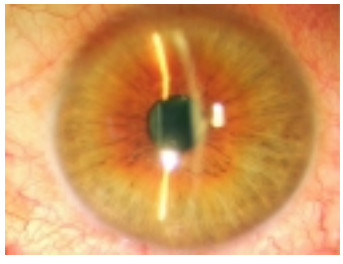


Fig. Dry Eye

Persistent epithelial defects/ Post operative
Material: Hydrogel
Diameter: 14.5mm
Base curve: 2.5D flatter than K
Water content: 38-45%
Power: Plano

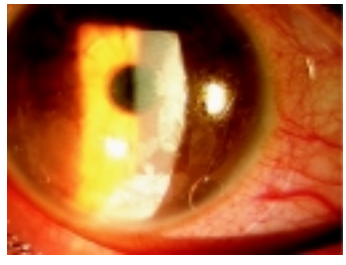


Fig. PED

Complications of TCL

These are:

1. Corneal oedema
2. Microcyst formation
3. Decrease corneal sensation
4. Neovascularization
5. Giant papillary conjunctivitis
6. Bacterial Keratitis: Some of the pathogens such as Acanthamoeba, Pseudomonas, Serratia and other Gram-Negative bacteria in particularly are very capable of adhering to contact lenses and causing bacterial keratitis.
7. Pannus formation
8. Tight lens syndrome

Assessment of risk versus benefit

i. Prescribe topical antibiotics as the risk of infection is high, especially in diabetics and patients with dry eye.

ii. A new lens is always better than a lens that has to be cleaned and reinserted. It is advisable to change TCL after 5 nights of wear.

iii. Patient education is an essential in therapeutic lens practice as it is in all forms of contact lens fitting. The education may often have to include other members of the patient's family.

iv. TCL practice can be rewarding as it can lead to dramatic improvements for the patient in reducing discomfort and aiding the healing process. However, in patients with bad ocular hygiene, it should be avoided in order to prevent corneal infection.

Reference:

1. **Gary N. Foulks**. Therapeutic contact lenses: *The Armamentarium. Review of Ophthalmology* 2003; 10: 1-5.
2. **Kokolakis S, Baltatzis S, Zafirakis P, Livir- Rallatos G et al.** Twelve years continuous wear of the same therapeutic soft contact lens: A case report. *European Journal Ophthalmol* 1999; 9: 312-4.

!! Congratulations !!

- **Dr. Harish Pathak & Dr. Vijay B. Wagh** Senior Resident R.P. Centre for Ophthalmic Sciences, AIIMS, for winning the Oculoplasty Conference, OPAI-2004 Quiz at Guwahati.
- ***Dr. Sandhya Makhija :*** For successful fellowship of International Council of Ophthalmology (FICO) at University Hospital, Ghent, Belgium in : "Retina ", for three months.
- ***Dr. Vivek Gupta :*** For successful three months observership in "Anterior Segment" at the University Hospital, Ghent, Belgium.
- ***Dr. Ashok Garg :*** Medical Director of Garg Eye Institute & Research Centre, Hisar (Haryana) for being awarded Prestigious Gold Medal by International Academy of Ophthamology during their Vth International Conference of Eye Advances held at Mumbai Aug.,2004.
- ***Dr. Shishir Agarwal :*** For being reviewer of Journal of Cataract & Refractive Surgery & American Journal of Ophthalmology.

DOS Credit Rating System Report Card

DCRS July 2004 – Army Hospital (R&R)

Total No. of Delegates	83
Delegates from Out side (N)	75
Delegates from Army Hospital (n)	8
Overall assessment by outside delegates (M)	610.5
Assessment of case presentation-I (Dr. Lt. Col. R. Maggon) by outside delegates	549
Assessment of case presentation-II (Dr. Lt. Col. (Mrs.) Madhu Bhaduria) by outside delegates	541.5
Assessment of clinical talk (Dr. Col. Ajay Banajee) by outside delegates	572.5
Rejected Form Army Hospital (n)	2
Rejected Form Out side (N)	2

DCRS August, 2004 – Sir Ganga Ram Hospital

Total no. of Delegates (Valid DCRS forms)	86
Delegates from Out side (N)	76
Delegates from Sir Ganga Ram Hospital (n)	10
Overall assessment by outside delegates (M)	552
Assessment of case presentation-I (Deepti Manocha) by outside delegates	475
Assessment of case presentation-II (Dr. Piyush Kapoor) by outside delegates	498
Assessment of clinical talk (Prof. H.K. Tewari) by outside delegates	571
Total no. of invalid DCRS forms	NIL

Preoperative Assessment of Lasik

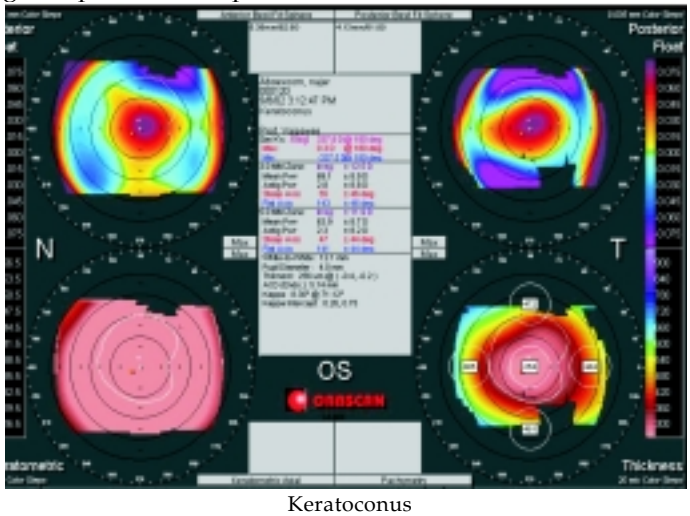
Arun Singhvi MD, **Rajesh Sinha** MD, FRCS, **Jeewan S. Titiyal** MD, **Rasik B. Vajpayee** MS, FRCS Ed

LASIK (Laser in situ keratomileusis) has become a common technique in refractive surgery over the past one decade. The initial enthusiasm has been replaced by a more conservative approach to prevent post operative LASIK complications. Every patient coming for LASIK surgery should be screened thoroughly. A comprehensive history, clinical examination and investigations are part of every preoperative assessment to ensure identification of any risk factor leading to complications.

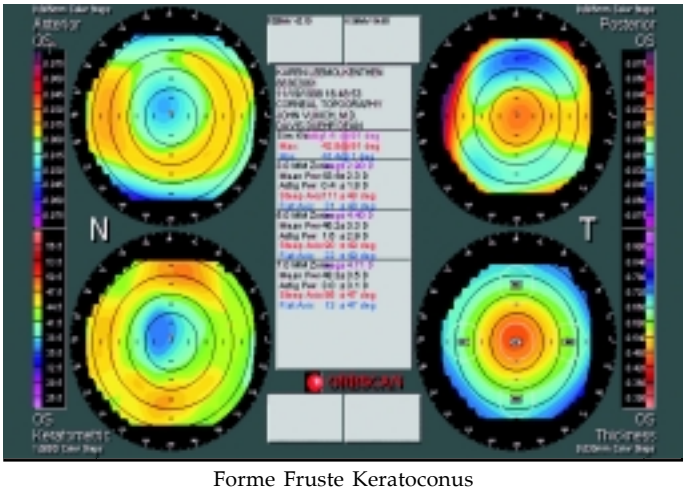
History

Age – The refractive error rarely stabilizes below 21 years of age. Though the usual cut off age for patients is kept at 18 years, it is better to wait till the early 20's.

Stable Refraction – Refractive error should be stable with no change in power (not more than 0.5D) for at least 1 year. Contact lens wear should be discontinued for at least one week in case of soft contact lens and four weeks for RGP (Rigid Gas Permeable) lens users prior to evaluation for LASIK.



Keratoconus



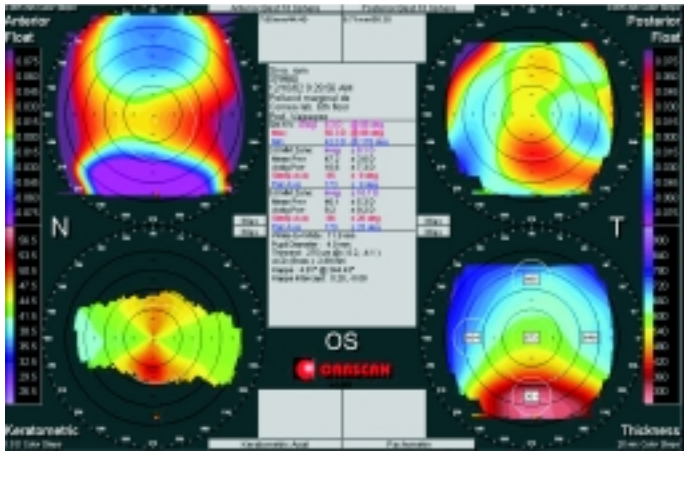
Forme Fruste Keratoconus

Previous Ocular Surgery – History of any retinal detachment surgery using buckle and encircling band requires extremely cautious approach for LASIK as there is risk of inadequate creation of suction pressure. LASIK has to be deferred for a long period in patients with operated radial keratotomy, post keratoplasty patients, after cataract surgery till wound stabilizes.

Previous Keratitis – LASIK should be avoided in eyes with dry eye state and with a recent or past history of microbial keratitis even those outside visual axis.

Pregnancy and Lactation are relative contraindications for LASIK because of usage of medications especially during early pregnancy.

Systemic Diseases like Sjogren syndrome, Diabetes mellitus, Rheumatoid arthritis and other collagen vascular disorders are relative contraindications. Any family history of keratoconus may warn for post operative keratectasia and is a contraindication. Persons with high level of visual performance under mesopic conditions, like aircraft pilot may experience glare if they have larger pupillary diameter and are thus contraindication for LASIK surgery.



Examination

Refraction and Visual Acuity

Uncorrected and best corrected visual acuity (BCVA) both for near and distance should be recorded. A cycloplegic

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refraction should be performed. The maximum degree of refractive error that can be treated varies for different types of refractive error and several other factors like corneal thickness, type of surgery. Usually accepted guidelines are

- Myopia up to -12 D
- Hypermetropia up to +5D
- Astigmatism up to 4D

Slit Lamp Examination: Examination of eyelids, tear film, cornea, intraocular pressure, and lens is essential to rule out various eye diseases like blepharitis, meibomianitis, blepherophimosis, dry eyes, corneal dystrophies, corneal ectasia, keratitis, scleritis, glaucoma, cataract etc. Corneal vascularization of greater than 1 mm from limbus requires selection of a smaller suction ring.

Pupil Examination-

Pupillary diameter should be measured in every case and is an important part of preoperative work up. Mesopic and scotopic pupillary size should be measured using

- Heidelberg Infrared Pupillometer (ideal)
- Humphrey's Videokeratography
- Goldmann Perimeter – Mesopic Pupillary size
- Octopus Perimeter
- Transparent ruler

Larger pupillary diameter requires a larger ablation zone otherwise it can give rise to significant glare post operatively. Ablation zone should be planned according to the mesopic pupillary size. Laser should be planned in such a way that the Functional optic zone (FOZ) should be more than the mesopic pupil size. Functional optic zone (FOZ) is 25% less than the ablation diameter.

Posterior Segment Examination

Dilated fundus examination for any posterior segment lesion is very essential especially in high myopes where peripheral retina is screened for retinal tear or lattice degeneration, which may result in retinal detachment post LASIK surgery. Prophylactic cryopexy should be done in such cases and LASIK surgery should be postponed for at least 6 weeks.

Investigations

Keratometry – Keratometry readings are used in conjunction with corneal topography. It helps to pick up the cases of keratoconus, flat corneas (<40D), steep corneas (>46D), corneal astigmatism cases to prevent intraoperative and post operative LASIK complications.

Videokeratography- Anterior and posterior corneal surface mapping is done with ORBSCAN II topography system. Both anterior and posterior elevations are determined and localized areas of steepening are also looked at. To prevent post LASIK keratectasia following are considered as exclusion criteria:

- Keratometry of > 47D
- Inferior – Superior Keratometry difference > 1.5D
- Pachymetery – LASIK in thin corneas may lead to iatrogenic keratectasia so preoperative corneal thickness measurement is very essential in every patient. Corneal thickness can be measured by using
- Ultrasonic pachymetry
- ORBSCAN
- Optical Coherence Tomography (OCT)

Ultrasonic method is more reliable than pachymetry by ORBSCAN. LASIK is contraindicated in eyes with less than 500µm of corneal thickness. A treatment algorithm is designed in such a way that a residual corneal stromal bed thickness of at least 250µm, (preferably 300 µm) is ensured after the ablation to prevent post LASIK corneal ectasia.

Contrast sensitivity measurement is essential in every patient and it should be explained to the patient that a decrease in contrast sensitivity occurs in early postoperative months and more so in high myopes. Measurement of contrast sensitivity can be done by using

- Cambridge gratings
- Pelli Robson Chart
- CVS 1000 Contrast Sensitivity Test (Vector vision)

Patient Counselling

One should understand the expectations from the surgery. Are they realistic? Inappropriate and unrealistic expectations of any refractive procedure including those from LASIK are the most common cause of dissatisfaction in patients. One should be explained about certain facts about LASIK:

- LASIK is a surgical, irreversible procedure, which is an alternative to contact lenses / glasses. LASIK does not prevent the natural progression of refractive error.
- LASIK surgery involves destroying a part of cornea making it mechanically weaker in comparison to its original strength.
- LASIK might require repeated enhancements due to regression. Every enhancement is associated with increased risk of intraoperative and postoperative complications.
- LASIK cannot prevent or cure the retinal associations of high myopia.

Polymerase Chain Reaction

Vijay B Wagh MD, DNB, FRCS, **Harish Pathak** MD, DNB, **Niranjan Nayak** MD

PCR is a new molecular biology technique which enzymatic amplification of specific sequence of DNA. Kary B. Mullis & Co workers described this technique in 1985.

Technique

i. The first step in PCR involves the identification of the target DNA sequence to the amplified.

ii. For this target DNA sequence a complementary DNA sequence, which is a set of complimentary nucleotide primer (single stranded), is designed and synthesized. This primer is 18 -22 nucleotide in length and this sequence is very critical for specificity.

iii. The tissue sample processed and the entire DNA present in it is extracted. The sample DNA is added to a small tube along with two primers, the enzyme taq polymerase, all four deoxynucleotides (dATP, dGTP dTTP & dCTP) in an appropriate amplification buffer. The enzyme taq polymerase is a thermostable enzyme obtained from a *Thermus aquaticus* a thermophilic bacterium.

iv. The tube is placed in a thermocycler, which is programmed to cyclically increase and decrease the temperature for a specified number of cycles.

v. The reaction occur in 3 steps :

   a. **Denaturation –** At 94°C the double stranded DNA from the original sample separates.

   b. **Annealing** -At 40-60°C the primers attach to specific site on target DNA

   c. **Elongation –** At 72°C the DNA polymerase enzyme in mixture begins elongation of the primer to produce complementary copies of target DNA.

vi. This cycle is then repeated and DNA strand synthesized from the primer itself act as template for another primer to bind in next cycle.

vii. On an average the cycles are repeated 30-40 times to produce millions of copies of target DNA sequence originally present in the sample.

viii. **Electrophoresis** - The reaction mixture is then electrophoresis through aqueous gel and stained with ethidiam bromide. Target DNA can be identified by a band on the gel at the molecular weight predicted by the length of the targeted DNA segment.

ix. More specification can be achieved by blotting the gel into the membrane of nitrocellulose or nylon for hybridization with a known probe (Southern blot). This can than be photographed to provide permanent documentation of the result.

Variations in techniques of PCR

1. **Nested PCR:** In a PCR an inner and an outer set of primers are used. The PCR is first performed using outer set. A portion of the first amplification is then reamplified using the inner set of primers. This technique has greater sensitivity for detection of pathogen *but may yield increased false positive result*.

2. **RT PCR –** By RT PCR mRNA sequence can be amplified. First, DNA is obtained from the mRNA by reverse transcriptase. This DNA is then modified using the regular PCR technique.

3. **Real time PCR –** Real time PCR allows real time quantitative analyses of reaction products by monitoring of accumulation of a fluorescent DNA interacting agent. This allows for discrimination of commensal and low level contaminants.

Limitations of PCR

1. **Sensitivity**: The extremely high sensitivity of PCR can produce false positive results. Carryover of DNA via pipette, or even viral shedding by the laboratory technician or internal contamination from latent host DNA. Most patients in developing countries like India is exposed to tubercle bacillus and because and bacillus DNA might remain latent in subset of white blood cells. Any PCR reaction on a patient sample containing while blood cell well yields a false positive result. So the result of PCR must be kept in clinical content.

2. **Specificity**: Sequence polymorphism between strains of the organism can lead to poor priming and false negative PCR. Use of multiple primer sets for each organism under consideration can also decrease the chance of false negative result from a polymorphism in the primer sequence.

3. PCR does not distinguish *viable* from the nonviable organism.

4. The PCR results are not yet truly *quantifiable*, it is therefore difficult to assess the relevance of a positive PCR especially in location such as conjunctival sac which normally harbor bacterium.

5. Similarly PCR cannot differential between *active* and latent infection.

6. A few culture media with suffice to detect and grow most organism, but with PCR, the technique well have to repeated for each organism that is suspected.

7. PCR can detect only these agents for which the DNA sequence and primers are known.

8. PCR does not provide cellular morphology and localization.

How to avoid the pitfalls

1. Strict adherence to rigorous laboratory technique can minimize risk of contamination.
2. The use of deoxyuracil base with uracyl DNA glycosylase that degrade previous PCR products, which decreases the likelihood of carryover contamination.
3. Negative and positive control samples should be tested with each diagnostic PCR to check contamination.
4. Real time PCR by allows quantitative analysis by allowing quantitative analysis can allow for discrimination of commensal and low level contaminants.
5. RT-PCR by detecting mRNA helps in differentiating active and latent infection
6. With PCR the technique well have to repeat for each organism that is suspected. One way to minimize this disadvantage is to use primer against DNA sequence that are conserved across species (i.e. Herpes group) and once detected use primer against the non conserved portion to differentiate within this group (i.e. HSV, HZV,CMV).

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Stichless Trabeculectomy

Roop MD, **Sangeeta** MS

Introduction

The aim of filtering surgery in glaucoma is to make an alternate channel for aqueous outflow without compromising the structural and functional integrity of the eye. Several techniques and their variants have been used for this purpose. Here we present a fast, simple, reproducible and easy to learn technique of trabeculectomy which we are using presently. At the outset we confess that we are not glaucoma super-specialists and this effort is basically for ophthalmologists who are more at ease while doing cataract surgery than while doing glaucoma surgery.

Technique

Fist of all fornix based flap is dissected at limbus, preferably leaving 1 mm frill of conjunctiva attached to the limbus. The length of conjunctival flap is about 7 mm and it is dissected 5 mm posteriorly. Any bleeding points are cauterized with mild cautery. (Fig-1)

A scratch incision is made 1.5-2 mm behind the sclerolimbal junction, (External incision Fig- 1 and Fig-5) as we make scleral incision during phacoemusification. This incision is about 5 mm long and its depth is about half of the sclera. A scleral pocket is dissected with a crescent knife till just at the point of clear cornea. Now a side port incision is made (Fig.-2) and viscoelastic is injected to deepen the chamber.

With corneal forceps the edge of this superficial scleral flap is lifted and a scratch insion is made at the sclerolimbal junction, (Internal incision Fig. 2 and Fig.-5) for the full thickness of the deeper sclera. The length of this incision is about 2mm. Small amount of viscoelastic is injected into the AC. This confirms its communication with AC and also deepens the AC for the next step. To cut the anterior end of deeper flap a keratome is entered into AC through the clear corneal end of the scleral tunnel as we do in Phaco. (Fig.-3) Now the anterior and posterior incisions of deeper flap are ready and they are joined by cutting the sides either with the help of a fine Vanna' ssissors or 1.2 mm of keratome. This step is slightly difficult as we have not cut the sides of superficial flap. But by having the length of superficial flap about 5 mm we can lift and retract the edge of superficial flap and cut the sides of deeper flap a bit by bit.

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After the excision of deeper tissue the iridectomy is done in usual way. (Fig. 4) Now ringer lactate is injected in the AC to wash the viscoelastic and also to confirm the adequacy of the filteration. As the last step conjunctival flap is co-apted at limbus with cautery at two points.

Advantages of the technique

It is our clinical impression that in routine trabeculectomy filtration usually does not occur from all the edges of scleral flap. It occurs preferentially from single side where the resistance to aqueous outflow is the least. This functional part of scleral flap may be at any location in routine trabeculectomy. In our technique, as we do not cut the sides of superficial scleral flap and so the filtering edge is always the posterior one and aqueous flow is directed only posteriorly and this is the ideal outcome.

As the aqueous is directed only posteriorly, the fornix based conjunctival flap works very well in this technique with all its advantages. As the conjunctiva has adequate area anterior to the filtering edge it adheres to the sclera at limbus with the help of cautery and patching for on day. Thus stiches are neither required for sclera nor for conjunctiva. This leads to very less inflammation post operatively and the bleb which forms is diffuse, thick walled and flatter. The patients are much more comfortable post-operatively. This technique is very fast, does not require any additional instrument and thus very cost-effective. Though it is early to say but we feel the incidence of intra-operative complications especially expulsive haemorage would be much less with this technique and success rates are comparable to the existing techniques. As the surgical steps are very similar to Phacoemulsification surgery this can be easily mastered by any cataract surgeon. Another advantage of this technique is that it is much easier to use in patients requiring filtering surgery to be done in inferior or nasal quadrants. This can also be easily combined with cataract surgery.

The biggest advantages of this technique is the number of variations one can do with it. In the superficial scleral flap one may not make any side incisions, as we do, or one can make the side incisions upto the limbus and suture it as in routine trabeculectomy. As a compromise between these two ways one can make the side incisions for 1-1.5mm only at the posterior edge of the flap, it makes the retraction of

superficial flap much easier for the direct visualization of deeper dissection without compromising the basic advantages of the present technique.

One can vary the length of the deeper block of the tissue excised to vary the size of internal opening as per the requirement of the particular patient. We feel that internal opening of even 1.5mm is sufficient but can be enlarged upto 3 mm if one feels that filtration is not adequate. One can check the adequacy of the internal opening by injecting ringer lactate from side port.

The superficial flap may be left unsutured or if one feels that there is risk of overfilterations one can suture it either by a single cross stich or by two interrupted sutures. One can titrate the tightness of sutures for adequate filtration. One can also apply releasable sutures if one wants. Same is true for conjunctival flap, one can just cauterize it or can suture it at limbus with interrupted or continuous suture.

Conclusion

We think that this technique of stichless trabeculectomy with all its variation can serve the interest of all our glaucoma patients requiring filtering surgery. At the same time it would make glaucoma surgery as enjoyable as cataract surgery for all the ophthalmologists.

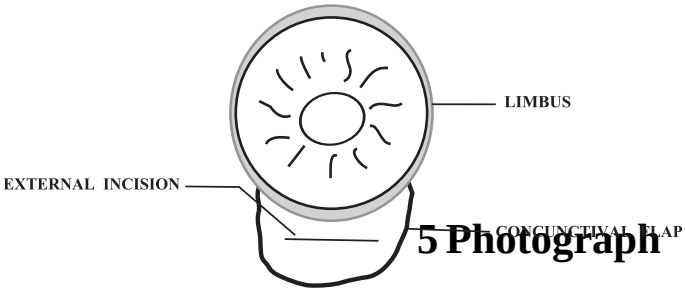


FIG-1

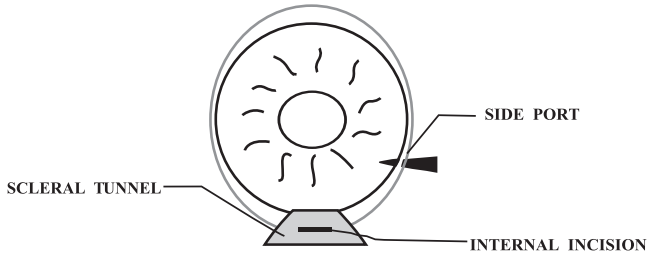


FIG-2

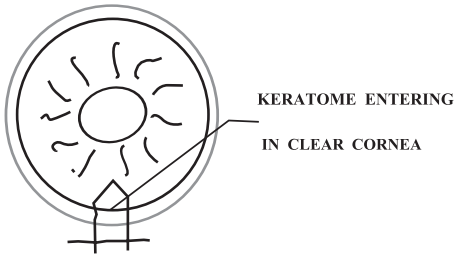


FIG-3

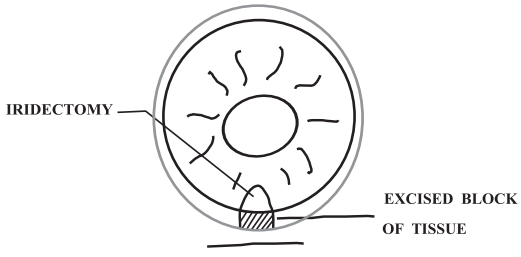


FIG-4

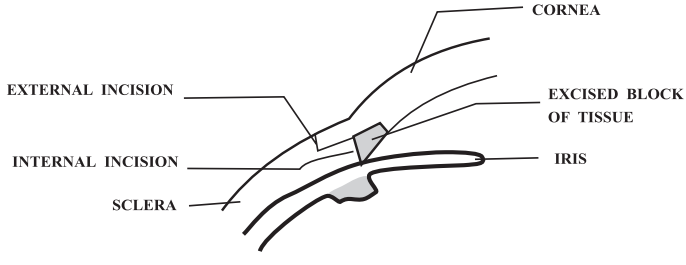


FIG-5

5 Photograph

Fig. 1-5 Steps of Stichless Trabeculectomy

Ocular Effects of Anaesthetic Agents

Renu Agarwal MD, **Dilip Shende** MD

Among all the senses, vision is considered the most important. Except for the cornea, no other part of the eye can be replaced. Hence it is important to take care of original pair of eyes. Anaesthetic management can contribute to the success or failure of ophthalmic surgery. A recent analysis has found that 30 percent of eye injuries are associated with anaesthesia characterized by patient movement during ophthalmic surgery resulting in blindness. Most patients undergoing ophthalmic surgery are at the extremes of life i.e. children and elderly. Elderly ophthalmic patients are often poor risk cases having coexisting diseases i.e. hypertension, IHD, diabetes mellitus, chronic lung diseases and concomitant drug therapy.

Premedicants

Anticholinergic drugs

Topically administered anticholinergic drugs (i.e. atropine) result in pupillary dilatation, which may precipitate angle closure glaucoma. However, premedication doses of systemically administered atropine are not associated with intraocular hypertension even in patients with glaucoma.

Benzodiazepines

Orally administered diazepam (0.2mg/kg) has no effect on intra ocular pressure (IOP), however when diazepam (0.15mg/kg) and equipotent dose of midazolam are given intravenously, this may reduce IOP.

Opioids

Intravenous administration of potent opioids alfentanil and fentanyl results in a significant reduction in IOP, the effect of former is somewhat greater. Opioid given intramuscularly produce only a moderate reduction in IOP. A combination of fentanyl and droperidol also reduces the IOP by 12 % in normocapnic patients.

Induction Agents

Barbiturates

Intravenous barbiturates are safer to use as anaesthetic induction agents for ophthalmological surgical procedures, including those for open eye injuries. Intraocular pressure decreases by about 40 % after an induction dose of thiopental or methohexital is injected, by their central depressive effect on diencephalic control of IOP and by improved outflow of aqueous humor.

Propofol

Propofol produces a greater reduction in IOP and limits the increase in IOP during intubation as well.

Etomidate

Etomidate produces greater reduction in IOP than does thiopentone even though it is associated with muscle movements.

Ketamine

The reports about the effects of ketamine on IOP are conflicting. Recent data indicates that ketamine given after premedication with diazepam and meperidine does not affect IOP and that intramuscularly administered ketamine may even lower IOP in children. Its use is limited in ophthalmology because of side effect such as nystagmus with contraction and squeezing of the eyelids.

Inhalational Anaesthetic Agents

Inhalational anesthetics decrease IOP in proportion to the depth of anaesthesia. The reduction in IOP is greater under conditions of controlled ventilation. The decrease has multiple causes: A drop in blood pressure reduces choroidal volume; relaxation of the extraocular muscles lowers wall tension; pupillary constriction facilitates aqueous outflow; and an effect on the hypothalamic centers in the brain.

In spontaneously breathing patients, halothane reduces IOP by 18-33%. Enflurane reduces IOP by 21-40% in spontaneously breathing patients in concentration of 1-5%. Isoflurane has been shown to reduce IOP from control values to the same degree as halothane.

Nitrous oxide (N_2o)

Ophthalmologist sometimes inject a small bubble of gas into the vitreal cavity during surgical reattachment of the retina. Their goal is to have a long acting bubble of stable size to hold the retina in place. The gases commonly used, sulfur hexafluoride (SF_6) and carbon octofluorine (c_3f_8), are inert, insoluble in water, and poorly diffusible. Nitrous oxide is 117 times more soluble than SF_6 and rapidly enters the gas bubble. If administration of N_2O continues after injection of gas into the vitreous cavity, the size of the injected gas bubble rapidly increases to 3 times its original size. Within 19 minutes, IOP increases from 14 to 30mmHg, and both bubble size and IOP decreases (from 29 to 12mmHg) within 18 minutes of discontinuation of N_2O. This rapid and wide

variation in bubble size during general anaesthesia may adversely affect the outcome of surgery.

Because washout of N_2O from the lung is 90% complete within 10 minutes, administration of N_2O should be discontinued at least 20 minutes before an intravitreal injection of gas. Bubble size and IOP should then remain stable. Some anaesthetist avoid N_2O altogether when intravitreal injection is planned. SF_6 gas bubble remains for at least 10 days. Other intravitreal gases may remain for as long as 21 to 28 days. Nitrous oxide should be avoided in any patient returning for surgery within 3 to 4 weeks of intravitreal injection of gas. A second exposure to N_2O might cause reexpansion of the bubble and elevate IOP, resulting in occlusion of retinal artery and loss of vision.

Neuromuscular Blocking Agents

Succinylcholine

Intraocular pressure increases by 5 – 15 mm Hg after injection of succinylcholine. The increase in IOP is maximal within 1 minute and is almost dissipated by 5-6 minutes.

Increase in IOP is principally through prolonged contracture of extraocular muscles. Unlike other skeletal muscle, extraocular muscles contain cells with multiple neuromuscular junctions. Repeated depolarization of these cells by succinylcholine causes the prolonged contracture. The resulting increase in IOP may have several effects. It will cause spurious measurements of IOP during examination under anaesthesia in glaucoma patients, potentially leading to unnecessary surgery. A rise in IOP may cause extrusion of ocular contents through an open surgical or traumatic wound. A final effect of prolonged contracture of the extraocular muscles is shown as an abnormal forced duction test for 20 minutes. This maneuver evaluates the cause of extraocular muscle imbalance and may influence the type of strabismus surgery performed.

Congestion of the choroidal vessels and distortion of the globe with axial shortening may also contribute to the rise in IOP.

Precurarization with non depolarizing blockers has little or no effect on this increase, so that large doses of non depolarizing neuromuscular blocking drugs are recommended in the presence of open eye injuries.

How ever it must be appreciated that other factors, such as inadequate anaesthesia, elevated systemic blood pressure, and insufficient neuromuscular blockade during laryngoscopy, and tracheal intubation might increase intraocular pressure more than succinylcholine.

Nondepolarizing Muscle Relaxants

These agents either reduce IOP or have no effect on it. Tubocurarine reduces IOP whilst pancuronium and alcuronium have little effect. Atracurium has no significant effect whilst vecuronium produces a small but significant reduction.

Anaesthetic Procedure and Intra Ocular Pressure

Laryngoscopy and endotracheal intubation are the anaesthetic related practices most likely to increase IOP significantly i.e. at least 10- 20mmHg. The mechanism is not clear but probably relates to sympathetic cardiovascular responses to tracheal intubation.

Anaesthesia for Penetrating Eye Injuries

This is a challenge for anaesthesiologist as a patient with a penetrating eye injury and full stomach confronts special problems. These patients require prevention of regurgitation and aspiration of gastric contents, in addition to measures to avoid any increase in IOP. If possible, early administration of histamine H_2-receptor antagonist such as cimetidine (2mg/kg IM) with metoclopramide (0.15mg/kg IM) will decrease gastric acidity and volume, respectively, and provide some protection.

Prior to rapid sequence induction of anaesthesia, precautions may be taken to blunt the cardiovascular and IOP responses to laryngoscopy and tracheal intubation. Intravenous administration of lidocaine (1.5mg/kg) and of sufentanil (0.1µg/kg), 3 to 5 minutes before induction, may help in attenuating the increase in IOP after tracheal intubation. A beta adrenergic receptor blocking drug such as labetalol (0.03mg/kg IV) may also help in blocking the cardiovascular response to tracheal intubation, especially in patients with angina or hypertension.

An adequate dose of thiopental or propofol will ensure adequate depth of anaesthesia during tracheal intubation. The choice of succinylcholine (after pretreatment with d-tubocurarine, 0.05mg/kg) offers the advantage of rapid onset and brief duration of neuromuscular blockade and adequate induction conditions. Although IOP may increase with this method, no published reports have described further damage after rapid sequence induction of anaesthesia with d-tubocurarine, thiopental and succinylcholine.

Because nondepolazising muscle relaxants reduce IOP, a modified rapid sequence technique using preoxygenation, a large dose of nondepolarizing muscle relaxants, thiopental and application of cricoid pressure for 2 minutes has been advocated for open eye surgery. During general anaesthesia for open eye surgery, depth of anaesthesia must be adequate to ensure lack of movement or coughing. Neuromuscular blockade must be profound to prevent coughing caused by accidental carinal stimulation.

Anaesthesia for ophthalmic surgery requires

considerable experience and should not be taken lightly. Strict attention to details will minimize morbidity and mortality attributable to anaesthesia.

References

1. Al-Abrak MH. Diazepam and intraocular pressure. British Journal of Anaesthesia 1978; 50: 866.
2. Holloway KB. Control of the eye during general anaesthesia for intraocular surgery. British Journal of Anaesthesia. 1980; 52: 671- 9.
3. Joshi C, Bruce DL: Thiopental & succinylcholine action on intra ocular pressure. Anesth Analg 1975; 54: 471.
4. Libonati MM, Leahy JJ, Ellison N. The use of succinylcholine in penetrating eye injuries. Anesthesiology 1985; 62: 637.

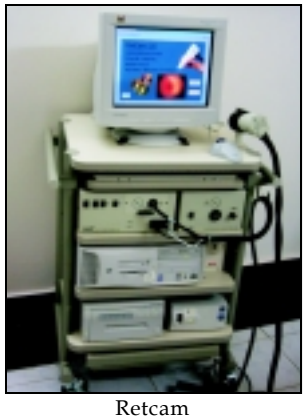
Monthly Meetings Calendar For The Year 2004-2005

1st August, 2004 (Sunday) *Army Hospital (R&R)*
29th Auguest, 2004 (Sunday) Sir Ganga Ram Hospital
25th September, 2004 (Saturday) **Hindu Rao Hospital**
30th October, 2004 (Saturday) R.P. Centre for Ophthalmic Sciences
21st November, 2004 (Sunday) **DOS Midterm Conference**
27th November, 2004 (Saturday) Dr. Shroff's Charity Eye Hospital
18th December, 2004 (Saturday) Venu Eye Hospital & Research Centre
29th January, 2005 (Saturday) Safdarjung Hospital
26th February, 2005 (Saturday) M.A.M.C. (GNEC)
27th March, 2005 (Sunday) Mohan Eye Institute
2nd & 3rd April, 2005 (Saturday & Sunday) **Annual DOS Conference**

Retcam

Raj Vardhan Azad MD, FRCSEd, **Nikhil Pal** MD, **Parijat Chandra** MD, DNB, **Yog Raj Sharma,** MD

The RetCam (Retinal Camera) is a real time wide angle digital imaging system for viewing pediatric eyes manufactured by Massie Research Laboratories, Dublin CA. Documenting pediatric fundi for diagnosis and follow up has been a difficult task. Previous cameras had smaller fields and took longer times to get limited information. The Retcam images a large 130 degree field of view in a single picture instantly, giving a fantastic field of view.



Retcam

Retcam fills the need for wide-field imaging and is fully digital enabling efficient assess-ment and monitoring. Nearly the entire retina is documented with only five images. Real-time imaging display provides immediate feedback. Inexpensive digital image storage eliminates film. One is able to retrieve and manage patient information with built-in image database and also transmit images to colleagues.

Imaging with Retcam

Applications

The Retcam can be used for diagnosis, follow up and documentation of pediatric vitreo-retinal status in disorders like Retinopathy of prematurity (ROP), infant head injuries, blunt trauma to the eye when there are no external signs, birth trauma, retinoblastoma, meningitis and septicaemia, metabolic disorders (such as Tay Sachs, Niemann-Pick). Other major advantages are the facility of anterior segment imaging, gonioimaging for glaucomatous damage / iris lesions and fluorescein angiography.

Features

The major components of the Retcam are the camera control unit, computer system module, imaging camera, 17′ monitor, foot pedal control, fluorescein light source, keyboard, trackball, transformer and colour photo printer; all of which are incorporated in a single compact mobile unit. It is helpful to examine both the anterior and posterior segment, with fast retinal examination with total documentation with as few as 5 photos. A special filter and light source enable fundus fluorescein angiography. It has advanced image management solutions with a 9.4 GB DVD RAM for permanent image storage. A comprehensive database record is transferable via LAN / Internet for telemedicine purposes.

Wide field 130 degree Lens

High magnification 30 degree lens

Portrait lens

Many lenses are available to suit varied purposes during examination. The common lenses are the second generation wide angle 130 degree ROP lens, Standard Children's 120 degree lens, High magnification 30 degree lens, High contrast / Adult 80 degree lens and the flat field portrait lens. The wide field 130 degree lens is commonly used for ROP screening. Portrait lens is suitable for external imaging.

The Field-of-view is the instantaneous field-of -view (FOV) while the Field-of-regard (FOR) is the total field of imaging available with camera. The RetCam 120 has a large FOV and ready access to a superb FOR. With scleral depression the ora serrata can be imaged. Without depression, FOR is about 200 degrees (retina is about 225 degrees). The camera has remarkable image quality for a panoramic imaging system. The optical resolution is same as CCD pixel size (about 36 microns) at boundary and twice as good in central region. The image distortion is negligible. There is an excellent mapping of angle onto CCD coordinate.

Procedure

The procedure involves anesthetizing the eyes using proparacaine eye drops. A pediatric lid speculum is used to separate the eyelids. Fixation of the head is essential. A coupling solution like methylcellulose or viscous tear gel can be used over the cornea, which needs to be continuously replenished. The lens attached to the image camera is placed over the cornea and images clicked after suitably altering the position relative to the eye, depending on the part to be screened. Image capture and focusing is done via the foot control pedal. Older children may be given short term sedation for the procedure.

Benefits

- Mobile self contained system for use in the nursery, ICU, operating room.
- Ease of use by technicians or nurses

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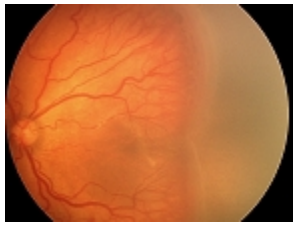
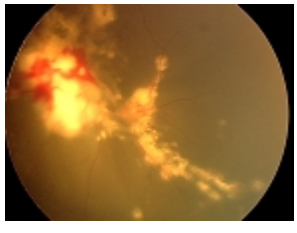
- Avoids stress and expertise of indirect ophthalmoscopy and indentation
- Eliminates inter-observer variability
- Teaching tool for residents and parents
- Easy case management with access to images, video clips, patient data, instant retrieval and side by side comparison

Retcam II

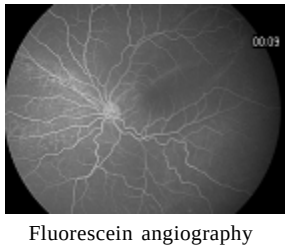
After the widespread use of Retcam 120, the Retcam II is the latest addition to the series with newer benefits like flat LCD Color display, frame by frame video review, video capture, unlimited options for comparisons, new multipurpose software and an inbuilt one piece unit. The heart of the RetCam II is a 3 CCD medical grade digital camera. An optional Dye-sublimation Color Printer is used for physical photographic output of the images for inclusion to the patient's report.



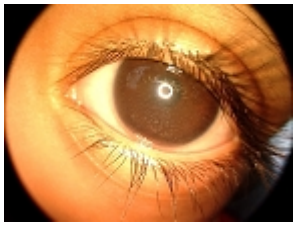
Retinopathy of prematurity



Retinoblastoma



Fluorescein angiography



External Imaging

Limitations

This current imaging system is not without limitations. Camera lens-cornea contact, need for lid speculum and technical limitation of the camera design itself make it difficult in photographing the peripheral retina in very small eyes. Pupillary dilation is extremely important as smaller pupils cause obscuring shadows that may diminish the quality of the image and real-time visualization is helpful in these instances.

The lack of stereopsis and some loss of magnification of retinal field in exchange for a wide-angle field of view also may be seen as a limitation. Future technical improvements may reduce these limitations, but they not seem necessary to detect referral-warranted ROP reliably.

Telemedicine

Remote screening can be done at centres where ROP screening facilities are not available. The experts do not need to travel to make services accessible and all children need not travel to tertiary centres for related queries. Longitudinal remote reading of digital photographs using the RetCam-120 system has excellent specificity and sensitivity in detecting referral-warranted ROP compared to indirect ophthalmoscopy. The use of digital imaging combined with telemedicine may increase the cost effectiveness of ROP screening. A successful telematic Project is underway in Bavaria for ROP screening. The use of computer algorithms paves the way for objective retinal vasculature quantification. It seems likely that in the future digital cameras, such as the RetCam will be used by non-ophthalmologists to capture images of the posterior pole that will then be subject to automated analysis to inform diagnosis and treatment.

Suggested Readings

1. Ells AL, Holmes JM, Astle WF, Williams G, Leske DA, Fielden M, Uphill B, Jennett P, Hebert M. Telemedicine approach to screening for severe retinopathy of prematurity: a pilot study. Ophthalmology. 2003 Nov; 110(11):2113-7.
2. Yen KG, Hess D, Burke B, Johnson RA, Feuer WJ, Flynn JT. Telephotoscreening to detect retinopathy of prematurity: preliminary study of the optimum time to employ digital fundus camera imaging to detect ROP. J AAPOS. 2002 Apr; 6(2):64-70.
3. Yen KG, Hess D, Burke B, Johnson RA, Feuer WJ, Flynn JT. The optimum time to employ telephotoscreening to detect retinopathy of prematurity. Trans Am Ophthalmol Soc. 2000;98:145-50; discussion 150-1.
4. Roth DB, Morales D, Feuer WJ, Hess D, Johnson RA, Flynn JT. Screening for retinopathy of prematurity employing the retcam 120: sensitivity and specificity. Arch Ophthalmol. 2001 Feb;119(2):268-72.
5. Lorenz B, Bock M, Muller HM, Massie NA. Telemedicine based screening of infants at risk for retinopathy of prematurity. Stud Health Technol Inform. 1999;64:155-63.
6. Schwartz SD, Harrison SA, Ferrone PJ, Trese MT. Telemedical evaluation and management of retinopathy of prematurity using a fiberoptic digital fundus camera. Ophthalmology. 2000 Jan;107(1):25-8.

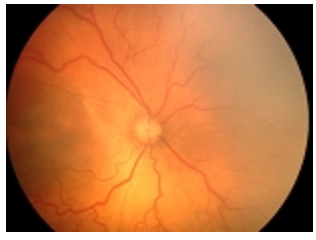


Fig. Plus Disease

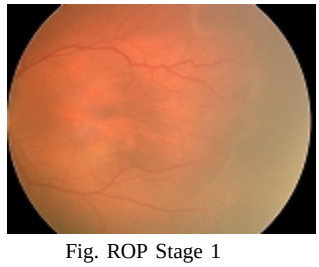


Fig. ROP Stage 1 Demarcation line

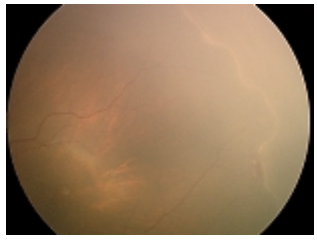


Fig. ROP Stage 2 Ridge

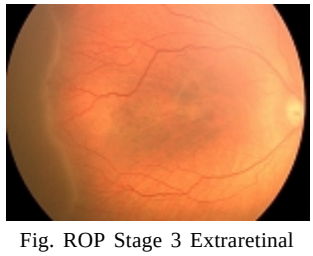


Fig. ROP Stage 3 Extraretinal fibrovascular proliferation

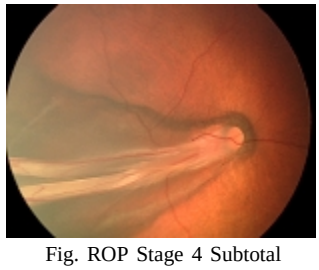


Fig. ROP Stage 4 Subtotal Tractional Retinal detachment

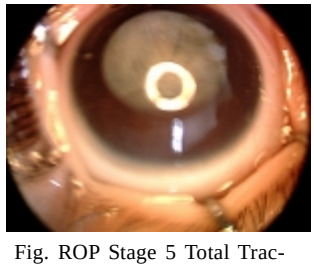


Fig. ROP Stage 5 Total Tractional Retinal detachment

Marfan Syndrome

Shailesh G.M. MBBS, **Jeewan S. Titiyal** MD, **Vijay B. Wagh** MD, DNB, FRCS, **Harish Pathak** MD, DNB

Marfan syndrome is by far the most common systemic disease associated with dislocated lenses.[1] It was described by Antoine Marfan in 1896. Marfan syndrome[2] is composed of a group of connective tissue disorders that exhibit characteristic skeletal, cardiovascular, and ocular abnormalities. Typical presentation is that of a tall individual with long, thin arms and legs, hypermobile joints, and a long face. Various studies show that it occurs in 4-6/10,000 births.[2] Skeletal involvement is seen in all & aortic involvement in 80% of patients. Lens subluxation occurs in 50-60% patients.

Genetics

Marfan syndrome is an autosomal dominantly inherited disorder with near complete penetrance but variable expressivities. 5 to 35% are new mutations and are associated with increased paternal age. There is abnormal biosynthesis of **fibrillin**, a 350 kd cysteine rich Glycoprotein which is a major constituent of microfibrils (present in connective tissue of suspensory ligaments of crystalline lens). Fibrillin locus (FBN 1) lies within long arm of chromosome 15 (15q21). Many manifestations of Marfan syndrome are age or maturation dependant. Cognitive performance is usually normal.

Systemic manifestations (* common)

I) Musculo-skeletal abnormalities

1. Dolichostenomelia (long, thin limbs)*
2. Arachnodactyly – long, spider like fingers
3. Arm span > height*
4. Upper segment of body (head to pubic bone) is shorter than lower segment.
5. Scoliosis* – most frequent and most debilitating of all
6. Pectus excavatum (funnel chest) *

   Pectus carinatum (pigeon chest)
7. Hyperextensible joints*

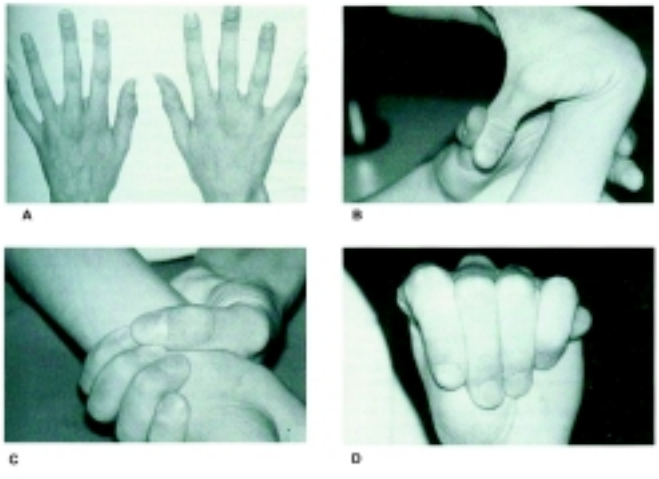
a) Thumb sign (Sternberg sign)

b) Wrist sign

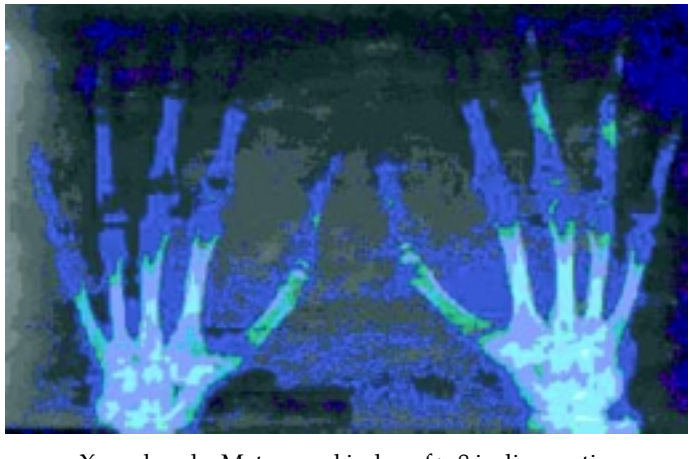
8. Repeated dislocation of hips, patella, clavicle*
9. High arched palate
10. Broad nasal bridge
11. Low set ears
12. Small jaw bones, Dental crowding
13. Inguinal hernias
14. Flat feet and foot deformities
15. Overlapping toes
16. Femoral fracture
17. Decreased reflexes
18. Decreased muscle tone with peripheral muscle wasting

II) Cardiovascular system

1. Mitral valve prolapse* – is common with midsystolic click and late systolic murmur



A = Arachnodactyly; B = Hyperextensibility;
C = Wrist sign; D = Thumb sign



X-ray hand – Metacarpal index of > 8 is diagnostic

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2. Transient ischemic attacks*
3. Retinal vascular emboli
4. Stroke*
5. Arrhythmias*
6. Bacterial endocarditis
7. Aortic root dilatation/rupture/aneurysm (on histologyàcystic medial necrosis)
8. Rupture of chordae tendinae
9. Mitral regurgitation*
10. Aortic involvement is the most common cause of death with average age of 32 years.
    - Echocardiography is diagnostic
    - Chest x-ray shows when there is extreme dilatation.

III) Cutaneous

1. Skin folds*
2. Stretch marks* (striae distensae) – often over buttocks, thighs and shoulders.

IV) Pulmonary – Rare

1. Spontaneous pneumothorax
2. Bullous emphysema
3. Sleep apnea

V) CNS

1. Dural ectasia like lumbosacral meningocele

VI) Ocular

Anterior segment	Posterior segment
1. Blue sclera	1. Retinal detachment - in 9% patients
2. Increased corneal diameter flat cornea	2. Peripheral retinal degeneration – Lattice, retinoschisis, retinal holes, white without pressure
3. Keratoconus	3. Retinal arterial occlusion
4. Iridodonesis	**Binocular and Others**
5. Reiger's anomaly	1. Strabismus – seen in 20% patients
6. Deep AC angle	2. Amblyopia
7. Heterochromic iris	3. Anisometropia
8. Miotic pupils	4. Nystagmus
9. Smooth iris (Iris transillumination à positive at base, seen in 10% patients)	5. Enophthalmos
10. Ectopia lentis	6. Colobomas
11. Secondary glaucoma	7. Down-slanting palpebral fissures
* Seen in 8% patients due to:	8. Brown tendon sheath syndrome
a) Lens dislocation	
b) Congenital angle anomaly	

2. Dilated cisterna magna
3. Learning disability
4. Attention deficit hyperactivity disorder
5. Association with schizophrenia

Ocular Facts :

- **Ectopia lentis** - is a major sign with bilateral displacement of crystalline lens seen in 50-60% patients with little effect on visual acuity. It is better than 20/40 in 60% patients.

a. Almost always supero-temporal direction usually occurring in-utero; but can occur in any direction[3]

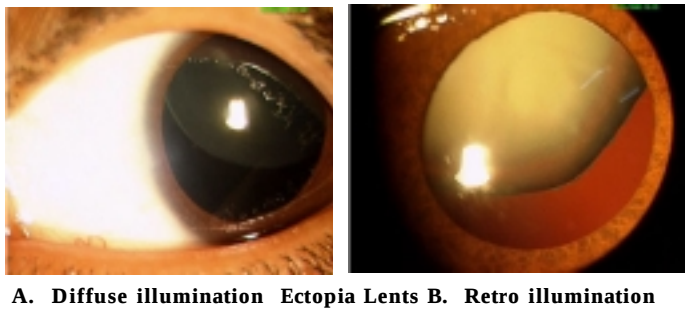
b. Incomplete & usually non-progressive

c. Accommodation is possible because zonules remain attached to lens

d. Lenticular astigmatism may be induced

- Increased axial length causes moderate to severe myopia with risk of spontaneous RD.
- Choroid may be thin, but staphylomas are rare.
- Relatively flat corneas are typical of Marfan syndrome

  Patients may have corneal thinning and opaque stromal matrix by confocal microscopy and orbscan.[6]
- Glaucoma association further stretches the globe which already has increased axial length causing RD.
- Pupils dilate poorly as dilator muscle is hypoplastic. Occasionally pupils are eccentric.
- Microspherophakia and cataract have been reported.
- Rieger anomaly – prominent anterior schwalbe's line, anterior stromal hypoplasia has been reported.



A. Diffuse illumination Ectopia Lents B. Retro illumination

- Acquired Brown syndrome – inflammation of microfibrillar fibers of superior oblique tendon is accompanied by diplopia and pain in upgaze.

Ectopia Lents Pathology :

- There is increased deposition of collagen and proliferation of smooth muscle cells.

Diagnostic Criteria (Ghent nosology) [4,5]

Criterion	Major	Minor
A) Skeletal system **Croteria**	• Pectus carinatum/excavatum requiring surgery • Arm span to height ratio > 1.05 • Reduced upper to lower segment ratio of < 0.86 (adults) • Positive wrist & thumb sign • Scoliosis > 20° or spondylolisthesis • Pes planus • Protrusio acetabuli ***4 of 7 major present**	• Facial appearance • Joint hypermobility • High arched palate • Pectus excavatum of moderate severity ***2 of 7 major or 1 of 7 major & 2 of 4 minor present.**
B) Ocular system	• Ectopia lentis ***Ectopia lentis present**	• Myopia • Flat cornea • Iris or ciliary muscle hypoplasia ***2 of 3 minor present**
C) CVS	• Aortic root dilatation/AR • Aortic dissection ***1 of 2 major present**	• Mitral valve prolapse • Annulus mitralis calcification • Pulmonary artery dilatation • Abdominal aortic dissection / dilatation ***1 of 4 minor present**
D) Pulmonary system	None	• Pneumothorax • Apical blebs (by CXR) ***1 of 2 minor present**
E) Skin	None	• Striae atrophicae • Incisional hernia ***1 of 2 minor**
F) Dura	• Lumbosacral dural ectasia (by CT/MRI)	None
G) Family	• First degree family member independently fulfilling diagnostic criteria • Mutation in FBN 1 known to cause Marfan syndrome	None

- Severe Marfan syndrome cases show decreased synthesis of type I collagen.
- Increased urinary hydroxyproline levels in some patients indicate increased collagen turnover.

Differential diagnosis [2,7]

1. Homocystinuria: It is a recessively inherited disorder caused by deficiency of cystathionine synthetase leading to accumulation of homocysteine and methionine. Affected persons have tall, thin habitus similar to Marfan syndrome patients but infrequent arachnodactyly. Lens dislocation is typically inferonasal and occurs in over 90% of these individuals.[10] Zonular fibers are usually broken in these patients with the loss of accommodation. Secondary angle-closure glaucoma may occur by lens incarceration in the pupil. Myopia and retinal detachment is uncommon. In addition, patients have osteoporosis, mental retardation, blond hair with malar flush, and thromboses in any vessel.
2. Idiopathic MVP
3. Familial dissecting aortic aneurysm
4. Stickler syndrome (hereditary arthro-ophthalmopathy)
5. Pseudoxanthoma elasticum
6. Shprintzen-Goldberg syndrome (Craniosynostosis – Marfanoid habitus)
7. Fragile X-syndrome
8. MASS phenotype (mitral, aortic, skin, skeletal).

Management

Periodic referral to a interdisciplinary center is important.

CVS:

1. ECG every 6 months
2. Echo-annually/biannually
3. Surgery if aortic root is > 6 cm
4. Beta blockers – prevent progression of aortic enlargement
5. Low impact aerobic sports
6. Endocarditis prophylaxis before surgery

Skeletal:

1. Braces/spinal fusion for severe scoliosis
2. Orthotics
3. ? Estrogen for young females – to speed up puberty à less deformity

*Severity of skeletal abnormality increases during puberty.

Ocular:

1. Appropriate aphakic/phakic glasses.

- Good visual acuity maintained by repeated refraction which also prevents amblyopia

2. Fundus examination – annually
3. Mydriatics / miotics for lens reposition
4. Lens removal is considered if:[9]

   a. Decrease visual acuity due to uncorrectable refraction

   b. Dislocation into anterior chamber

   c. Progressive posterior subluxation

5. Glaucoma treatment
6. Subtenon steroid injection for Brown syndrome

Surgical management

Indication

a. Decrease visual acuity due to uncorrectable refraction
   - Aphakic and phakic zone
   - Large lenticular astigmatism
   - Irregular refraction
   - Peripheral refraction and aberration

b. Dislocation into anterior chamber

c. Progressive posterior subluxation

Management Options

The degree of visual impairment depends upon the degree and symmetry of zonular weakness. Progressive zonular weakness allows the lens to become more spherical. If this process is concentric, the lens may remain centered, producing simple lenticular myopia More often, the lens subluxation is not con-centric, which induces a significant shift to-ward myopic astigmatism. The magnitude of such induced astigmatism will depend upon the power of the lens, degree of tilting within the visual axis, and the degree to which the lens is displaced across the visual axis. Lenses that are either very mildly or very severely subluxated respond well to optical correction. Mild subluxation allows correction of the patient's myopia or myopic astigmatism with a carefully performed spectacle prescription while the patient views through the phakic portion of the visual axis. In cases, where the lens subluxes out of the visual axis, refraction and optical correction of the aphakic portion of the pupil are effective, as long as the process is bilaterally symmetric. The patient with moderate to moderate to severe lens subluxation presents the greatest challenge. Large amounts of myopic astigmatism can be induced, and the lens edge may bisect the pupillary axis, interfering with any form of optical correction.

The importance of careful refraction through both the phakic and aphakic portions of the visual axis before concluding that optical correction is inadequate cannot be overstated.

However, if visual acuity does not improve sufficiently with optical correction, or the magnitude or asymmetry of required optical correction is not tolerated, other alternatives should be considered. Vitreous cutting devices, intracapsular lens extraction was the standard surgical procedure for lensectomy. This technique was associated with a high rate of significant morbidity, including vitreous loss and retinal detachment. In their review of 84 lensectomies in patients with either Marfan syndrome Jensen and Cross found that 51% of Marfan patients developed immediate surgical complications, most often vitreous loss. Several noninvasive techniques have been tried in an effort to avoid or postpone surgical lensectomy. These include chronic papillary dilation to either expose more of the crystal- line lens or to allow a sufficient aphakic portion of the pupil for refraction and correction, laser pupilloplasty, laser zonulysis and optical iridectomy. Although these interventions, may offer some visual improvement in selected individuals, for most patients, surgical lensectomy offers the most dramatic and long-lasting visual improvement in patients who cannot be optically rehabilitated while remaining phakic. With the advent of cutting and aspirating vitrectomy instrumentation, intracapsular lensectomy has been abandoned in favor of small-incision, endocapsular techniques. This revolutionized the surgical approach to ectopia lentis and

has dramatically shifted the risk-benefit ratio of surgical intervention. Most anterior segment surgeons are more comfortable with the limbal approach, though the pars plana route can be used. Because the pars plana is relatively underdeveloped in young eyes, the most prefer the limbal technique for its relative safety and ease of access.

Surgical Technique : Bimanual limbal Lensectory :

A peripheral corneal stab incision is made for an infusion cannula. A 23-gauge butterfly needle or self-retaining anterior chamber cannula is attached to an infusion bottle containing balanced salt solution and dilute epinephrine. A second anterior limbal incision is created with a MVR blade on the side opposite the direction of lens subluxation for insertion of the vitrectomy instrument. The MVR blade is advanced through the cornea to penetrate the peripheral anterior lens capsule, and a small 2 mm to 3 mm slit is created. The vitrectomy instrument (without an infusion sleeve) is then inserted into the anterior chamber, through the small capsulotomy into the substance of the lens. Aspiration is used to remove all lens material from within the intact lens capsule. Cutting mode is utilized intermittently as needed to remove all cortical material from the capsular bag. The vacuum levels required to aspirate the lens contents (200 mm Hg to 250 mm Hg) are higher than should be applied to vitreous. Therefore, it is crucial to maintain an intact capsular bag until all lens material is removed. Once this is accomplished, the vitrector aspiration levels should be turned down to levels appropriate for vitrectomy (100 mm Hg or less), and the cutting rate should be turned up to at least 400 cycles/minute and used constantly to perform a complete capsulectomy and anterior vitrectomy. If pupillary peaking is noted, the wound should be swept free of vitreous, and additional vitrectomy performed. This bimanual, small incision technique utilizing vitrectomy instrumentation reduces the risk of vitreous loss, secondary membrane formation, and retinal detachment. Surgical outcomes have been favorable in several reported series. Plager et al, reported 29 eyes of 15 patients undergoing lensectomy at a mean age of 5.8 years (range, 3 ears to 11 years). Visual acuity improved in all eyes, and 27 of 29 were 20/40 or better postoperatively. The other two patient's vision was limited by preexisting amblyopia; they were aged 10 years and 11 years at the time of lensectomy. No post-operative complications were noted with follow-up of up to 12 years in some eyes.

Visual Rehabilitation

Choice of optical rehabilitation of patients undergoing surgery for ectopia lentis is complicated by the lack of zonular support. Posterior chamber in-the-bag intraocular lens placement cannot be used, since the bag is subluxated and unstable. Most postoperative patients require aphakic correction with contact lenses or spectacles .These methods are usually well tolerated and provide excellent visual results. Alternatives are available for patients who demand them, although they should be advised of the additional risks involved. The early anterior chamber intraocular lenses provided hope of visual rehabilitation without contacts or aphakic glasses. Unfortunately, significant secondary complications, including chronic uveitis, glaucoma, iris erosion or distortion, and endothelial celll oss producing corneal edema have lead most surgeons to abandon these lenses, though re-cent design changes in ACIOLs are rekindling interest. Other investigators have attempted scleral fixation (suture) of posterior chamber intraocular lenses (PCIOLs) in the ciliary sulcus. Experience with this technique in children is extremely limited and only short-term follow-up data are available. Long-term concerns include suture erosion or breakage, endophthalmitis, lens decentration, glaucoma, retinal detachment, and mechanical erosion of the haptics into the ciliary body. Additionally, continued growth of younger eyes may result in unpredictable refractive outcomes. In eyes with only focal zonular weakness or dialysis, use of an endocapsular tension ring may permit placement of a PCIOL within the capsular bag. Introduced by Hara in 1991, the capsular tension ring is silicone or polymethyl methacrylate ring that helps maintain the circular contour of the capsular bag following cataract removal. As with sulcus fixated (sutured) IOLs, experience with this technique in children is limited. Until more is known about the long-term stability and potential complications of endocapsular rings, newer ACIOLs and sulcus fixated IOLs, the authors' preferred practice is postoperative correction with aphakic glasses or contact lenses. Combined with appropriate amblyopia therapy and good surgical technique, the prognosis for significant and safe visual rehabilitation of the child with ectopia lentis is excellent.

Posterior Segment Complication

Pars plana vitreolensectomy is a safe and effective treatment for subluxed lenses in patients with Marfan's syndrome. It appears that intraoperative prophylactic laser treatment need only be applied to areas of lattice degeneration to limit the incidence of post-operative retinal detachment.[11] Pars plana vitrectomy and primary scleral-fixated IOL implantation can be a safe procedure and gives good visual

rehabilitation in adult patients with Marfan's syndrome.[12]

Retinal detachment in Marfan syndrome is complete in 75% of the eyes. More than half (56%) the eyes had a retinal break only in the temporal half of the retina, and 83% had at least a break in the temporal half of the retina. In patients with retinal detachment, Currently available vitreoretinal surgical techniques result in successful reattachment of the retina in approximately 86% of the eyes. Studies shows that PPL + PPV + Scleral buckling is a safe and effective treatment for retinal detachment with Marfan syndrome.

Genetic counseling

Therapy of Marfan syndrome focuses on prevention of complications and genetic counseling. Marfan syndrome is autosomal dominant; therefore offspring of Marfan parents have a 50% risk of inheriting the disorder. Fathers of sporadic cases have been, on average, 7-10 year older than fathers in general population. These cases represent new dominant mutation. Prenatal diagnosis has been done by chorionic villus sampling and genetic linkage analysis. Fibrillin mutation screening is time consuming and expensive, but can offer accurate results where a mutation is known in the family. Linkage studies with intragenic polymorphic markers offer an alternative for some families. Both methods rely on suitable on family structure and co-operative relatives. Ultrasound diagnosis is unreliable. Recently matrix metalloproteinases (MMPs) have been studied and their role in lens subluxation have been proposed. Development of matrix metalloproteinase inhibitors may have a potential therapeutic value in the treatment of progressive subluxation of lens.[8]

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Ten-year results show high endothelial cell loss with anterior chamber fixation of the PC-IOLs.

Hara T, Hara T. *Arch Ophthalmol. 2004 Aug; 122(8): 1112-6.*
Hara Eye Hospital, Utsunomiya-shi, Tochigi, Japan

Authors report the outcomes in eyes in which a Sinskey-type conventional posterior chamber intraocular lens (PC-IOL) was fixed in the anterior chamber and followed up for an average of 10 years. Twenty-one eyes were included in the study. The IOLs were conventional hard PC-IOLs, 13.0 mm in overall length with 6.0-mm polymethylmethacrylate optic and polyvinylidene fluoride loops that tilted 10 degrees anteriorly. Results show at implantation the corneal endothelial cell density in 13 of 21 eyes was 382 to 1580 cells/mm (2) owing to the previous implantation of iris-clip or iridocapsular IOLs. The overall postoperative corneal endothelial cell loss was 30.9%. Six of 14 eyes with a preoperative corneal endothelial cell density less than 2000 cells/mm (2) developed bullous keratopathy. Although serious complications did not occur in 7 eyes with a cell density exceeding 2000 cells/mm (2), an average corneal endothelial cell loss of 26.5% still occurred. Except for 2 eyes, all loops were fixed at the scleral spur and a slight pupillary transformation occurred in only 1 eye. They conclude; Although this procedure is easy to perform and pupillary transformation does not occur, it is not recommended for aphakic eyes owing to the high corneal endothelial cell loss after an average 10-year follow-up.

Intacs receives FDA approval for keratoconus

Intacs (Addition Technology, Des Planes, Ill.) has received approval by the Food and Drug Administration for the treatment of keratoconus. The FDA adopted Brian Boxer Wachler, M.D.'s procedure guidelines for the approved surgical technique. Dr. Boxer Wachler and his research team published their technique and results last year in a study in Ophthalmology. It was the largest study to date on Intacs for keratoconus.

Intacs for keratoconus: can improve both uncorrected and best spectacle-corrected visual acuity and can reduce irregular astigmatism

Boxer Wachler BS, Christie JP, Chandra NS, Chou B, Korn T, Nepomuceno R. Ophthalmology. 2003 May;110(5):1031-40.
Boxer Wachler Vision Institute, Beverly Hills, CA 90210, USA.

Authors evaluated the efficacy and safety of placement of Intacs in subjects with keratoconus. Retrospective, nonrandomized comparative trial included 74 eyes of 50 subjects (41 male and 9 female). The mean age of subjects in the study was 35 years, ranging from 20 to 73 years. Twenty-six subjects underwent single-eye treatment, and 24 subjects had both eyes treated. A modified Intacs procedure was performed on subjects with keratoconus. Pachymetry was measured at the incision site, and the incision was made at 66% of the corneal thickness. A thicker ring segment was typically placed inferiorly, and a thinner segment was placed superiorly on the basis of a refractive nomogram. Differences between preoperative and postoperative uncorrected visual acuity, best spectacle-corrected acuity, and spherical equivalent. Changes in irregular astigmatism were evaluated with the inferior-superior value from comeotopographic maps, and differences in refractive cylinder groups were studied. Results showed Preoperative mean best-corrected logarithm of the minimum angle of resolution (LogMAR) visual acuity was 0.41 (20/50 - 1) (standard deviation [SD], +/-0.48), which improved to a postoperative mean of 0.24 (20/32 - 2) (SD, +/-0.31) (two lines of improvement). Preoperative mean uncorrected LogMAR visual acuity was 1.05 (20/200 - 2 1) (SD, +/-0.48), which improved to a mean of 0.61 (20/80-) (SD, +/-0.52) (four lines of improvement) at postoperative follow-up. Preoperative mean best-corrected LogMAR acuity in the corneal scarring group was 0.96 (20/200 + 2) (SD, +/-0.72), which improved to a mean of 0.54 (SD, +/-0.43) (20/63 - 2) (five lines of improvement). Uncorrected mean LogMAR acuity in the eyes with corneal scarring was 1.42 (20/400 - 4) (SD, +/-0.27), which improved to a mean of 1.03 (20/200 - 1) (SD, +/-73) (three lines of improvement). The mean spherical equivalent before surgery was -3.89 diopters (D) (SD, +/-5.16), which was reduced to a mean of -1.46 D (+/-4.11) at the postoperative follow-up. They concluded, Asymmetric Intacs implantation can improve both uncorrected and best spectacle-corrected visual acuity and can reduce irregular astigmatism in corneas with and without corneal scarring.

Dry eye diagnosis and management in 2004. 0.05% cyclosporine A (Restasis) shows promise

Perry HD, Donnenfeld ED. Curr Opin Ophthalmol. 2004 Aug;15(4):299-304.
Department of Ophthalmology, Weill-Cornell School of Medicine, and Research Laboratories, New York Eye and Ear Infirmary

This is a review article to document the changes in treatment paradigm for the management of dry eye. Restasis

is 0.05% cyclosporine A and is the first immunomodulatory agent approved for treatment of dry eye. RECENT FINDINGS: Mounting evidence supports the inflammatory mechanism as explanation for the occurrence of dry eye disease. Immunomodulation has been shown to be effective in-treating patients with moderate to severe dry eye disease caused by keratoconjunctivitis sicca. This addresses one of the two main forms of dry eye. There is a new report that immunomodulation using topical 0.05% cyclosporine A (Restasis) may also have a positive effect on meibomian gland dysfunction, the other main form of dry eye. In summary: Dry eye disease is defined as an abnormality of tear film resulting in changes in the ocular surface. These changes may be seen on ocular examination with the use of fluorescein and supravital staining techniques. Classification of dry eye disease shows two main types: aqueous deficiency and evaporative loss. There is hope that both of these types of dry eye will respond to immunomodulation therapy. Restasis shows promise as the first of these agents to be approved as therapy to treat moderate to severe dry eye disease.

Characteristics of Corneal Ectasia After LASIK for Myopia. 35% of reported cases require subsequent corneal transplantation

Twa MD, Nichols JJ, Joslin CE, Kollbaum PS, Edrington TB, Bullimore MA, Mitchell
GL, Cruickshanks KJ, Schanzlin DJ. Cornea. 2004 Jul;23(5): 447-457.

.There are numerous reports of corneal ectasia after laser in situ keratomileusis (LASIK) for myopia without a consistent definition of this condition or a definitive etiology. Authors conducted a retrospective analysis of published case reports to describe common characteristics of this postoperative event and compared them with findings from a group of successful LASIK patients. A medline search for "LASIK" and "ectasia" yielded 21 relevant articles published before May 2003 (n = 86 eyes, 59 patients). A comparison group (n = 103 eyes, 63 patients) was selected from a clinic-based sample of successful LASIK patients with 12 months of follow-up after treatment. Descriptive statistics are reported as median and interquartile range. Comparisons were performed using the Wilcoxon rank sum, Wilcoxon signed rank, and chi-square tests. Their results show,Time to diagnosis of ectasia after LASIK was 13 months (6 to 20 months). Residual myopia in the ectasia group was -3.69 D (-6.00 to -2.13 D) and was significantly greater than the comparison group, -0.38 D (-0.75 to 0.00 D), $P < 0.001$. After surgery, eyes with ectasia had increased corneal toricity 2.87 D (2.00 to 4.9 D) with increased oblique astigmatism 1.3 D (0.23 to 2.89 D) relative to eyes in the comparison group 0.00 D (0.00 to 0.08 D), and a loss of 2 lines (-0.5 to -6 lines) of best spectacle-corrected visual acuity (all $P < 0.001$). Thirty-five percent of reported cases resulted in subsequent corneal transplantation. They conclude preoperative characteristics of corneal ectasia include worse visual acuity, less corneal thickness, greater residual myopia, and greater corneal toricity than non-ectatic eyes. Treatment factors associated with corneal ectasia after LASIK are greater stromal ablation and less residual stromal bed thickness. Postoperative characteristics of corneal ectasia are myopic refractive error with increased astigmatism, worse spectacle-corrected visual acuity, increased corneal toricity with topographic abnormality, and progressive corneal thinning.

A 5-year, multicenter, open-label, safety study of adjunctive latanoprost therapy for glaucoma

Alm A, Schoenfelder J, McDermott J. Arch Ophthalmol. 2004 Jul;122(7):957-65.
Department of Neuroscience, Ophthalmology, University Hospital, Uppsala, Sweden

Objective of the study was to evaluate the 5-year safety and efficacy of adjunctive 0.005% latanoprost once daily. Patients with primary open-angle or exfoliation glaucoma who completed a 3-year, open-label, uncontrolled, prospective trial could enter a 2-year extension phase. High-resolution color photographs of irides were taken at baseline and at 14 subsequent visits. Photographs were assessed for change in iris pigmentation compared with baseline. Intraocular pressures and adverse events were recorded. Main outcome measure were development and progression of increased iris pigmentation over 5 years. Results: of the 519 original patients, 380 enrolled in the extension phase with approximately 89% having an eye color known to be susceptible to color change. After 5 years, most patients had no increase in iris pigmentation, but certain colored irides exhibited notably greater susceptibility than others. For those whose irides did change, onset occurred during the first 8 months in 74% and during the first 24 months in 94%. No patient developed an increase in pigmentation after month 36; the rate of progression decreased over time. Adverse event profiles were similar for patients with and without increased pigmentation. The overall mean intraocular pressure reduction from baseline of 25% was sustained with no need for change in intraocular pressure-lowering treatment in 70% of the eyes. Study concludes; Latanoprost therapy is safe and well tolerated for long-term treatment of open-angle glaucoma.

ORBITOTOMY

COMMON INDICATIONS

1 Year- Dermoid, Haemangioma, Retinoblasoma.

1-5 Years- Dermoid, Retinioblastoma, Rhabdomyosarcoma

5-10 Years- Pseudotumour, Dermoid, Optic nerve glioma, RMS, Lymphangioma, Lymphoma

10-30 Years- Peripheral Nerve Sheath tumour (schwanoma), Dysthyroid Ophthalmopathy, Pseudotumour

30-70 Years- Lacrimal gland tumours (Pleomorphic adenoma, adenoid cystic carcinoma), Cavernous haemangioma, Dysthyroid orbitopathy, Pseudotumour, Meningioma,

>70 Years- Melanoma, Metastatic orbital tumours, Basal Cell carcinoma, Mucocele.

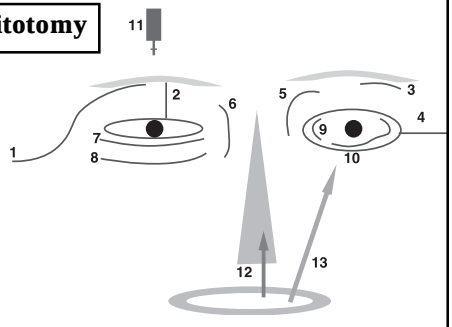
Surgical Approaches to Orbit

1. Stallord Wright incision
2. Byron Smith Lid splitting incision
3. Benedict's incision
4. Berkes- Kronlein Incision
5. Lynch incision
6. Gull wing incision
7. Subcilliary incision
8. Infraorbital incision
9. Transconjuctival incision for medial/ lateral orbitotomy
10. Forneal approach to inferior orbitotomy
11. Neurosurgical approach for superior/ posterior/ lesion at orbital apex
12. Transnasal Endoscopic approach for medial posterior lesions
13. Transantral approach for inferior lesion/ blow out fractures

For superior / lateral orbitotomy

For medical orbitotomy

For inferior orbitotomy



For transconjunctival orbitotomy

STEPS OF LATERAL ORBITOTOMY

1. General anesthesia
2. Stallard Wright Incision (Anterolateral approach)
3. Soft tissue dissection and periosteum incision parallel to the lateral orbital rim
4. Periosteum elevation and relaxation incision
5. Separation of temporalis muscle from the lateral orbital wall
6. 2 parallel osteotomies in the lateral orbital wall
   Superior just superior to the zygomaticotemporal suture
   Inferior just superior to the inferior orbital rim
7. Globe retracted by traction on lateral rectus muscle and periorbita incised above or below the LR
8. Bluent lissention to delinerte the mass
9. Removal of mass with cryoprobe slowly (by Rock & Roll movement) separating all adhesions
10. During entire procedure assess pupillary reactions meticulously.
11. After achieving good hemostasis reposition the bony flap & suture peuorteam loosly
12. Close skin with interrupted 6-0 Mersilk suture

COMPLICATIONS

Profuse bleeding

Ptosis

Diplopia

Ophthalmoplegia

Optic neuropathy

Vascular occulusion

CSF leak

Hypoesthesia

Incomplete removal
Recurrence

Vijay B Wagh, Anand Agrawal, Harish Pathak, M S Bajaj

Dr R P Centre for Ophthalmic Sciences, AIIMS, New Delhi

Where is my copy of DOS Times ?

Dear DOS members, anyone who could not receive
DOS Times from the month of July, 2004 onwards.

Please Contact:

President DOS : **Dr. GURBAX SINGH**
Email: dospresident@yahoo.com

or

Secretary DOS : **Dr. JEEWAN S. TITIYAL**
Email: dosonlin@vsnl.net

Attention DOS Members

The Hi-tech DOS Library is functioning on Ground Floor, Dr. R.P. Centre, Delhi Ophthalmic Sciences, AIIMS, New Delhi-110029 from 12.00 Noon to 9.00 P.M. on week days and 10.00 A.M. - 1.00 P.M. on Saturday, Sunday. The Library will remain closed on Gazetted Holidays. Members are Requested to utilise the Facilities Available i.e. Computer, Video Journals Viewing, Latest Books and Journals. We are planning to subscribe two journals member can give suggestion in this regard.

Dr. Lalit Verma
Library Officer, D.O.S.

DOS QUIZ NO. 13

1. What is the frequency of acoustic waves used in ophthalmology? .....
2. What is the normal thickness of optic nerve in imaging? .....
3. Who described first external dacryo cystorhinostomy? .....
4. Who is the Editor of Journal Survey of Ophthalmology? .....
5. Most Common location of juvenile retinoschisis is.....? .....
6. Most common organism causing post operative endophthalmitis ? .....
7. Classical visual field finding in hysteria is..... ? .....
8. Toutan giant cell is seen in .....? .....
9. Abraham lens has a focusing button of .....? .....
10. Angle between optical and visual axis is known as .....? .....

Rules:

- Please send your entries to the DOS office latest by 10th October, 2004.
- Prize Rs.500/- *Courtesy:* ***Syntho Pharmaceuticals***

ANSWERS OF DOS QUIZ NO. 11

1. Drug used in treatment of Essential Blephasospasm.	Botulinum Toxin
2. What is the probability of another break if one retinal break is present?	50%
3. What is the frequency used in Ultrasound biomicroscopy?	50 m Hz.
4. What is the thickness of posterior capsule of Human crystaline lens in centre?	4μ (microns)
5. Why negative cylinder is preferred in refraction / prescription?	to decrease the meridional astigmatism
6. Most common infective organism in neonatal conjunctivitis	chlamydia
7. Most common cause of internuclear ophthalmoplegia in young patients	Multiple Sclerosis
8. Most common ocular opportunist in patients with AIDS	CMV Retinopathy
9. Most common systemic association of Angiods streak	A Pseudo xanthoma Elasticum
10. Most important immediate management of Chemical burn to eye is	Copious Irrigation.

FORTHCOMING EVENTS

INTERNATIONAL

XXII Congress of the ESCRS
Temple House, Road
Blackrock, Co Dublin, Ireland
Date : 18-22 September, 2004
Venue : Paris, France
Contact: ESCRS
Tel : +353-1-209-1100 Fax : +353-1-209-1112
Email : escrs@agenda-comm.ie
Web : www.escrs.org

American Academy of Ophthalmology
23-26th October, 2004
New Orleans, LA, USA
American Academy of Ophthalmology
Tel : + 1-415-561-8500 Ext. 304
Fax : + 1-415-561-8583
Web : www.aao.org

20th Asia Pacific Academy of Ophthalmology Congress
27-31st March, 2005
Kuala Lumpur, Malaysia
The 20th Asia Pacific Academy of Ophthalmology Congress
Tel : +603-7956-3113 Fax : +603-7960-8297
Email : scretariat@apao2005.com.my
Web : www.apao2005.com.my

5th International Glaucoma Symposium
20th March, 2005 – 2nd April, 2005
Cape Tow, South Africa
Contact : Kenes International
Tel : +41-22-908-04-88 Fax : +41-22-7322850
Email : glaucoma@kenes.com
Website : www.kenes.com/glaucoma

ASCRS/ASOA Meeting Congress
16-20th April, 2005
Washington, DC
Contact : ASCRS
Tel : +1-703-591-2220 Fax : +1-703-591-0614
Web : www.ascrs.org

NATIONAL

9th Dr. R.K. Seth's Memorial Symposium on "Diabetic Retinopathy: An Overview"
Date : 2nd October, 2004
Venue : India Habitat Centre, Lodhi Road, New Delhi Contact : S. Zafar, Venu Eye Institute & Research Centre, 1/31, Sheikh Sarai Institutional Area,
Phase - II, New Delhi - 110017,
Ph : 29251951, 29251155, 29252417, 29250757
Fax : 011-29252370
Email : training.venu@spectranet.com, vcs@vsnl.comg

Uttaranchal Conference
2nd & 3rd October, 2004
1st Uttaranchal State Ophthalmic Society & Cold phaco/SICS live surgery worhshop
Registration oepn to all ophthalmogists
Organising secretary - Dr. Gaurav Luthra
Secretariat :
District & Dehradun Wave Lasik Centre
9-B Astley Hall, Dehradun-248001
Ph : 0135-3100350
Email : drluthra@drishti.org

DOS Midterm Conference
21st November, 2004
Contact : Dr. Jeewan S. Titiyal, Secretary DOS
R.No. 476, 4th Floor,
Dr. R.P. Centre for Ophthalmic Sciences
AIIMS, Ansari Nagar, New Delhi – 110029
Ph : 91-011-26589549, 265888852-65 Ext. 3146
Fax : 91-011-26588919
Email : dosonlin@vsnl.net
Website : www.dosonline.org

63rd All India Ophthalmological Society Conference
13-16th January, 2005
Contact : Dr. B. K. Tripathy, Organising Secretary,
Bimal Tripathy Lane, Mahatab Road,
Cuttack – 753001, Orissa
Ph : 0671-2310111, 2332483 Fax : 0671-2330111
E-mail : bimaltripathy@sify.com

Annual DOS Conference
2nd & 3rd April, 2005
Contact : Dr. Jeewan S. Titiyal, Secretary DOS
R.No. 476, 4th Floor,
Dr. R.P. Centre for Ophthalmic Sciences
AIIMS, Ansari Nagar, New Delhi – 110029
Ph : 91-011-26589549, 265888852-65 Ext. 3146
Fax : 91-011-26588919
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Prof. P.N.Nagpal launched the multi-specialty eye services on 1st August 2004.

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Refractive Surgery Clinic	**Dr. Sanjay Chaudhary**
Vitreo-Retina Clinic	**Dr. Ajay Aurora**
	Dr. Neeraj Sanduja
Phaco Clinic	**Dr. Sanjay Chaudhary**
Cornea Clinic	**Dr. Ajay Dave**
Squint Clinic	**Dr. Amit Gupta**
Oculoplasty Clinic	**Dr. Kiran Singh**

The refractive surgery clinic handles C-Lasik, Lasek and Phakic IOL. The vitreo-retina clinic is equipped with Topcon Digital Angiography, Iris Retinal Lasers and LIO, OTI B-Scan Ultrasound with 3-D facility and Vitreo-Retinal surgical services using the DORC Vitrectomy and Wild (Lieca) operating microscope. The cornea clinic handles Keratoplasty and cornea reconstruction. The squint clinic handles even complicated squints including vertical squints while the oculo-plasty clinic covers all plasty procedures.
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For details contact the director Dr. Sanjay Chaudhary on 9811070928 or the concerned consultant on the following numbers.

Ph: 23275893, 23278423, 23243717
Fax: 23281916
E-mail:dr.chaudhary@vsnl.com
www.spectacleremoval.com

UTTARA- EYECON 2004

Cold Phaco & SICS Live Surgical Workshop

2nd & 3rd October 2004, Dehradun

On behalf of the organizing committee we invite you to attend the First **Uttaranchal State Ophthalmic Conference,** the UTTARA-EYECON 2004 on Oct 3 and a pre-conference live surgery workshop on **Cold phaco & SICS** on Oct 2, 2004 at Dehradun.
A scientific extravaganza is planned to make the inaugural meet of the state a memorable one. Top national faculty has been invited to deliver lectures on the latest in ophthalmology.

Programme:

Saturday, October 2nd	1.30 pm to 7 pm -	: **Interactive Live Surgical Workshop, ONGC Hospital** – Phaco, Cold phaco & SICS
	8:30pm	: Banquet and entertainment programme
Sunday, October 3rd	**Conference venue -**	**Hotel Pacific** (5 star facilities)
	8.15 am	: Breakfast & Registration
	8.30 am to 1.30 pm	: Guest lectures, interactive sessions & panel discussions
	1.45pm	: Fellowship & Lunch
		Evening free for sightseeing

Guest Faculty

Dr. SS Badrinath, Chennai
Dr. S Bharti, New Delhi
Dr. Shobhit Chawla, Lucknow
Dr. Shobhit Chawla, Lucknow
Dr. Amod Gupta, Chandigarh
Dr. SPS Grewal, Chandigarh
Dr. Shashi Kapoor, Mumbai
Dr. DK Mehta, New Delhi
Dr. RN Mishra Allahabad
Dr. Sandeep Mithal, Meerut
Dr. PN Nagpal, Ahmedabad
Dr. Mahipal Sachdeva, New Delhi
Dr. Noshir Shroff, New Delhi
Dr. SP Singh, Allahabad
Dr. Dinesh Talwar, New Delhi
Dr. JS Titiyal, New Delhi
Dr. HK Tewari, New Delhi
Dr. Lalit Verma, New Delhi
Dr. Kapil Vohra, Ambala

We look forward to host you in the lush green surroundings of Dehradun- Mussoorie and invite you to register, by sending a draft for Rs 100 in favour of Uttara Eyecon 2004 payable at Dehradun to the secretariat.

Dr RK Pant
Chairman

Dr Gaurav Luthra
Organizing Secretary

Conference Secretariat :

Dr Gaurav Luthra, *Organizing secretary,* Drishti & Dehradun Wave Lasik Centre, 9 B Astley Hall, Dehradun-248001, Ph: 2656364, Mob: 0135-3100350, Email- drluthra@drishti.org

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Courtesy : Pharmtak Ophthalmic India Pvt Ltd, Mumbai

Delhi Ophthalmological Society Fellowship for Partial Financial Assistance to Attend Conferences

Conferences

International: two fellowships per year

- Maximum of Rs. 25,000 / -will be sanctioned

National: three fellowships per year (only for AIOS)

- Maximum of Rs. 5,000 will be sanctioned

Eligibility

- DOS Life Members (Delhi Members only)
- Accepted paper for presentation / poster / instruction course

Time since last DOS Fellowship:

Preference will be given to member who has not attended conference in last three years. However if no applicant is found suitable the fellowship money will be passed on to next year. Members who has availed DOS fellowship once will not be eligible for next fellowship for a minimum period of three years.

Authorship

The fellowship will be given only to presenting author. Presenting author has to obtain certificate from all other co-authors that they are not attending the said conference or not applying for grant for the same conference. (Preference will be given to author where other authors are not attending the same conference). If there is repeatability of same author group in that case preference will be given to new author or new group of authors. Preference will also be given to presenter who is attending the conference for the first time.

Quality of paper:

The applicant has to submit abstract along with full text to the DOS Fellowship Committee. The committee will review the paper for its scientific and academic content. The paper should be certified by head of the department / institution. In case of individual practitioner he or she should mention the place of study.

Credit to DOS:

The presenter will acknowledge DOS partial financial assistance in the abstract book / proceedings.

The author will present his or her paper in the immediate next DOS conference and it will be published in DJO.

Points awarded:

		Points
1)	Age of the Applicant	
	a) ≤ 35 years	10
	b) 36 to 45 years	07
	c) 45 years plus	05
2)	Type of Presentation	
	a) Instructor / Co-instructor of Course	10
	b) Free Paper (Oral)	08
	c) Poster	05
3)	Institutional Affiliation	
	a) Academic Institution	15
	b) Private Practitioner	20
4)	DCRS Rating in the immediate previous year	
	a) > 100	10
	b) 50-100	05
	c) < 50	not eligible

Documents

- Proof for age. Date of Birth Certificate
- Letter of acceptance of paper for presentation / poster / instruction course
- Details of announcement of the conference
- Details of conference(s) attended in previous three years.
- Copy of letter from other national or international agency committing to bear partial cost of conference if any.
- At least one original document should be provided, that is ticket, boarding pass or registration certificate along with attendance certificate of the conference.
- Fellowship Money will be reimbursed only after submission of all the required documents.

Dr. Gurbax Singh (President DOS), Dr. Noshir M. Shroff (Vice President DOS), Dr. Kamlesh (Editor) Dr. Lalit Verma (Library Officer), Dr. Sudipto Pakrasi (Member) Dr. J.C. Das and Dr. Jeewan S. Titiyal (Secretary DOS) will be the members of ***DOS Fellowship for Partial Financial Assistance to Attend Conferences Committee****.*

Application should be addressed to President, DOS. Application should reach secretary's office before **31st July** and **31st January** for international conference and before **30th September** for national conference. The committee will meet thrice in a year in the month of August, October and February with in 2 weeks of last date of receipt of applications. The committee will reply within four week of last date of submission in yes / no to the applicant. No fellowship will be given retrospectively, that means prior sanction of executive will be necessary.

Dr. Jeewan S. Titiyal
Delhi Ophthalmological Society, R.No. 476, 4th Floor,
Dr. R.P. Centre for Ophthalmic Sciences, AIIMS, Ansari Nagar,
New Delhi – 110029

DOS Credit Rating System (DCRS)

DOS has always been in the forefront of efforts to ensure that its members remain abreast with the latest developments in Ophthalmology. Among the important objectives formulated by the founders of our constitution was the cultivation and promotion of the Science of Ophthalmology in Delhi.

The rapid strides in skills and knowledge have created a need for an extremely intensive Continuing Medical Education programme.

In a bid to strengthen our efforts in this direction DOS had DOS Credit Rating System (DCRS), the details of which are given below. Our Primary objective is to promote value-based knowledge and skills in Ophthalmology for our members and give recognition and credit for efforts made by individual members to achieve standards of academic excellence in Ophthalmic Practice.

DOS CREDIT RATING SYSTEM (DCRS)

		DCRS	*Max.*
1)	Attending Monthly Clinical Meeting* † (For full attendence)	10	90
2)	Making Case Presentation at Monthly Meeting**	15	—
3)	Delivering a Clinical Talk at Monthly Meeting**	15	—
4)	Free Paper Presentation at Annual Conference (To Presenter)**	15	30
5)	Speaker/Instructor** in : Monthly Symposium	15	30
	: Mid Term Symposium	15	30
	: Annual Conference	15	30
6)	Registered Delegate at Mid Term DOS Conference	20	—
7)	Registered Delegate at Annual DOS Conference	30	—
8)	Full Article publication in Delhi Journal of Ophthalmology/DOS Times	30	60
9)	Letter to editor in DOS Times	10	20
10)	Letter to editor in DJO	15	30

If any of the presentations is given an Award – Additional 20 bonus Credits.

Member who have earned 100 Credits, are entitled to:

a) Certificate of Academic Excellence in Ophthalmic Practice.

b) Eligible for DOS Travel fellowship for attending conference.

If any member earns 200 Credits, he/she shall, in addition to above, be awarded Certificate of Distinguished Resource-Teacher of the Society.

Institutional assessment for best performance will be based on the total score of members who attend divided by number of members who attended. Institutional assessment regarding decision to retain the institute for the next year will be based on total score by all delegates who attend the meeting divided by average attendence of all 8 meetings.

Please note that the Institutions' grading increases if the attendance at its meeting is higher (i.e. more than the average attendence of the eight monthly meetings).

* Based on Signature in DCAC

** Subject to Submission of Full Text to Secretary, DOS

† Credits will be reduced in case attendence is only for part of the meeting.

DCRS !! Attention !!

* Members are requted to sign on monthly meeting attendance register and put their membership number.

* The DCRS paper will be issued only after the valid signature of the member in the attendance register.

* Please submit your DCRS papers to the designated DOS Staff only.

* The collected DCRS papers will be countersigned by President and Secretary and sealed immediately ofter the meeting is over.

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 _____ Fax No. _____

Proposed by

Dr. _____ Membership No. _____ Signature _____

Seconded by

Dr. _____ Membership No. _____ Signature _____

[Must submit a photocopy of the MBBS/MD/DO 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. 3100/- 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. 3100/- 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. Jeewan S. Titiyal, Secretary, Delhi Ophthalmological Society, R.No. 476, 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).

!!Attention!!
Case Presentation in the Monthly Meetings by Non Institutional Members

There will be one non Institutional case presentation/Clinical talk by one of the DOS member during the monthly meeting. The presentation will be done by a non Institutional member where monthly meetings are not being held. The presenter will be allowed to present a case or a clinical talk for same amount of time as it is given for other presentations in the monthly meeting. Interested members should contact secretary DOS at least two weeks before the monthly meeting with details of their presentation. If there are more than one request then they will be given opportunity in the next monthly meeting. The President and Secretary will review the presentation for its clinical and scientific contents. These non Institutional presentation will be graded for the best case presentation/Clincal talk as it is done for Institutional presentations and they will be eligible for best presentation award.