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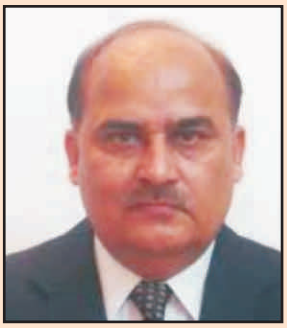
Full Thickness Macular Hole on OCT

Courtesy : Navendu Rai, Deoria

PRESIDENT'S MESSAGE

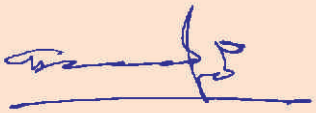


Dear Friends,

It gives me immense pleasure as I share with you another issue of UP Journal of Ophthalmology. The articles incorporated are written by author's of national and international repute and I am sure that you will enjoy reading them.

The annual conference of the society in going to be held at Lucknow and organizing team has left no stone unturned to make it a grand success. The secretary and chairman scientific committee with their team have put in all efforts to make a comprehensive program and I congratulate all of them for the fantastic work.

Looking forward to meeting you all.....



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Conferences: What Are We Looking For?

Dear Friends,

A flurry of Conferences and CMEs hover around our calendar with messages filling the inbox and with reminders for them. We all are aware and realize the mammoth efforts poured in to organize the program. Sometimes different programs are going on at different places at same dates, whereas, different halls are running simultaneously in the same conference. Galaxy of speakers, stalwarts in their fields are there to take the deliberations who come from far and wide places. But few questions which ponder my mind are:

- Do we require to attend them all?
- Are we optimizing these conferences and CMEs?
- What is the real motto when we are attending them?
- Are we still having the thirst within us?
- Is there felt need of organizing series of conferences one after other or overlapping on the same dates?
- Do we have enough delegates who actually are interested in the conference?

I really wonder how many of them we really attend and how many of them is actually required? Is our primary goal of learning fulfilled while we tend to attend series of these conferences? Or may be a few good conferences attended with full dedication can actually serve the purpose. I think our aim should be to attend those meetings in which we are able to satiate the lacunae of our knowledge and skill. And avoid meetings with similar theme and ideology.

The residents have golden opportunity to learn and enhance their knowledge and skills by attending them and can also find their mentor who can help them for achieving their future dreams. But they also need to customize which one to attend and which one to omit.

The practitioners need to update their knowledge and need to get a carry home message that they can incorporate in their busy practices. This is suitably covered in some of the deliberations. But sometimes they feel lost in the subject and feel they are unable to comprehend the important key points.

Fellowships and socialization are the integral part of any conference but should come at last. But sometimes halls are lying vacant and delegates are busy socializing despite best of lectures going on inside the halls.

Do we need to rethink?????? The goal or motto behind the conference seems to be lost.....

So much of sponsorship and investment done is for what ?

These meetings are golden opportunity to learn, to broaden our horizon, to update ourselves, to share our knowledge, to impart and learn our skills and so on and so forth. Lets pledge to regather the motto behind these programs and to utilize them in a more comprehensive manner.

We are serving you with another issue of journal with articles from all rostrums of ophthalmologists and hope that will be a brilliant platter to enjoy all flavors. I extend my heartfelt gratitude to all the authors who have penned the fantastic articles and am thankful to president, secretary, joint editor and whole editorial board for helping me in this task.

I am confident that the articles shall definitely enlighten all the readers who will enjoy reading the publications. We would like to invite constructive criticism to improve the quality and content.

Wishing you all the best!

Warm regards

Dr Shalini Mohan

MBBS (Gold Medalist), MS, DNB, MNAMS, FCGP
Editor, UP Journal of Ophthalmology
Associate Professor
Chief Glaucoma, Cornea Services & Eyebank
Department of Ophthalmology, GSVM Medical College, Kanpur (UP)
Ex Senior Resident Dr.R.P. Centre, AIIMS, New Delhi
Ex Consultant, Sir Ganga Ram Hospital, New Delhi.

Dear Members,

Greetings!!

We started the new term late last year with a lot of enthusiasm with the slogan "UPSOS for academics". This journal is playing a very vital role in this regard. I congratulate Dr Shalini Mohan and Dr Ram Yash Yadav for this.

Ophthalmology is advancing very rapidly with new technology knocking at our doors every day. Phacoemulsification is now a "refractive cataract surgery" With the advent of premium intraocular lenses. Our patients definitely deserve the best visual outcomes after cataract surgery.The journal is a step towards helping our members give to their patients the best, which they deserve. With advancing technology and techniques it is sometimes difficult to decide as to what should be the preferred practice patterns despite there being enough data on the internet to read. Panel discussion which is an important feature in this journal is the best way to help the readers decide what practices to follow as it brings our the differing views of multiple ophthalmologists on the same subject. This journal has very well incorporated this. And this needs to be the pattern of scientific programs in all our conferences too in the form of discussions and debates. This is the change that UPSOS intends to bring.

We are going to welcome you in Annual Conference of UPSOS at Lucknow.

So happy reading and happy contributing!!

Dr Mohita Sharma,

General Secretary, UPSOS

10 Life Lessons I Learnt-and Words Of Wisdom For Young Doctors

Dr. Quresh B. Maskati President, AIOS 2014-15
Mumbai

Born with a silver spoon in my mouth, being the son of Professor Dr. B.T.Maskati, (who later rose to be head of Dept. of Ophthalmology at KEM Hospital, Mumbai and President of AIOS 87-88), I did my schooling and my entire education in Mumbai, doing both my MBBS and MS from the GS Medical College and KEM Hospital. I also passed my DOMS (with a Gold Medal) and FCPS exams from the College of Physicians and Surgeons, Mumbai. After a year's stint as a lecturer in BYL Nair Hospital and Topiwala National Medical College, Mumbai, I went abroad to Rochester, NY and Boston for observerships in Cornea and Anterior Segment Microsurgery, training under legends such as Dr. G.N.Rao (in Rochester) and Dr. Claes Dohlman and Dr. Kenneth Kenyon (Mass Eye and Ear Infirmary, Boston), before starting solo private practice in 1986. I am currently Consultant and Chief, Maskati Eye Clinic, situated in South Mumbai. The views expressed are my personal ones.

1. Goal Setting
2. Consistency
3. Stand for Your convictions
4. Karma theory
5. Value yourself and others
6. Ask for advice
7. Be ethical
8. Collegiality
9. Empathise
10. Virtue of patience

1. GOAL SETTING: It is important to have long term vision and short term goals – achieve them and then set a new goal. In my first house-post, my short term goal was to excel in refraction using a plane mirror; after achieving that, I wanted to be able to see the retinal periphery with the indirect ophthalmoscope and so on, all the time retaining my long term vision of being a good ophthalmologist.

2. CONSISTENCY:You need not be the best person in the batch, or the smartest, or most charming or most popular, just be consistent in your behaviour and approach. Your smile and attitude to the last patient in a busy OPD should be exactly the same as it was for the first patient you examined. Do not give excuses, just strive for perfection. Work hard and practice till you get it right, whether it is retinoscopy or indirect ophthalmoscopy

3. STAND FOR YOUR CONVICTIONS: If you are carrying out a research project and the results are not what you expected, don't fudge the results. Publish what you truly find. An honest negative result, for e.g. failure of a new anti-glaucoma medicine to lower IOP, is more valuable for the ophthalmic community who reads the article than a false thumbs up given to the drug, just because a pharma company is sponsoring the study.

4. The KARMA THEORY: GIVE WITHOUT EXPECTING A REWARD: This is enshrined in our holy scriptures like the Bhagwad Gita as well. Help your colleagues unstintingly, teach your juniors with all your heart.. Ultimately you will get rewarded in far greater and unexpected ways.

5. VALUE YOURSELF AND OTHERS: Each of us in unique like a diamond. Even if bosses or seniors constantly berate you for being a "good for nothing", you must have a sense of self-worth or self -esteem that no one can destroy. For example, a 100 rupee note, no matter how crumpled, dirty or stamped upon it gets, will still retain its value when taken to a store to buy some goods. Similarly, when you become "senior", do not

destroy a colleague or junior's self- esteem – gently guide them to improve themselves.

6. ASK FOR ADVICE: No man is an island. You cannot be the best in everything. Do not hesitate in asking for advice, whether it is a second opinion, in the best interest of the patient or a senior or parent or spouse for non-ophthalmic decision making when in doubt. Also, be receptive to constructive criticism. It is the only way you will improve yourself.

7. BE ETHICAL: If something is unethical or dishonest and you do not wish to do it, don't do it..it does not matter if everyone else is doing it or that you will never get caught. Ultimately you have to live with yourself. As you grow older and have a family of your own, your kids will not have to look outside for a role model..they will have one in you!

8. PRACTICE COLLEGIALITY: Instead of asking a patient who has come to you due a post -operative complication, "Which butcher" has done this surgery, tell the patient, "let me see how I can help you". Share your knowledge and expertise with your colleagues. When you have a practice of your own, be willing to share your equipment and even your operation theatre with colleagues in the same city or town.

9. EMPATHISE WITH YOUR PATIENTS: Patients will forget what you said or did but will never forget how you made them feel.You must be able to communicate with your patient that you share their pain, their discomfort, their stress and you are doing all you can to alleviate their misery.

10. PRACTICE PATIENCE: You will ultimately have enough patients to keep you busy. Do not let anything frustrate you.. Be it an endophthalmitis post –op or lack of patients queuing up at your doorstep in spite of you being the best eye surgeon in the world

The Medical Profession is unique – it is definitely a noble profession. In spite of numerous attempts to vilify us in the media and the destruction of nursing homes, hospitals by enraged patients over perceived negligence, the public by and large still regard us as "noble". It is up to us, the medical fraternity to practice the highest ethical standards in spite of all hindrances. The joy that we get on restoring sight, as eye surgeons, makes every difficulty worthwhile. Remember, it is only the medical profession which willingly does charity using our skills and precious time to help those less fortunate on a regular basis.

The ten points I have mentioned above are all those that I have practised and still continue to practice myself. The reader is free to accept one or more or all of them - they have improved my life and earned me a restful sleep each night – the choice is yours!

Congratulations

1. Prof. Sandeep Saxena, *KGMU, Lucknow*

For being Conferred with the prestigious AN oration at Bihar Ophthalmological Society.

2. Dr. Sarad Bajpai

For being felicitated by Hon. Cabinet Minister Shri Narendra Singh Tomer ji, at Muraina MP, for exemplary community services

Panel Discussion on Management of CSME

UPSOS Correspondent : **Mohit Khattri**
Consultant, Regency Hospital Ltd, Kanpur

Expert Panel

Dr Lalit Verma(LV)
MD
Chairman Scientific Committee, AIOS
Director, Retina Services,
CFS, New Delhi

Dr Mahesh P. Shanmugam(MS)
DO, FRCSEd, Ph.D, FAICO
Head, Vitreo Retina Services
Sankara Eye Hospital, Bengaluru

Dr Manish Nagpal(MN)
MS, DO, FRCS
Consultant, Retina Foundation,
Ahmedabad

Dr (Prof.) Sandeep Saxena(SS)
MS, FRCSEd,FRCS(G),FRCOphth, FAICO,
FAMS, Facad TM
Professor of Ophthalmology
KGMC, Lucknow

Clinically Significant Macular Edema (CSME) is one of the commonest posterior segment pathology which we see in our practice. Continuous research and development of new diagnostic devices and drugs has refined the management of CSME and also increased the productivity of patients with Diabetic Retinopathy. With multiple options available, often we are confused in our choice. Our expert panel incorporating the stalwarts in field have put their views on this pertinent issue. I hope this discussion helps all of us in our day to day practice.

Q.1: For a clinically detectable CSME, you go for FFA, OCT or both?

LV: If I am seeing the patient of CSME for the 1st time – I will go for both FFA & OCT;

Although invasive, FFA is a dynamic procedure & it provides wealth of information in 5-7 mins on the circulatory status of retina , may pick up undetected / undiagnosed neovascularization , helps in picking up non-perfusion areas, tells us about macular ischemia ; Also very useful to pick up focal leaks for laser photocoagulation.

OCT helps the clinician with qualitative as well as quantitative information about the anatomical structure of retina, what is happening at Vitreo-retinal interface; recent models of SS- OCT also helps to study choroidal vasculature.

OCT-A (OCT Angiography) provides information, similar to FFA, without any Fluorescein Injection. Along with OCT, it is becoming an increasingly popular tool in evaluation and follow up.

MN: Only OCT unless there is unexplained loss of vision and I want to look at FAZ

MS: Only OCT unless vision loss is profound and not explained by edema alone – to rule out macular ischemia. If OCTA is available, no FFA even in this situation.

SS: For diabetic macular edema (DME), in the current scenario, SD-OCT evaluation confirms the diagnosis. It also provides macular thickness parameters as well as cross sectional analysis providing status of disorganization of retinal inner layers (DRIL) as well as the ellipsoid zone (EZ). All these parameters have a prognosticating value. OCT angiography through its enface and flow study provides a non invasive evaluation of macula in DME to rule out macular ischemia.

Q.2: How do you decide for Anti VEGF Vs Steroids?

LV: Factors to be considered include : phakic / pseudophakic / about to become pseudophakic ; Associated Glaucoma / Raised IOP ; can patient come for follow up every 4 weeks

; affordability ; Any Cardiovascular event / Neurological disease in recent past ; Pregnancy ; Generally 1st line of treatment for centre-involving DME in phakics with compromised BCVA (< 6/9) is multiple Anti-VEGF Injections. Same is true for patients with Associated Glaucoma / Raised IOP ; IntravitrealOzudrex may be preferable in Pseudophakics / about to become pseudophakic, recent CVA (< 2-3 months), Pregnancy & patient is from far flung area & unable to come for frequent follow ups.

MN: My first line would be anti my first line would be anti VEGF as it takes care of oedema as well as helps overall regression of PDR. Would use steroids if we need frequent injections to treat the condition. Also if the presenting oedema is quite significant and there are lot of lipid deposits in macula, I may prefer initial steroids.

MS: Anti VEGF's are the primary choice unless there is history of cardiovascular or neurological vascular event in the past 3 months.

Primary steroid may be considered if there are hyper reflective dots in the retinal layers in SS-OCT, pseudophakia, other eye having shown better results with steroid. Relative indications for primary steroid are subretinal hard exudate and neurosensory detachment.

Pre-existing glaucoma is a relative contraindication for steroid.

SS: Vascular endothelial growth factor (VEGF) and inflammation have been implicated in the pathogenesis of DME. SD-OCT should rule out any tractional component on the macula. Anti-VEGF therapy is the current therapy of choice. In case the patient is not responding after three one-monthly doses of intravitreal Anti-VEGFs, the anti-VEGF molecule may be changed. Intravitreal triamcinolone or dexamethasone implant may be added in unresponsive patients.

Q.3: What's the first choice of Anti VEGF for you in CSME? Ranibizumab Vs Bevacizumab Vs Aflibercept?

LV: As per available evidence + experience, all the available Anti-VEGF agents work equally well.

This has been substantiated by the recently published report of Protocol T. Taking into account Safety & Cost issues, Ranibizumab is my first choice ; Plus it has the largest number of prospective randomised controlled trials and published data – which increase your confidence in treating a patient.

Bevacizumab (Avastin) also works pretty well, but there are issues of non-availability of single use vials; People use various ways to economise the treatment: multiple prick of same vial , prepare multiple injections under laminar flow , pooling patients on a single day etc. But all these are fraught with complications & cases of cluster endophthalmitis have been reported from all across the world, including India.

Aflibercept (Eylea) also works pretty well but hasn`t become 1st line in India because of cost issues.

MN: Ranibizumab

MS: Preferably ranibizumab unless vision is less than 6/12, aflibercept may be considered. However, affordability plays a major role in selection of the agent, ulimtatelybevacizumab being the most commonly used.

SS: Anti-VEGF therapy, in our country, depends on the financial status of the patient. Each patient requires at least 3 loading doses in each eye at monthly interval followed by as per requirement therapy. Hence, Bevacizumab remains the first choice, followed by Ranibizumab. Ranimizumab biosimilar is also effective. Aflibercept has also now been approved by USFDA.

Q.4: After what time interval would you like to repeat your Anti VEGF?

LV: In centre-involving DME with compromised BCVA, generally end up giving 3 Injections of Ranibizumab at 4 weeks interval between injections. If OCT has improved & become stable after 3 injections, interval between injections may be increased – specially if the metabolic parameters are also controlled & stable.

MN: One month

MS: Monthly injections until total regression of edema, monthly follow-up for the next few months to detect interval to recurrence of edema in an individual patient and re-treat. The new follow-up schedule depends on the time to re-treat, increasing the interval to follow-up and treat in due course of time.

SS: As per standard norms, one monthly three loading doses are required followed by alternate month therapy or as per requirement. This depends on the improvement in visual acuity and macular thickness parameters on SD-OCT. Careful evaluation of EZ is also required. Patient's blood and kidney parameters have to be kept in check for an effective outcome. Usually, upto 7 injections may be required in the first year of treatment. Subsequently, the number of injections decrease, if the patient is kept purely on Anti-VEGF therapy.

Q.5: Under what scenario would you like to change your drug in the next injection?

LV: I prefer to change the class of drug (rather than change to

another drug in the same class) & shift to Ozudrex if there is inadequate response to 3 monthly injections of Ranibizumab. The criteria of inadequate response has varied; I consider < 1 line improvement &/or < 100 u decrease in OCT thickness as inadequate response.

MN: Only if it does not respond on the one month follow up.....shall not wait for three injections to do that.

MS: If there is persistence / inadequate response after 3 injections, I would change to another agent. There is however current evidence to state that continuing the same treatment is not inferior to switcing to another agent (data not available for bevacizumab).

SS: If the patient is not responding after three doses at monthly intravitreal injections, medication may be switched. In unresponsive patients intravitreal steroids may help.

Q.6: After how many days of injection do you laser if needed?

LV: If the leaks on FFA are > 750-1000 u away from centre of fovea, I consider doing focal Argon Laser after 2 weeks of Intravitreal Injection. There are lot of patients of DME, where after few intravitreal injections, do focal argon laser – this helps to decrease the number of injections and may make the treatment finite.

MN: If I have decided to laser a circinate for focal oedema then I would do it at the same sitting. If it's a grid laser I would wait for a month post injection for the oedema to flatten.

MS: Grid laser is not something I do anymore but focal laser to microaneurysms after regression of edema. However literature does not seem to support routine use of laser except in resistant cases.

SS: SD-OCT is helpful in evaluating the improvement in macular thickness after injection(s). Barely visible or subthreshold laser may be performed once central subfield thickness is achieved in the range of around 300 microns.

Q.7: Do you do paracentesis while giving intravitreal injections?

LV: Generally Not; Do consider paracentesis in patients with Glaucoma / compromised disc vasculature (Pale disc)

MN: No

MS: Only when the volume of injection is 0.1ml and / or if the patient has glaucoma.

SS: Paracentesis has been advocated and practised too after intravitreal injection. I do not go for paracentesis after injection.

Q.8: Do you think biosimilars score at par?

LV: Biosimilars are a great boon for developing country like ours. Efficacy wise, there are at par.

MN: I haven't used them yet.

MS: Can't answer this question as I have not used biosimilars.

SS: Biosimilar has been been found to be effective, but drug molecule stability often differs from batch to batch making it unpredictable sometimes.

Q.9: Do you advocate giving anti VEGF with phacoemulsification in cases of cataract with CSME?

LV: If the degree of Cataract is not significant & patient has CSME with centre involving DME, would like to give multiple Intravitreal Anti-VEGF Injections. However, if there is a significant cataract in a patient with centre involving DME & there is a need for early visual rehabilitation, I do give Intravitreal Injection at the conclusion of Phacoemulsification. In such situations, Ozudrex may be preferable to Anti-VEGF.

MN: yes, we routinely give that.

MS: Yes.

SS: Anti-VEGF therapy may be given after an uneventful phacoemulsification surgery. I plan surgery and intravitreal in two sittings at our tertiary care center.

Q.10:What's the place for posterior subtenon injections in your practice?

LV: In the management of centre involving DME, Intravitreal Injections work better than posterorsubtenon injections. Can consider PST if After Cataract surgery in diabetic patient with DME there is worsenenig of macular edema with fall in BCVA.

MN: For diabetic csme we rarely give sub tenon.

MS: Not much in the treatment of DME.

SS: Posterior subtenon injections do hold good at times.

Oxygen therapy in Preterm: Savior or Threat ?

Rizvi SA, MBBS; **Abdul Waris,** MS; **Naheed,** MS
Institute of Ophthalmology, JNMCH, AMU, Aligarh

Retinopathy of prematurity (ROP) refers to the developmental disorder of the retina in premature infants and is one of the most serious vision threatening disease among premature infants.Earlier ROP was thought to be associated with oxygen therapy. Later it was also reported in cases without oxygen therapy. Therewere some premature infants who received oxygen therapy but didn't develop ROP. Finally, it was concluded that etiology of ROP is multifactorial occurring most frequently in the small and sick infants, but following three factors were found to be significantly associated with ROP: low gestational age (LGA), low birth weight (LBW) and prolong supplementary oxygen therapy after delivery.

Retinal vascularization starts at optic nerve head at 16 weeks of gestation then progresses to the periphery. Vascularization is almost completed by term.Inside the uterus, the fetus is in a hypoxic state in contrast to after birth. In premature infants, the growth of retinal vessels is stimulated by vascular endothelial growth factor (VEGF). The pathogenesis of ROP includes 2 phases. In the first phase, the immature retina is usually exposed to hyperoxia, which inhibits vascular endothelial growth factor (VEGF) and thus vessels stop growing. The second phase, precipitated by the increasing metabolic demand of the developing retina with a compromised vascular supply which is characterized by relative hypoxia, this stimulates VEGF and uncontrolled neovascularization occurs that extends into the vitreous and further causes sequelae of disease. Both duration and saturation of oxygen is very crucial in prevention of ROP.

The optimal oxygen saturation targets for preterm newborns are still controversial. In many studies oxygen is established as an important risk factor causing ROP. Oxygen is a drug and it should be administered in a quantity that is absolutely necessary. If a preterm neonate born at < 32 weeks gestation needs resuscitation at birth, inhaled oxygen concentration (FiO2) should be titrated to prevent hyperoxia and achieve gradual increase in oxygen saturation. Oxygen level in blood should be continuously monitored using pulse oximeter. It has been observed that if oxygen saturation in a baby on oxygen therapy is kept between 85% and 93%, in about 90% samples partial pressure of oxygen is in desirable range (40 to 80 mm Hg) and helps in preventing occurrence and progression of ROP.Due to inadequate antioxidant defense system, premature infants are not evolved to live in an oxygen-rich ectopic environment. During recovery phase of respiratory illness in preterm neonates, targeting higher oxygen saturations results in exposure of various organs to free radicals, which can lead to the progression of many pathology such as ROP, necrotizing enterocolitis, bronchopulmonary dysplasia, and periventricular leukomalacia.

Two landmark studies- Surfactant, Positive Airway Pressure, Pulse Oximetry Randomized Trial (SUPPORT) and Benefits of Oxygen Saturation Targeting Study II (BOOST-II) compared 85-89% SaO2 vs. 91-95% SaO2 and found that lower oxygen levels were associated with increased mortality, but lower rates of ROP.

Recently certain studies have reported that earlylow oxygen saturation (70%–96%) in the first few postnatal weeks (till 32 weeks PMA) and late high oxygen saturation (94%–99%) (after32 weeks PMA) decreasesthe risk of progression to severe ROP. The beneficial effect of early low and late high oxygen can be explained by the 2 sequential phases of ROP pathogenesis. During first phase, ROP is triggered by hyperoxia between birth and 30 to 32 weeks' gestational age. Early low oxygensupplementationis used to avoid this hyperoxia.The second proliferative phase begins around 32 to 34 weeks' gestational age and is associated with an increased VEGF expression in the retina in response to relative hypoxia, which results in pathologic neovascularization. Supplemental oxygen can be used therapeutically to downregulate VEGF expression and to limit the neovascular complications of ROP. It was concluded thatif oxygen saturations were controlled in both phases of ROP, it may reduce the occurrence and severity of ROP. But large randomized clinical trials along with long-term developmental follow-up are warranted to confirm these findings.

It isalso found that variability in oxygen saturation contributes to the severity and high incidence of ROP. So it is advised to reduce the variation of oxygen saturation with the help of proper monitoring and good neonatal care. We should also try to limit the duration of supplemental oxygen whenever possible, as duration of oxygen supplementation is also a very important factor leading to ROP.

Use of oxygen in preterm infants is a two edge sword. It's a struggle to save the life of baby at cost of risking his vision. Optimal oxygen saturations level for such babies is still not been established. Larger randomized control trials and much more research work are needed in this field to solve this dilemma.

Focus On Vitamin D In Diabetic Retinopathy

Gauhar Nadri, MBBS. **Sandeep Saxena,** MS, FRCSEd, FRCS, FRCOphth, FAICO, FAMS, FAcadTM
Department of Ophthalmology, King George's Medical University, Lucknow, U.P-226003 India
Professor and Chief of Retina Service , Department of Ophthalmology, King George's Medical University, Lucknow. U.P-226003 India

Abstract:

The relationship between vitamin D and health has received increasing attention from the scientific and medical communities, in recent years. Vitamin D deficiencies have repetitively been associated with numerous acute and chronic diseases, including diabetic retinopathy. Its active metabolite, 1,25-dihydoxy vitamin D, acts as a modulator of cell proliferation, differentiation and apoptosis. Cumulative data from observational studies and various meta-analyses suggest that low serum vitamin D levels are associated with increasing severity diabetic retinopathy. Therefore, we made a descriptive review of the mechanisms linking a potential role of vitamin D with the current concepts of diabetic retinopathy pathophysiology.

Introduction

Diabetes mellitus continues to be a tremendous health burden in world. Diabetes mellitus (DM) is a large public health problem which affects more than 300 million individuals worldwide.[1] Diabetic retinopathy (DR) is among the most common diabetic complications, and is the leading cause of blindness among working-aged individuals all over the world.[2] The prevalence of DR varies from 20% to 80% in different studies. Recent estimates suggest that the number of people with diabetic retinopathy will increase to 191 million by 2030.[3]

Vitamin D is essential for a large number of physiologic processes. Vitamin D insufficiency has reached pandemic proportions, with more than half the world's population at risk.[4] Vitamin D insufficiency has been implicated in the pathophysiology of diabetes and also correlated with an elevated risk of cardiovascular disease, cancer, and mortality.[5, 6] Furthermore, vitamin D insufficiency has been associated with neurologic conditions, such as multiple sclerosis and Parkinson's disease.

Vitamin D Function and Health

Synthesis and its Actions

Vitamin D (ergocalciferol and/or cholecalciferol) is produced and excreted by basal skin keratinocytes exposed to ultraviolet radiation (UV-B), or directly provided by food. While skin vitamin D is transported into the liver bound to binding proteins (DBP), dietary vitamin D is absorbed by the gastro-intestinal tract and transported to the liver via the venous circulation and chylomicron remnants. Part of the vitamin D produced is stored in fat cells and may serve as an endogenous source of vitamin D. In the liver, vitamin D2 and vitamin D3 are hydroxylated in position 25 by several enzymes found in microsomal or mitochondrial fractions. Once produced in the liver, 25(OH)D is released into the bloodstream whilst bound to DBP. Alternatively, vitamin D can be metabolized in 25(OH)D in other tissues. In the kidney, 25(OH)D is converted to the active metabolite, 1,25(OH)2D, through the action of the enzyme 1-alpha-hydroxylase (CYP27B1), located in the proximal tubules. In excess, 1,25(OH)2D and 25(OH)D activate 24-hydroxylase (CYP24A1) and are degraded into 24-hydroxylated products, i.e., 24,25(OH)2D and 1,24,25(OH)3D, which have no biological activity. Once produced in the kidney, 1,25(OH)2D is released and transported into the bloodstream and is mainly bound to DBP until it reaches target tissues expressing vitamin D.

Modes of Action

Similar to other steroid hormones, vitamin D functions according to two modes of action: genomic action; a mechanism mediating gene transcription and non-genomic action; a rapid non-transcriptional action, mediated by the activation of secondary messengers and phosphokinase. [7, 8] The genomic pathway is mediated by the binding of 1,25(OH)2D with a high affinity vitamin D receptor (VDR). When activated, the VDR acts as a transcriptional factor and may directly or indirectly control 200 to 2000 genes in various tissues and cells.[9] This includes genes involved in mineral and bone homeostasis, but also genes controlling cell proliferation, differentiation, and apoptosis.[10] The VDR is ubiquitously expressed throughout the human body[11], including in immune cells, endothelial cells and vascular smooth muscle cells[12], but also in eye tissues, including the retina.

Role of Vitamin D in Diabetic Retinopathy

Animal studies have suggested that supplementation of

calcitriol [1,25(OH)2D], the hormonally active metabolite of vitamin D, is protective against retinal neovascularization and multiple other studies have revealed the anti-angiogenic effects of vitamin D.[13] Vitamin D deficiency (VDD),defined as a serum vitamin D concentration of 20 ng/mL, has also been associated with impairment of insulin secretion, metabolic syndrome, and systemic diabetic progression.[14-15] Since vitamin D metabolism is dependent on sunlight also, VDD follows a seasonal cycle, with vitamin D levels lower in the winter than in the summer.[14]

Payne et al assessed the relationship between vitamin D status and diabetic retinopathy and showed that the subjects with type 2 diabetes mellitus, especially those with PDR, had lower vitamin D levels. The use of multivitamins was also somewhat protective against vitamin D insufficiency. [16]

Long et al evaluated the relationship between vitamin D deficiency and retinopathy severity in diabetic patients with poorly or well controlled glycaemia , and suggested that vitamin D deficiency is associated with severe diabetic retinopathy in patients with well controlled diabetes. Risk factors found to be positively associated with increased severity of diabetic retinopathy were male, increased duration of diabetes and increased HbA1c levels. Correlation of vitamin D with diabetic retinopathy has been evaluated in a number of studies.[17]

Askoy et al. (2000) found that lower concentration of active vitamin D (1,25-dihyroxyvitamin D3) levels were associated with increased retinopathy.[18] In the same way, Gunger et al. (2015) compared 50 patients each of two groups: one with early-stage diabetic retinopathy with vitamin D deficiency and other with early stage diabetic retinopathy without vitamin D deficiency.[19] They found lower serum concentration of vitamin D was associated with early retinal nerve fiber layer thinning.[19] Also a study with sample size of 18 363 patients from NHANES (2008–2012) found vitamin D was associated with diabetic retinopathy.[20] Similarly, a study in a Chinese population of patients with type 2 diabetes used logistic regression analysis and found that vitamin D deficiency was an independent risk factor for diabetic retinopathy and that lower vitamin D levels were associated with increasing severity of diabetic retinopathy.[21] Likewise another study carried out in Japanese population of patients with type 1 diabetes also found that vitamin D deficiency is related to diabetic retinopathy.[22]

Vitamin D has been implicated in the pathogenesis of diabetic retinopathy through its effects on the immune system. Vitamin D has anti-inflammatory and anti-angiogenic role in diabetic retinopathy. Inflammatory cytokines, such as TNF-α, TNF-β, IL-6, and plasminogen activator inhibitor-1 are upregulated in patients with type 2 diabetes, and it has been shown that vitamin D decreases the production of several pro-inflammatory cytokines, such as IL-2, IL-6, IL-8, IL-12, and TNF-α.11 Vitamin D also exerts an anti-inflammatory effect by decreasing the proliferation of helper T-cells, cytotoxic T-cells and natural killer cells.[23]

Vitamin D may also contribute to diabetic retinopathy via angiogenesis mechanisms. Albert et al. have showed that the active metabolite of vitamin D, calcitriol, is a potent inhibitor of retinal neovascularization in vivo and also inhibits retinal endothelial cell capillary morphogenesis in vitro.[19] Additionally, calcitriol downregulates hypoxia-inducible factor-1 (HIF-1) transcriptional activity, as well as HIF-1 target genes, such as vascular endothelial growth factor (VEGF).[24] As several of the complications in diabetic retinopathy, such as macular edema and neovascularization, are driven by VEGF production[25, 26, 27] vitamin D could exert its positive effect via calcitriol mediated VEGF reduction.

Meta-analyses

Recent meta-analysis demonstrated the results of 15 observational studies and provided powerful evidence that serum 25(OH)D levels were related with an increased risk of DR in type 2 diabetes patients. This meta-analysis concluded that low 25(OH)D levels were associated with an elevated risk of DR.[28]

Another meta-analysis demonstrated a significant association between VDD and DR and a statistically significant difference in mean serum vitamin D levels between DR and non-DR patients.[29]

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Complete Resolution of Subretinal Fluid Unnecessary for Good Outcomes In Wet AMD

This phase 4 trial assessed the visual outcomes associated with subretinal fluid resolution in patients with active subfoveal choroidal neovascularization. Participants received monthly ranibizumab injections until complete intra- and subretinal fluid resolution (intensive arm) or until intraretinal fluid resolution with some remaining foveal subretinal fluid (<200 µm; relaxed arm). After 24 months, the groups showed similar BCVA improvements. The relaxed group required fewer injections and maintained more patients on 12-week dosing intervals. Visual outcomes are not significantly affected by lingering subretinal fluid, the study concludes. *Ophthalmology, May 2019*

Role of Low Vision Devices in Childhood Blindness

Haque OI, MS, **Waris A,** MS, FICO (UK), FICS (USA), FRCS (Glasg), FRCS (Edin)
Institute of Ophthalmology, JNMCH, AMU, Aligarh

Low vision optical devices include a variety of gadgets, for example, stand and hand-held magnifiers, strong magnifying reading glasses, loupes, and small telescopes. Since these devices can significantly increase magnification power and prescription strengths, alongside higher-quality optics, they are different from regular spectacles and commercially available magnifiers. Low-vision devices are designed to improve visual execution in children with low vision, in this way empowering scholarly and social adjustment and giving advancement of day by day encounters. They can be optical or optical and electronic.

Optical Aids for Distance and Intermediate Distance

The telescopic system (TS) or telescope is an optical instrument that improves the resolution of an object by increasing the size of the image projected on the retina, making it closer. It is available for far, near, and middle distances

A telescope enables greater participation in daily and social activities such as watching television and reading whiteboards, street signs, house numbers, billboards, et cetera. However, its disadvantages are restriction of visual field and illumination, difficulty in locating and focusing on objects quickly, and limited focus depth, cost, difficulty in using the devices, and aesthetic considerations limit its use.

Galilean Telescope

The Galilean telescope is a simple system consisting of 2 lenses, an objective lens which is a convex (plus) lens, close to the object and an ocular lens which is a minus lens, positioned near the eyes.

The difference in their focal lengths determines the distance between the two lenses. The image produced is real and erect. It is lighter, shorter, and cheaper than the Keplerian type, thus the first-choice prescription for children. It is also the first choice in cases of peripheral field loss; in these cases, the lens order is designed in reverse (plus lens closer to the eye), providing a wider visual field.

Keplerian Telescope

Also known as astronomical or prismatic telescope, the Keplerian telescope is an optical systemthatuses two convex (plus) lenses, the objective lens of lesser dioptric power than the ocular. The distance between the two lenses is the sum of their focal lengths. The image formed is real and inverted and needs a prism to reverse the image, thus making it longer and more cumbersome. It produces greater visual field and better optical quality than Galilean telescope.

Hand-Held, Spectacle-Mounted, or Clip-On Telescope

A hand-held telescope is simple to use, lighter, and cheaper than the Galilean and Keplerian telescopes. It is particularly indicated for short activities and could be the first prescription choice for children.

A spectacle-mounted telescope has the advantage of leaving the hands free. It is helpful for prolonged activities. However, they both weigh and cost more.

The clip-on model has the advantages of both: It is lighter than the spectacle-mounted model. However, it can scratch the lenses and reduce the visual field to further distances.

Monocular or Binocular

A monocular telescope is better suited when there is a significant difference in visual acuity (VA) between the two eyes. It is more discreet, lighter, and cheaper. It may be used in the dominant or better-seeing eye. The binocular telescope is suitable when there is similar visual acuity in both eyes, to increase the visual field, and for nystagmus. The binocular style both weighs and costs more than monocular

Fixed-Focus, Focusable, or Autofocus Telescope

A fixed-focus telescope is suitable for children with poor motor coordination. Nowadays it is rarely prescribed; a focusable telescope reaches far, near, and intermediate distance and is preferred for and by children. The autofocus telescope both weighs and costs more, and it does not constitute the first choice prescription for children.

Optical Aids for Near Tasks

Children often do not complain about their difficulty with near work. With adequate accommodation by getting closer for the small print, they can read without a problem. However, as

school activities get more sophisticated and the fonts of reading material get smaller, more magnification is required, and objects are brought too close, making reading more fatiguing. When and if this becomes an issue, near aids can be beneficial.

Near low-vision aids:

- High-plus spectacles (microscopes)
- Hand-held magnifier
- Stand magnifier
- Telescope system for near (telemicroscope)

High-Plus Spectacles (Microscopes)

High-plus spectacles are convex (plus) lenses mounted in a spectacle frame. They provide maximum magnification when objects are positioned at or near the focal distance of the lens, producing parallel rays and the image forming at optical infinity

Its advantages are that its hands-free, requires no additional training, greater visual field, comfortable for prolonged reading, and can be used alongside other aids

Disadvantages include Fixed optical center makes adaptation on peripheral vision difficult, reduces the visual field in high-power lenses and obstructs light at closer distances and are often not well-accepted in children with sufficient accommodation; however, it is a good option for patients with aphakia or pseudophakia.

Hand-Held Magnifier

Hand-held magnifiers are either convex (plus), convex sphere, or aspheric lenses with a handle that allows them to be held in various positions. They increase the size of a retinal image and bring the image into focus, producing a virtual and erect image located in a distance greater than the focal length of the lens. Hand-held magnifiers provide maximum magnification when an object is standing at or close to its focal distance, producing parallel rays and the image forming at infinity optically

Nonoptical

Non-optical aids are visual aids that do not use magnifying lenses to improve visual function. They can improve the other visual aid's function or even replace optical aids. They enhance visual function by

- Linear magnification
- Lighting control
- Enhanced contrast
- Reduction of glare

Benefits of low-vision aids

The prescription of low-vision devices gives the child

- Self-dependence
- Better adaptation to the daily activities materials
- Exposure to enriching experiences
- It constitutes an important factor for socioeconomic and cultural integration

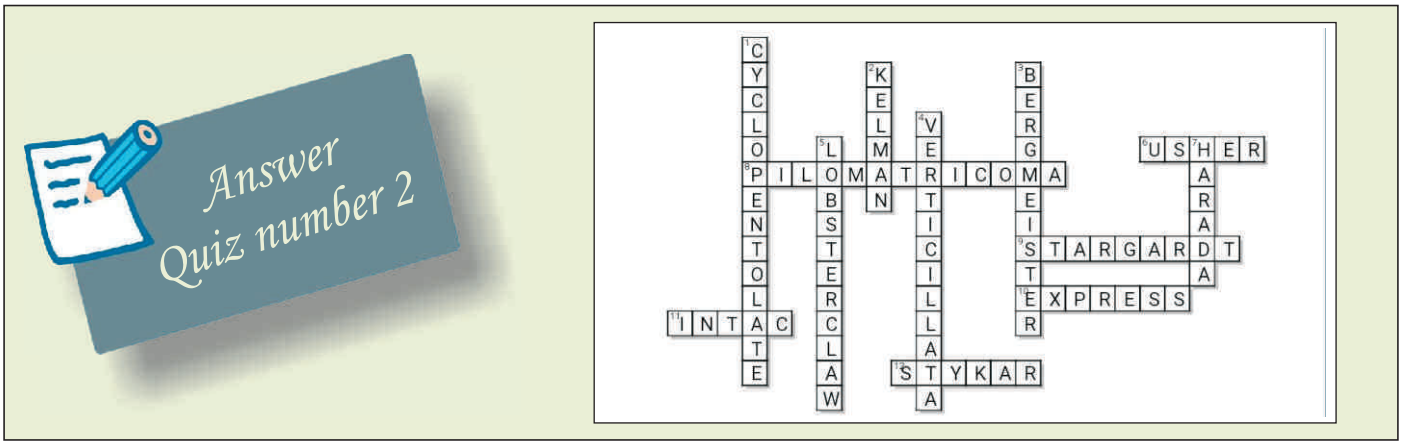
When to Prescribe?

Optical aids for near vision is used when the reduction of the distance between the object and the eye does not allow the necessary range or when the accommodative effort is too large.

At school age, with visual acuity up to 20/200 (6/60), reducing the distance between the object and the eye is recommended until the second grade. From this stage, a stand magnifier or a hand magnifier is used for reading small-print books such as dictionaries.

For VA less than 20/200 (6/60) (0.1 logMar), optic aids should be prescribed earlier. If the VA is less than 20/400 (3/60) and the central scotoma greater than 30 degrees, a video magnifier is suitable.

For VA equal to or less than 20/1200 (1/60) aids such as Braille and computer sound systems should be included, with or without other resources. Orientation and mobility techniques should be encouraged at all low vision levels.



Full Thickness Macular Hole following Intravitreal Bevacizumab for DME: A Case Report

Navendu Rai, MS, FAICO
Navendu Eye Care Centre, Deoria

Introduction

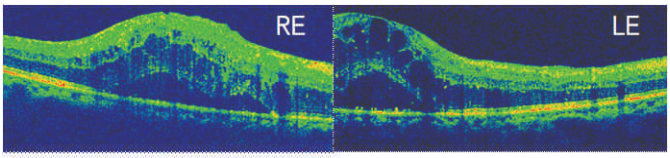
Anti VEGF agents have been in use for treatment of DME for quite sometime now. Ranibizumab is FDA approved while Bevacizumab is widely used as an off-lable drug with comparable amount of effectiveness and safety. The potential side effects are few and are either associated to the drug injection procedure (mainly) or to the drug. RPE tears, retinal ischemia, ocular irritation and cataract progressionare some of the main complications.[1] Other potential adverse effects are very rare, and include retinal tears, retinal detachment, endophthalmitis and intraocular inflammation.

Some cases of Macular hole development after intravitreal bevacizumab have been reported [2,3,4] but there have been only two reported cases of macular hole after intravitreal anti-VEGF for treatment of diabetic macular edema. [4,5] I report a case of macular hole development following administration of bevacizumab.

Case Report

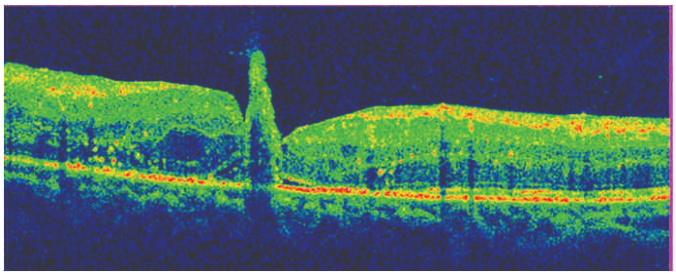
A 48 year old male presented with diminution of vision in both eyes. He was a diabetic for 9 years with poor glycemic control and controlled hypertensive for 5 years. On examination his best correctedvisual acuity was 6/60 in right eye and 6/36p left eye. Intra ocular pressure was 14 in right eye and 16 in left eye. On examination the anterior segment was within normal limits. On fundus evaluation, he had Moderate NPDR with CSME (central foveal thickness 541 µ and 502 µ respectively) and grade 3 hypertensive retinopathy in both eyes (Fig 1).

Fig1 (pre-injection)



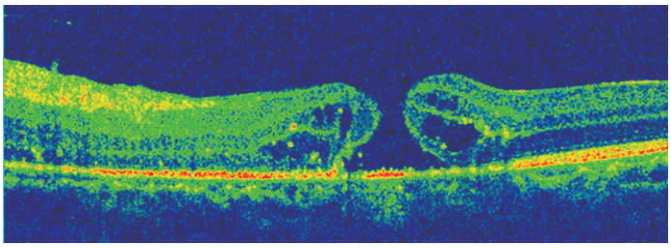
He was given intravitreal bevacizumab in both eyes in a gap of 5 days after taking consent for its off-label use in eye. OCT was repeated after 3 weeks of the injection. In right eye macular oedema reduced on comparison to pre-injection OCT. In left eyeOCT image showed some matter escaping or vitreous traction at fovea (Fig 2).

Fig 2 (3 weeks post bevacizumab LE)



After 2 weeks OCT revealed full thickness macular hole with reduction in cystoid oedema (Fig 3).

Fig 3 (5 weeks post bevacizumab LE)



The patient undervent PPV with brilliant blue assisted ILM peeling and the macular hole closed. Final visual acuity was 6/36.

Discussion

I have described a case of macular hole formation following bavacizumab injection for diabetic macular edema. Such case reports are very few and this is only third for DME.

To date, the exact mechanism of macular hole formation following intravitreal injections remains unclear.

The responsible factors have been assumed to exist at the RPE level, retinal surface, and in the vitreous. Induction of vitreous incarceration following anti-VEGF injections could enhance

vitreoretinal traction and subsequently MH development [6]. Chemical compounds introduced into the vitreous cavity and structural modification of the vitreous body following anti-VEGF therapy could also trigger incomplete posterior vitreous detachment (PVD), vitreomacular traction, and subsequent MH formation.[7] Intravitreal injections can increase vitreomacular traction due to globe deformation during needle insertion and vitreous incarceration at the insertion site following treatment.[8] This was proposed to cause vitreous syneresis and increase vitreofoveal traction leading to incomplete PVD, resulting in focal sites of traction on the retinal surface and MH formation. In this case, liquefaction necrosis of the M ü ller cells and adjacent neural cells due to persistent ischemia leads to cystoid macular edema, a known cause of MH formation.[9].I postulated that intravitreal bevacizumab injection might have had an indirect role in the development of MH formation by favoring the rupture of distended M ü ller cells and intraretinal cysts. In this case, the coalescence and breakdown of large intraretinal cysts after bevacizumab injection in the presence of serous macular detachment could have caused MH. At 3 weeks something is seen escaping from the fovea leading to macular hole formation, evident on OCT done 2 weeks ahead of this finding.

Conclusion

Macular hole formation following intravitreal bevacizumab injection is a rare complication which needs to be borne in mind while treating diseases like DM, CNVM, etc. Its pathophysiology needs more research work.

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Excellent Closure Rates after Macular Hole Surgery, Even without face-down positioning

This prospective multicenter trial evaluated closure rates after full-thickness macular hole surgery followed by a short-term nonsupine positioning regimen. Surgeons performed pars plana vitrectomy with ILM peeling and SF6 tamponade on 203 macular holes; 202 (99.5%) closed after a single operation. The median time of supine positioning during the first 24 hours was 28 seconds, as recorded by a device attached to each patient's forehead. Based on the excellent closure rates, the authors suggest rigorous face-down positioning may be unnecessary after macular hole surgery. Ophthalmology Retina, May 2019 |

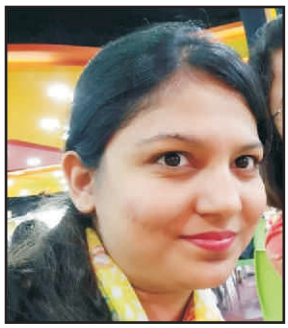
REVIEW ARTICLE

Role Of Atropine In Progressive Myopia

Anchal Tripathi, MBBS; **Kushwaha RN**, MS;
Mohan Shalini, MS, DNB; **Khan P,** MS; **Singh P,** MS

Abstract :

Worldwide, the prevalence of myopia has been rising dramatically, and it is estimated that 2.5 billion people will be affected by myopia by 2020.[1] South-East Asia is now facing a myopia frequency up to 95.5% in young academics,[2,3] but a rising trend has also been observed in recent European studies.[4] The high rise also includes prevalence of high myopia (<-6D; axial length>25mm), which in particular is associated with severe complications, such as myopic macular degeneration and glaucoma.[2] The absolute risk of severe visual impairment is 30% in individuals with axial length of 30mm or more.[5,6]



These dramatic figures create the need for effective counteractions. Current treatment options for progressive myopia can be categorized in conservative and pharmacological interventions.[7] The effects of the conservative regimens, except for orthokeratology are relatively small.[8] Pharmacological intervention has a much higher efficacy, in particular treatment with topically applied atropine eyedrops.[9]

Atropine, a non-selective muscarinic receptor antagonist (M-antagonist), is the most studied pharmacological agent for the intervention of progressive myopia.[10]

By the mid-1800s, atropine was frequently used in ophthalmology for pupillary dilation to examine the posterior segment of the eye and as a temporary treatment to improve vision in cases of cataracts. It was also used to induce mydriasis during cataract surgery and to prevent or break the posterior synechia in cases of uveitis. At that time, it was not used in myopia treatment.[11,12,13]

Donders (1864) was the first to recommend atropine as a treatment for myopia when he suggested it for suspected spasms of accommodation in myopic patients.[14] One hundred years ago, Pollock was the first to employ prolonged use of atropine for the treatment of myopia (for a duration of several months to almost a year); the therapy also required affected children to avoid reading and writing.[15,16,17] However, in the following decades of the 20th century, pharmacological treatment of myopia was not pursued. Few researchers from the 1930s to the 1990s conducted new studies.[18-30] As previously mentioned, several of those studies completely disproved the hypothesis of convergence as the main cause of myopia, as children in those studies continued to read with both eyes, and therefore converge, with no signs of worsening myopia. In spite the evidence of the effectiveness of atropine treatment, it was not popular among ophthalmologists and had notable detractors.[31-34]

Both concentration and frequency of atropine have been modified to minimize the side effects while trying to maintain the benefits. Chou et al. (1997) proposed that application of 0.5% atropine eye drops once per day was effective for slowing the progression of refractive error, even in children with severe myopia.[35] As mentioned earlier, this group of researchers had also compared different concentrations of atropine and concluded that although 0.5% atropine was the most effective, the drop out rate may have reduced its effectiveness. Therefore, in 1999 it was suggested that because daily drops of 0.1% and 0.25% atropine were well-tolerated, those concentrations could be used initially to control the progression of myopia in children with rapid progression or in those who tended to have severe or early-onset myopia.[36]

In 2015, Clark et al concluded through their study that atropine 0.01% significantly reduces the rate of myopia progression over 1 year with minimal side effects. It appears most effective in children with low initial myopia and may not control rapid myopic progression in some patients.[37]

It is uncertain how atropine acts to inhibit myopia progression.[38-43]

Initially, inhibition of accommodation was thought to be important, but subsequent studies have shown that atropine also inhibits myopia in animals (e.g., in chickens) that have no accommodative facility.[39] One theory is that atropine and other muscarinic antagonists may have biochemical effects on the retina or sclera, which in turn affect remodeling of the sclera.[40-41] Another theory suggests that increased ultraviolet exposure (secondary to pupil dilation) may increase collagen cross-linking within the sclera, thereby limiting scleral growth.[43] The sclera as the primary driver of axial elongation does not fit

however with the anatomical finding of a marked thinning of the choroid, most marked at the posterior pole and being in relative terms considerably more pronounced than the thinning of the sclera[44]. If the sclera was the primary tissue governing the axial length of the eye, one would expect a widening of the choroidal space. An alternative model could be to consider BM as the primary structure expanding posteriorly and compressing the choroid, most markedly at the posterior pole, and distending secondarily the sclera. This hypothesis is supported by several anatomical observations: (1) the volume of the sclera (and choroid) is not enlarged in axially elongated eyes, suggesting re-arrangement of available tissue without active formation of new tissue; (2) the thickness of BM is independent of the axial length; and (3) the goal of the process of emmetropization is the adaption of the length of the optical axis that ends at the photoreceptor outer segments. The first firm structure located closest to the photoreceptor outer segments is BM while the sclera is separated from the photoreceptor outer segments by the spongy choroid, the thickness of which additionally shows a diurnal variation. The notion of BM as the primary driver is supported by a recent study in which the biomechanical strength of BM in relationship to its thickness was about 50–100 times stronger as compared to the strength of the sclera (Girard, personal communication). This hypothesis also fits with the observation that the RPE cell density and retinal thickness in the fundus midperiphery decrease with longer axial length, perhaps due to the production of BM in that region leading to a mostly tube-like enlargement of the globe. If BM is the primary driver of axial elongation, the RPE producing BM as its basal membrane would be the target tissue. Interestingly, a recent experimental study on lens-induced myopia in young guinea pigs revealed that amphiregulin antibody if applied intravitreally was associated with a dose-dependent reduction in axial elongation[45]. The RPE has receptors for the epidermal growth factor with amphiregulin being a member of the epidermal growth factor family.

Rationale for treatment

Recently, several publications from Asia have reported efficacy of 0.01% atropine in myopia control while having lower rates of side effects. As a result, there have been renewed interests in the clinical implementation of atropine for myopia control.While most studies have reported active treatment period of 1–2 years, the optimal length of treatment is not known. One strategy is to adopt the ATOM 2 study approach with 2 years of initial treatment, followed by withholding treatment for 1 year, during which time any further progression is monitored. Children who progress after stopping treatment can be offered further treatment. Alternatively, some centers in Taiwan adopt the continuous treatment till late adolescent (around 15–18 years old), as myopia progression is known to slow down in the late adolescent period[46,47]. Some investigators suggest tapering instead of abrupt stop to prevent possible rebound effect; however this has not been studied in detail.

Side effects

Systemic side effects in the ocular use of atropine is uncommon, such as dry mouth, face flush, headache, increased blood pressure, constipation, difficulty in micturition, and central nervous system disturbances. The most frequent ocular side effects with atropine eye drops include photophobia, blurriness of near vision, and local allergic response. Among them, photophobia is the most common and its incidence is positively correlated with the concentration of atropine. All of the patients who received 1% atropine in the study of Yen et al. reported photophobia, and this was described as the major reason that led to over a half of subjects dropping out of the study[48]. In contrast, photophobia was reported in only 22% and 7% of participants who received 0.5% and 0.25% atropine, respectively. None of the participants in the 0.1% atropine group reported significant photophobia[49]. Similarly, photophobia was uncommon in children who received 0.01% atropine in ATOM 2 study, and only 7% of subjects requested photochromatic lenses.

Among the 34 participants (17%) who withdrew from ATOM 1 study, the reasons were hypersensitivity, glare, and poor near-visual acuity. As for ATOM 2, 4.1% children in 0.1% and 0.5% atropine group reported allergic conjunctivitis[50]. Reduction of near visual acuity was reported in the 0.1% and 0.5% groups, but completely recover by 26 months. Rarely, glaucoma may be induced by atropine. The incidence is as low as 1 in 20,000[51]. One study reported 621 children treated with atropine for 3 year and none found ocular hypertension[52].

Conclusion

In conclusion, results from research have demonstrated low concentration of atropine is useful in retarding myopia progression in a certain proportion of myopic schoolchildren. Atropine treatment has now been incorporated into clinical practice in some Asian countries. However, for optimal results, the motivation of parent and children is important, and long-term compliance and adherence with atropine treatment cannot be over-emphasized. Education regarding the consequences of high myopia and sharing the effect of myopia control to children and parents at each visit are helpful strategies to keep them motivated during the course of treatment. Individualized treatment protocol of atropine starting from low concentration seems practical. On top of atropine, good eye-care habits, enhancement of time outdoors and limiting near-work load should also not be overlooked. Though low-dose atropine treatment is promising in myopia control, there are still remaining areas of uncertainty such as treatment strategy and targeting population. Although the current prevalence of myopia in Europe is not as high as in Asia, the prevalence of myopia is steadily rising in Europe and

US as well. The clinical and economic burden will become significant with time, therefore further research on myopia prevention in European populations is important

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How to Become the Best Doctor & How to Build The Best Medical Practice?

Vidushi Sharma, MBBS, MD (AIIMS, New Delhi), FRCS (UK), Oculoplastic Surgery Fellowship (Australia)
Suresh K. Pandey , MBBS, MS (Ophthalmology, PGIMER, Chandigarh), Ant. Segment Fellowship (USA & Australia)
Director, SuVi Eye Institute & Lasik Laser Center, KOTA

The Art is long, Life is Short. -Hippocrates

The current practice of medicine faces many opportunities and challenges going forward. There are many forms of clinical Practice today, including Solo Practice, Group Practice, Corporate Practice, Institutional Practice and newer forms of Practice Consolidations and Mergers. There are also newer challenges (clinical establishment act, generic drugs, possible price cap on devices, Goods and Services Tax, etc), which have an impact on the way we practice medicine, and it is in our best interests to stay ahead of the challenges posed by these policy changes. With decreasing reimbursements, increasing cost of equipments and a changing economy, it may become increasingly difficult to stay afloat and flourish.

In this write-up, we share valuable pearls for the young doctors to overcome these challenges—from personal enrichment to building a practice and dealing with increasing patient loads and the eventual difficult patient.

What are qualities of best doctor to build best medical practice?

A good doctor needs to be a people's person at heart. Someone who enjoys interacting with all sorts of people. He/ she needs to be truly skilled in art and science of medicine and surgery, as modern medical science has really evolved to a very high level of precision over the last few years, and therefore the patient expectations have also risen dramatically. However, in this competitive and demanding world, both the science and technique as well as the art are important. And therefore, while it is quite enough to be a good surgeon and give good results, to excel, one has to learn good communication skills, strive constantly to give the best surgical results, as well as the best overall experience to the patients.

How young doctor(s) can imbibe these qualities?

Young doctors first and foremost need to learn and fine tune their surgical skills as best as they can, and the earlier, the better. At a young age, without the additional responsibilities of family and children, it is possible to travel to different cities and countries, and get the best possible training. Good surgical training is the bedrock, that no one can do without in today's age. Along with this, young doctors should also make it a habit to observe their seniors interacting with patients, particularly difficult and demanding patients. If you have plans of having your own practice, then you need to know the basics of financial planning and administration. Observe the facilities that are provided in good practices, and the small things that can make a significant difference to the overall patient satisfaction.

How these qualities can help young doctor to start and run a new medical practice?

By default, even today most young doctors end up starting their own practice, though the practice patterns are now changing rapidly, with more emphasis on group practices, shared facilities etc. When one starts a new practice, often they realize that the residency training has not prepared them for this at all. When managing a new medical practice, the doctor needs to go beyond clinical medicine to truly satisfy and manage a patient, and beyond patient management to run an efficient, financially viable growing medical practice. Someone said that "The education of the doctor which goes on after he has his degree is the most important part of his education". At this stage, we need to keenly and quickly learn the basics of practice management, in terms of staffing, administration, providing the right ambiance, marketing, communication and patient handling skills etc. in short, while we need to hone our surgical skills during training, we must also focus on our soft skills if we want to run a successful practice.

How to manage high volume patient workload in medical practice?

If you are fortunate enough to have a high volume patient workload in your practice, it often becomes a challenge to give enough time to each patient and fully satisfy them. Here effective communication skills become very important, where you can give all the necessary and relevant information in a short time, and utilize your chair time with the patient most efficiently. However, despite all this, there will be patients and attendants who need repetitive explanations and guidance, and

here the role of well trained staff, and particularly counselors becomes very important. We must utilize the services of well trained and groomed staff and counselors who can take over the work of explanations and can give the patients more time, thereby reassuring them and satisfying all their queries. Depending on the workload and the practice setting, we can delegate many other tasks to the staff members. For example our high volume ophthalmic practice, optometrists do more than half the work, and trained ophthalmic technicians perform investigations etc. However, it is important to keep motivating the staff regularly to provide their best services to the patients.

How to handle unsatisfied patients?

This is becoming an increasingly difficult but necessary art to master. We must take part of the blame for raising the patient expectations so high, that they have become very difficult to satisfy. A lot of aggressive advertising, tall claims and high surgical costs have convinced the patients that surgery (in branch like ophthalmology-for example cataract and refractive surgery) is a ten minute wonder, where nothing can go wrong, and the patient will get "super-vision". In this scenario, the first thing is to have good counselling for all surgical patients. Adequate chair time needs to be given so that the patient expectations are realistic, and there is no mismatch between their expectations and what can be delivered. Despite these efforts, if a patient ends up dissatisfied with the results, the first thing is to give a patient hearing. Many irate patients often cool down enough with a felling of having been heard and understood. Never try to brush aside their complaint, even if they seem insignificant to you. Patients will seldom create much trouble if the doctor is respectful and sensitive and hears them out, but with become increasingly aggressive of they get the impression that the doctor makes them feel inferior or is too rushed to listen to them. Also, it goes without saying that we must do the best that we can to solve the cause of their dissatisfaction, and be financially considerate while doing so to minimize patients to take course of consumer court.

How to market yourself early on for successful medical practice?

Marketing and image building is an essential part of practices today, and is no longer considered a unhealthy word in medicine. However, marketing in medicine bears a greater responsibility to be ethical and appropriate. We owe it to the dignity of our profession to ensure that our marketing is not in poor taste. Marketing is not synonymous with advertising, and aggressive advertising is still controversial among medical circles. Subtle marketing on the other hand is less expensive, often more effective and also acceptable. But with the increasing presence of corporate sector in the medical profession, advertising is here to stay. Marketing in the medical field can initially be cold call type like newspaper advertisements, billboards etc., where we make unsolicited contact with a wide audience. For a new practitioner, this is necessary as he needs to inform the widest possible audience in his area of practice about his services and expertise. Later, one can progress to inbound marketing using the internet and social media for potential customers, giving them a platform to ask queries and know you and your services before they choose you and in-house advertising, where the services available in your practice are prominently displayed in your own premises with clear information and staff is willing and capable to answer any queries related to these services. For a young practitioner, it is important to control the finances in marketing, and after the initial few cold calls, turn to more focused marketing and do not try to "outdo" competitors in advertising. It is also a good idea to organize educational awareness activities and camps at sites of public gatherings, which is a cheap and effective way to market yourself. Finally, you must aim for a scenario, where your satisfied patients become your best marketing tools, because this word of mouth publicity is the strongest and most convincing to potential customers.

How young doctors can take leadership role- e.g. presenting their in conferences and as office bearers of medical societies?

To grow professionally among peers, one needs to have good oratorical as well as public relation (PR)/communication skills. Start by attending the meetings of the medial societies in your area and offer to organize one or two activities at special occasions, where you can display your organizational as well as presentation skills. Societies always need young, dynamic people willing to take on responsibilities, without displaying any ego. Remember not to get involved in factional politics, and be respectful to all seniors.

How to grow medical practice?

If you can provide good services, the work is bound to grow. You need to ensure that you deliver not only good surgical results, but also ensure an overall good experience for your patient. This would mean that you focus on all services provided in your practice right from the ease of paring near your practice to the reception, waiting time, comfort in the waiting hall, adequate facilities for drinking water, toilets, refreshments, if needed, reading material to keep them busy while waiting, professional reasonable

quick service, cheerful and cooperative staff and an adequate explanation of fall their queries and concerns. Of course, the satisfaction provided by the doctor would be the main driver, and you need to develop your own soft skills and communication skills so that the patients feel reassured on meeting you, and you can inspire confidence in them. Learn to

connect with your patients and empathize with their concerns. As you grow, try to provide more services (like cornea and retina etc. in ophthalmology) depending on the financial viability.

How to manage the team of doctors, managers and other staff members?

If you have other doctors and managers/staff members working for you, it is crucial and often difficult to keep them satisfied and motivated. One crucial factor is opportunities for financial and/ or professional growth. Also, be accessible to listen to genuine problems of your staff and give them a patient hearing. Just like your patients, the staff also wants to feel heard and understood. Do small activities (for example we celebrate birthday of every staff member at our practice), to foster the team spirit among all the members, and make them feel valued. At the same time, also let it be known that you observe everything, and any misdemeanors will be strictly acted upon.

Managing yourself- How to work efficiently managing a busy practice and how to achieve work life balance?

In a busy practice, efficiency is important to ensure that the patients are seen quickly, and your working time also doesn't overstretch. Learn to delegate all except the core work. Develop a good team and employ good quality staff that can take off some of your burden. Have enough staff to guide the patients and answer their queries and develop effective communication skills yourself, so that you can give a quick yet comprehensive explanation to the patient about his/ her condition. If your practice is managed efficiently, this will leave you time for your family. However, the most important factor for achieving a good work life balance is to firstly recognize its need and importance. Remember that your work is just one aspect of your life, which cannot replace the equally or often more important aspects like health and family. Ambition is an endless race, and therefore work to satisfy yourself and not get ahead of others.

Violence Against Doctors: What Doctors can Do to overcome this Frightening New Epidemic?

There is increasing trend of violence against the doctors in India and it has become a frightening new epidemic. Almost every week, there is an incidence of violence against doctor or hospital. In today's world, sadly doctors do not hold the same place of respect as they did 15-20 years back and there is a steadily declining mutual trust and erosion of the doctor patient relationship. As a responsible member of medical fraternity, it is our duty to strengthen doctor-patient relationship and follow measure to prevent or minimize violence against doctors. Small and medium healthcare establishments are vulnerable and there are increasing incidence of violence against doctors. All the members of medical fraternity need to remain alert about violence and aggression against doctors. It is advisable to look for indicators of violent behavior such as staring and eye contact, tone and volume of voice, anxiety, mumbling and pacing (STAMP).

Violence and aggression against doctors can be minimized by following P.S.M.

P: Prevent or restrict entry of public. At no stage hordes of relatives should be allowed at the patient's bedside. Entry should be strictly by passes and this must be implemented through good security, preferably by ex-army personnel. Security guards and good quality CCTV cameras must be placed outside as well as inside the hospital at sensitive areas like ICU, Operation theater and casualty.

S: Strengthen Doctor patient relationship by Communication: As mentioned earlier, much needs to be done to improve doctor-- patient relationship. This must begin by the doctor informing the relative of what is going on. Always inform about the cost of the treatment, prognosis, need of repeat surgery and regular follow up, etc.

M: Medical Unity and Media: Last but not the least, medical community need to be united to handle the crisis of violence against doctors, especially by forming an whats-App group (Rush to Stop Violence against Practicenor: RSVP). United medical fraternity can also build pressure on Govt. to bring and implement tough law to protect medical professionals. The Prevention of Violence Against Medicare Persons and Institutions Acts, which have been notified in 19 states in the past 10 years, have failed to address the issue. To prevent violence against doctors, government spending on healthcare must be increased and the Indian Penal Code should be changed to provide for a tougher penalty that could act as a deterrent to violence against doctors. Also doctors need to ensure to publish their version in media so the balanced view can be published.

Take Home message for Young Doctors –

Young doctors can select their career path carefully. If they decided to pursue private practice keeping in mind that running your own practice is a huge work and responsibility. Think well before you choose what exactly you want to do. If you feel you are not cut out to handle all the responsibility (including clinical, financial, administrative etc.), choose another option like working in hospital or a shared facility.

If you do choose to have your own practice, the initial few years are very crucial and remember to focus only on patient satisfaction at this time. Also, remember to be strong even if there are minor setbacks. Keep the big picture in mind, and do not fret over small things. In the end, remember that the ultimate aim of life is to be happy and professional success is just one means of achieving that along with many other things.

Intraoperative Fundus Examination Using Air Bubble

Pankaj Lande, MBBS,DNB, Fellow Cornea & Refractive Surgery
Shraddha Tatte, MBBS, MS, Fellow comprehensive Ophthalmology
Shree Netralaya, Amravati (Maharashtra)

Examination of fundus before cataract surgery is crucial to know visual prognosis following it. One can expect full visual recovery following an uneventful cataract surgery in a person with normal fundus findings and no amblyopia. So, fundus examination consists of an essential part of pre operative work up for cataract surgery. But, sometimes it is not possible to visualize the fundus due to dense or mature cataract. In such cases, B scan can give a gross/rough idea about the status of posterior segment e.g presence of RD and posterior staphyloma. But the exact condition of posterior pole becomes clear only after the surgery or after the cataractous lens is removed. So, retinal examination including posterior pole and periphery during cataract surgery can give us a fair idea about the visual prognosis.

There are a few ways to examine the retinal status during surgery like using a Binocular Indirect Ophthalmoscopy (BIOM) wide-angle viewing systems which provides the surgeons with a panoramic view of the fundus with clear visualization generally used for vitreo retinal surgeries.

But these wide angle viewing systems have a high cost and the surgical microscope used for phacoemulsification surgery is usually not mounted by the BIOM system.

Another cheaper method could be using a head mounted IDO and holding a condensing +20 D lens in hand. But this again becomes tedious while operating.

In 1989, Asfour and Nassar described a much simplified and cheaper technique for fundus visualization during vitrectomy in aphakia. They provided a clear view of the fundus during surgery simply by injecting a small air bubble that fills one-half to two-thirds of the anterior chamber[1]

Faruq et al in 2017 in a prospective interventional case series of 23 eyes, concluded that the air bubble technique as visualization method for vitrectomy in aphakia is an effective and cheap technique for immediate management of complications of phacoemulsification surgery.[2]

We demonstrated the same technique of intraoperative fundus examination by performing indirect ophthalmoscopy using air bubble as a condensing lens without any need of specialized microscope or a BIOM wide field viewing system.

While doing indirect ophthalmoscopy, we use a high convex lens of power +13 to +30 D usually +20 D lens and a real, inverted and laterally reversed image is formed between the lens and the observer. So, in spite of using a condensing high power lens, one can simply inject an air bubble in AC which itself will act as a condensing lens and can examine the fundus intraoperatively.

After the cataractous lens is removed and remaining cortex is aspirated, a single large air bubble is injected into the anterior chamber. This air bubble acts as a condensing lens between the observer and the eye being examined and retina can be visualized. Our patient was a high myope with mature cataract, IOL power calculated being +2.0 D. As the cataract was mature, fundus examination before surgery was not possible. Thus, exact visual prognosis could not be explained to the patient. So, intraoperative fundus examination can prove useful in such cases to explain the prognosis and obtain proper consent (LEGAL IMPORTANCE) from the patient.

After cataract extraction, remaining cortex was aspirated which made the media clear. At this stage a single, large air bubble was injected into AC. This air bubble acts as a condensing lens and after adjusting the focus of microscope, posterior pole was visualized. The fundus showed PPA, macular scar, foster fuchs spots. This much information gave us a fair idea about the visual prognosis after cataract extraction and IOL implantation and helped us obtain the proper consent.

Taking an intra operative consent has a huge legal importance than post operative consent.

Thus, using air bubble can prove a simple, cheaper way of intraoperative fundus examination in cases where pre operative fundus examination is not possible due to dense or mature cataract without the need for costly instruments or specialized microscopes.[3]

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3. https://youtu.be/Udop3litnfc, a video by author on youtube channel "Dr Pankaj Lande"

R-MSICS

Pratyush Ranjan, DO, MS, DNB, MNAMS
ASG Eye Hospital, Varanasi

INTRODUCTION

The manual small incision cataract surgery (MSICS) evolved in 1980s after phaco became popular. Dr Richard Kratz was the first surgeon to think of scleral incision & "sclera-corneal" tunnel which improved wound healing & decreased post operative astigmatism, Dr Girard further improved it[2-4].Various shapes of incision were described to further reduce the post operative astigmatism. Dr Sanger introduced frown incision the current favorite in 1991[5]. The capsular opening technique also evolved from "can opener" to most preferred, continuous curvilinear capsulorhexis described by Dr Howard V Gimbel[6]. Similar innovations in nucleus delivery lead to wide optionsavailable to us now[7].

The R-MSICS or The Ranjan's Modified Manual Small Incision cataract surgery is developed by yours truly by a continuous active innovative process. R-MSICS has done away with all unnecessary steps, enabling it to be performed in less than 2 minutes with excellent visual outcome. The post operative astigmatism can be further reduced by using Ranjan MSICS Marker, which also helps in doing MSICS topically making it a truly refractive surgery.

Modifications :

1. No Superior rectus bridle suture : Its only benefit is stabilization of globe during surgery which can easily be achieved by any good toothed forceps or Ranjan MSICS Marker.

The complications of superior rectus bridle suture are dreaded and include globe perforation, muscle bleed/laceration, post surgery ptosis and diplopia. A dull aching pain after surgery is common and is attributed to bridle suture.

2. No Conjunctival flap : No conjunctival flap is created and no cautery is done. The initial incision of triplaner sclera-corneal tunnel is applied over the conjunctiva & sclera together in a single stroke. Many ophthalmologists prefer "No Flap" technique and outcome is comparable with MSICS with bridle suture[13]

The advantages & disadvantages of it are described below.

Advantages :

1. Precious limbal stem cells are preserved.
2. Cautery induced complications like scleral melt & induction of post operative astigmatism due to tissue shrinkage is completely avoided.
3. Active bleed at the conjunctival site and preserved episcleral tissue help in quicker healing.
4. Shortens surgery time – helpful in anxious patients.

Disadvantages

1. Incomplete cutting of conjunctiva along incision due to drag.
2. Bleeding may disturb the beginners in tunnel making.

3. Construction of sclero-corneal tunnel

Construction of sclera-corneal tunnel is similar to the conventional MSICS method.

The Ranjan MSICS Marker (RMM)(Fig 1) is designed to make topical flapless MSICS with greater astigmatic control a reality. It is designed to help in three critical steps of MSICS through its three different components[15].

1) The 360° Serrated edges at the base: It fixes the globe during tunnel making obviating the need of superior rectus bridle suture, obviating the need for peribulbar block & post surgery eye bandage. (Fig:2)

2) Tunnel Marker: It helps create perfect frown shaped 6 mm incision, 2 mm away from limbus. The measured location, length & shape of incision will help surgeons to reproduce their results. (Fig: 3)

3) Corneal axis marker: It helps plan incision on steeper axis, taking care of pre existing astigmatism. (Fig: 4)

The Tunnel & Corneal axis marker reduces post surgery astigmatism by placing least astigmatic incision in Koch astigmatic funnel on the steep angle taking care of both pre existing& surgery induced astigmatism.

The 0° & 180° meridian is marked using bubble marker in sitting position. Using pre operative keratoscopic data (K1 & K2), steep meridian of the patient is identified. After draping is done, the corneal axis marker is then aligned with pre marked meridians on the patient's cornea and steep meridian is marked. The RMM is then rotated to align tunnel marker axis to steep axis of cornea. A perfect frown shaped incision of 6mm length, 2 mm away from limbus is created using tunnel marker as stencil. The tunnel is created by stabilizing the globe by mildly pressing the RMM on the globe, the serrated edges at the undersurface provides excellent grip obviating the need for toothed forceps or superior rectus bridle suture.

4. Side port construction :

A triplaner side port of 2.2 mm is created using keratome micro surgical blade. A 2.2 mm side port enhances maneuverability, especially during the use of Eutrata forceps & reverse simcoe cannula. It is also astigmatically neutral.

5. Anterior Capsular opening :

No Change

6. Hydro-procedure :

Hydro dissection is performed using pearce hydrodissection cannula (26G, 35° angled with 8 mm flat blunt tip) is used. Fluid is injected at multiple sites to ensure complete hydro dissection.Once hydro dissection is successful, more fluid is injected between the anterior capsule and the lens in the horizontal meridian to "pop up" one pole of nucleus; this is the hydro-expression technique as described by Corydon and Thim in 1991[16]. Once a pole is lifted, more fluid is injected underneath it with simultaneous rotation using hydro cannula to prolapse the whole nucleus in the anterior chamber.

7. Nucleus delivery :

In most cases of R-MSICS, nucleus is delivered using "hydro delivery" technique. In this technique the pearce hydro cannula is used to deliver the nucleus out by cleverly coordinating four things. The nucleus is engaged on the angle of the cannula then it is slowly pulled out while depressing the lower lip and the water is egressed in bursts to push the nucleus out like rocket being lifted by thrust created by its exhaust.

In large nucleuses irrigating vectis is used to deliver the nucleus out of the anterior chamber.

Once nucleus is delivered reverse simcoe irrigation aspiration cannula of 21Gauge is used to clear remaining lens material.

8. Intraocular Lens (IOL) implantation :

IOL implantation is done under positive pressure created by reverse simcoe cannula inserted by side port using left hand. The IOL is inserted through the main port using angled Mc Pherson IOL forceps (Mc Pe) holding the optic. Once IOL enters the anterior chamber it is tilted down so that leading haptic is directed towards the capsular bag, the simcoe cannula is used to "depress &hold" the IOL to ensure "in the bag" implantation.Once the leading haptic is successfully guided towards the bag, Mc Pe is released and it now hold the tip of the trailing haptic and now using rotation motion trailing haptic is guided into the bag, while reverse simcoe cannula facilitating the rotation movement.

After successful implantation of IOL in the bag, the margin of the side port is then hydrated to secure the anterior chamber. Depth of anterior chamber and integrity of wound (as checked by sterile cotton bud) confirms successful completion of surgery.

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*by : **Dr. Foram Desai** , Aligarh*

1. Located in periphery of iris
2. Associated with Vitamin A defieciency
3. Feature of CRAO
4. Accumulation of axoplasmic material in nerve fibre layer
5. Ischemic infarcts of choroid
6. Senile scleral plaque
7. Myopic retinopathy
8. Epithelial opacities anterior to suture line of corneal graft
9. Anterior remnant of hyaloid artery at posterior surface of lens
10. Seen on FFA
11. Retinal hemorrhage with pale centre
12. Associated with POHS

A	C	N	I	L	E	F	K	P	S	X	C	S	G	Q	L	Z	G
Y	H	Z	N	D	C	G	Y	H	Y	F	Q	O	D	W	R	F	Z
V	E	P	B	I	T	O	T	Z	N	W	N	E	Y	Z	S	I	N
U	R	A	X	L	Q	B	N	K	S	E	V	B	Q	U	T	S	U
G	R	I	B	N	J	F	D	B	L	H	M	O	Z	X	K	C	P
X	Y	H	Q	P	G	R	O	K	M	L	I	Z	A	M	I	H	J
X	R	K	I	J	B	T	G	J	Q	N	P	S	L	V	Y	E	F
T	E	L	S	C	H	N	I	G	A	T	Z	B	T	C	L	R	W
F	D	Y	M	B	R	L	Q	U	E	Y	D	H	M	O	K	K	I
O	T	O	Q	L	E	K	V	X	Z	A	U	J	Z	T	X	H	D
C	L	M	I	T	T	E	N	D	O	R	F	B	V	T	S	U	K
R	C	W	H	D	X	O	R	S	K	Q	O	P	S	O	G	N	R
W	M	E	O	M	E	M	Y	H	I	M	S	T	Y	N	Y	T	H
P	D	L	J	R	L	Z	G	P	F	W	T	X	H	W	R	X	S
S	Q	A	D	B	H	R	M	F	L	K	E	M	T	O	V	M	K
L	M	N	E	O	R	L	E	O	P	A	R	D	C	O	W	T	P
H	F	U	R	I	S	U	T	W	N	Z	F	H	R	L	U	Q	G
R	M	K	A	Y	E	P	H	T	E	L	U	S	F	Y	X	Z	L
O	P	I	L	Z	X	O	M	L	Q	N	C	Z	O	T	F	N	X
U	N	P	T	D	Z	V	B	R	U	S	H	F	I	E	L	D	Y

The correct answers can be mailed to editorupsos 2018@gmail.com

Netra Kumbh (Mega Eye Camp): A Case Study from Uttar Pradesh

Santosh Kumar Kraleti
Technical Advisor NPCB, Hyderabad, Telengana

Brief about Netra Kumbh 2019, Prayagraj:

The world's largest vision screening program – Netra Kumbh 2019 was organized during KumbhMela in Prayagraj, India. It was a general eye screening camp to serve the devotees of KumbhMela (Fair). This mass screening program has been planned to screen for identifications of various eye ailments and provide free spectacle correction with proper advice for surgery (if required). The aim of the camp is to catch the eye ailment as early as possible so that timely interventions can help the population to enjoy their productive life and also helping the incurably blind.

Hence a well thought off and structured program with the combined efforts of SAKSHAM, participating organizations and many volunteers from across the nation started from 12th January 2019 to 4th March 2019. There were a total of 54 examination rooms that were equipped with instruments such as vision charts, auto-refractor, slit lamp and tonometer etc. A total of 570 Optometrists and 374 Ophthalmologists have participated in this vision screening program. The screening program involves; (1) basic vision screening including vision assessment, (2) objective and subjective refraction to determine the required spectacle power,(3) anterior eye examination to rule out any ocular pathology and (4) referral to the link hospitals.

Infrastructure at Netra Kumbh:

Total area allotted to Netra Kumbhis around 30,000 square yard.

S. No	Description	No.
1	**Total Area**	around 30,000 square yard
2	**Big hall for Registration and Waiting for the patients**	1
3	**Examination Rooms** There are 25 Double Rooms (Optometrist and Ophthalmologists Room side by side with same number)	54
4	**Pharmacy (3 Pharmacists)**	1
5	**Pathology Lab**	**1**
6	**Counters for distribution of Spectacles in separate big hall**	6
7	**Referral guidance and Counselling Hall**	1
8	**Hall for storage and fixing spectacles**	1
9	**Central Drug Store**	1
10	**One Conference Hall**	1
11	**One Meeting Hall**	1
12	**Dinning Hall**	1
13	**Separate Dinning Hall for Doctors**	1
14	**Doctors Room (tent) with attached Bathroom and toilet**	**38 (4 beds in room)**
15	**Dormitory For Optometrists and Volunteers (one for Females)**	**5 (25 beds in one Dormitory)**

Instruments / equipments available at Netra Kumbh

- Snellen charts
- Torch light
- Direct ophthalmoscope
- Tonometer at Glaucoma OPD
- Syringing set
- Sphygmomanometer (BP Apparatus) at General OPD
- Reagent for estimating urine sugar
- Box of trial lenses
- Retinoscope
- Dark curtains
- portable slit lamp
- Fixed slit lamp
- An indirect Ophthalmoscope
- Non Mediatricfundoscope (Retina) for Diabetics to detect diabetic retinopathy

Team

Eye Screening OPD (Netra Kumbh)	Overall Supervision by Management Team
Ophthalmologists	
Optometrists	
Volunteers	
General Health OPD	Overall Supervision by Management Team
Physicians	
Volunteers	

Camp and Examination Process: (OPD Timings: 8:30 AM to 4:30 PM)

Participants / Patients were arranged in gender wise separate Queues / Lines. Their registration (basic details) forms filled by volunteers (around 25-30 dedicated Volunteers on rotational basis) followed by assigning the Medical Registration Number (MR Number) at computer registration desk (here 11-15

dedicated volunteers on rotational basis (Entering form data into Computers and assigning the MR Number). Here patient also received the OPD Counter Number.Volunteers were available to guide the patients to optometrist room. Optometrist checked refraction of the participants and referred him / her to Ophthalmologist room. After careful and thorough examination, Ophthalmologist suggested some tests and/or prescribed medicine and/or spectacles or referred to referral room if surgery is required (as per need) to the participants after thorough check up. These participants were further guided by the volunteers for medicines, spectacle counters and referral and counselling station. Referral room provided referral slip to patients depending upon the area hospital (Networking of 21 private and 75 District Hospitals of Uttar Pradesh)

In Brief...

1. Step 1: Male and Female queues followed by Registration
2. Step 2: Screening – (Visit to Optometrist – Refraction measurement)
3. Step 3: Diagnosis - Visit to Ophthalmologist
4. Step 4: Treatment Room (Medicines and / or Spectacles, etc)
5. Step 5: Referral and Counselling for surgery (if required) and guidance for follow up.
6. Eye donation counselling station

Follow Up:

Eye Surgeries are limited in numbers. Line listing of surgical referrals may help in contacting people who need surgeries through mobile phones for counselling on surgeries because patient may not be ready for surgery as it is not an immediate need.

Here few limitations merit attention.

- Contact (Phone) numbers may change over a period of time
- Need a proper follow up mechanism
- Complete data of patients may not be noted during Netra Kumbh, i.e., some forms may not be completely filled and may not be entered properly in the computer excel sheet
- Refractive error data is not available in computer

Looking at Netra Kumbh Performance:

Gradually, attendance at the camp is increasing, as is the proportion of spectacles distribution and referral for operable cases. Day wise screening for eye ailments at camp ranges from few hundreds to thousands like on day one (12-01-2019) 679 people screened for eye ailments and the 6,637 people (highest number for the camp)screened on 26-02-2019.

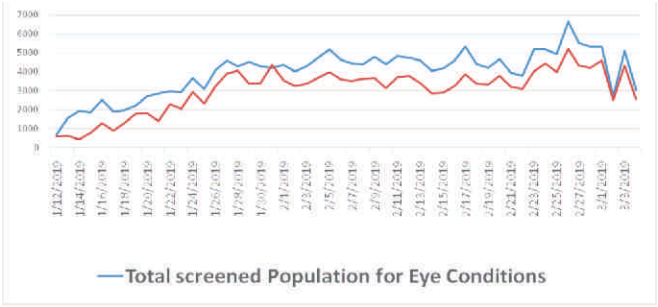
Overall, 202,020 population were screened with male / female ratio 3:1 (Male 64.75% and Female 35.22%). Mostly the participants were from Uttar Pradesh 93.7% (Prayagraj = 73.2%, followed by Pratapgarh = 3.1% and Jaunpur = 1.9%) followed by Madhya Pradesh 3.9% (Rewa 1.5%) and Bihar – 1.3%.

Focus group discussions with Ophthalmologists and Optometrists revealed that they are so much inspired by the arrangements and services of the Netra Kumbh that they will be pleased to provide services in near future. They also highlighted the importance of conducting similar type of camps at various events in various States.

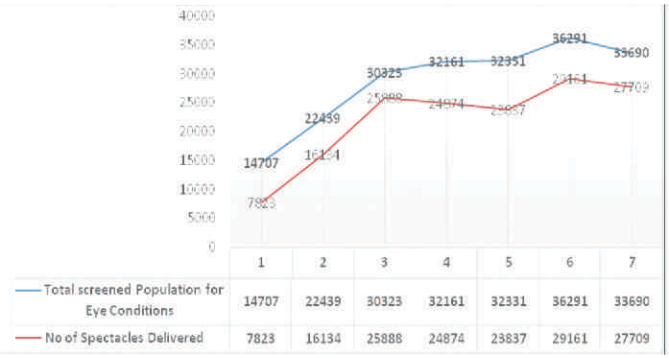
Team believes that outreach camps at mega event (Kumbh Fair) are an effective way of establishing the credibility of an organisation in the community as well as social marketing.

S. No.	Services	Number
1	Core Organizations for the Netra Kumbh	7
2	Service Days (Duration of the Camp)	52 (Jan 12, 2019 to March 4, 2019)
3	Population Screened for eye conditions	202,020 (Day wise **Performance Annexure I)**
4	Spectacles Dispensed / Distributed	155,210 (76.8%)
5	General OPD	21,000
6	Total Patients availed Free Lab Tests	4,500
7	Institutes / Hospitals who will operate for free in Follow up (list as Annexure - II)	43
8	Doctors who Volunteered on rotation basis	374
9	Optometrist who Volunteered on rotation basis	570
10	Volunteers for the Netra Kumbh on rotation basis	2,500
11	Hospitals	21

Day wise Performance of Netra Kumbh 2019



Weekly Performance of Netra Kumbh 2019



Other Services at Netra Kumbh:

1. Cardio Pulmonary Resuscitation (CPR) certificate Training provided to the volunteers, participants / patients, Optometrists, Doctors and Ophthalmologists by the team of Heal Health Connect.
2. Jal Seva (Availability of Water) for Participants / Patients
3. Free food services for All participants / Patients

Outcome, Recommendations / Suggestions:

- Netra Kumbh established that there is a huge need in the community for eye care. Nonetheless, National Program for Control of Blindness and Visual Impairment –(NPCBVI) is functional in UP but more emphasis provided on cataract and corneal problems. Hence, screening of common Eye ailments at the early age with appropriate eye care needs impetus in UP. Before Netra Kumbh, very less work of small organisations for eye care reflected. Netra Kumbh provided the platform for around 20+ Institutions / hospitals for working together collaboratively for such a big scale and divine cause.
- The Netra Kumbh also provided the community volunteering opportunity and great platform for professionals and philanthropists. The beauty of the Netra Kumbh is that everyone spent their own time and money to participate in the camp as a volunteer.
- Looking at huge success of the Netra Kumbh, Health Minister of UP Government has taken a serious consideration to start screening of eye ailments starting from few Districts of Uttar Pradesh.
- Netra Kumbh can be further improved...

o Public health program should be addressed from various platforms like Pulse Polio Program. Hence a Multipronged and multi stakeholder approach is required. Involvement of religious people at every stage will be helpful especially in highlighting about Netradaan and its importance in their sermon.

o Awareness Generation Programs will be conducted simultaneously for waiting participants either through session (20-30 minutes) or through mass media (video, Pamphlet, etc).

- Induction training on completeness of the patient record form, computer entry and step by step procedure on checking of eye aliments should be provided to the volunteers, Optometrists and Ophthalmologists.
- Registration of patient should be done directly into the computer and print out should be handed over to the patient.
- Netra Kumbh Data analysis and publications will help in categorizing the eye ailments, (eye disease burden) and its control. It may also help in policy formulation / modification.
- Use of TV News channels and spiritual channels like Sanskar, Sadhana, Aastha for awareness generation and highlighting the importance of Eye donation.
- Political commitment by involvement of political leaders
- Daily basis dissemination of the few findings: Post daily data on Twitter, News, Newspaper (news brief), emails to media
- Dissemination Seminar / Workshop would be the starting point to initiate the discussion with various Ministries for every State

20 Hospitals participated

1. AIIMS Rishikesh
2. Allahabad Medical College
3. Agra Medical College
4. BRD Medical College, Gorakhpur
5. BHU, Kashi
6. Amrita Institute of Medical Sciences, Kochi
7. Anand Eye Hospital, Aligarh
8. Global Eye Hospital, Allahabad
9. GSVM Medical College, Kanpur
10. Krishna Netralaya, Bengaluru
11. KGMU, Lucknow
12. LLRM Medical College, Meerut
13. Maharani Lakshmi Bai Medical College, Jhansi
14. Madhav Netralaya, Nagpur
15. LVPEI, Hyderabad
16. Sadguru Eye Hospital
17. Pushpagiri Vitreo Retinal Institute, Hyderabad
18. Sitapur Eye Hospital
19. RIMS, Manipur
20. Shankara Eye Hospital, Chennai

Other Organisations that need to be awarded or recognised

1. ACPL Architects
2. E&Y team
3. Essilor Foundation
4. Fire Safety, SVNU College, MP
5. Medtronic: CPR Training Institute
6. Model Optics
7. Paramedical institutions in & around UP - Rajesh ShuklaJi
8. PNI
9. RNS College, Bangalore
10. Voluntary Force by KBS Management Institute, Mumbai,
11. YFS, Delhi

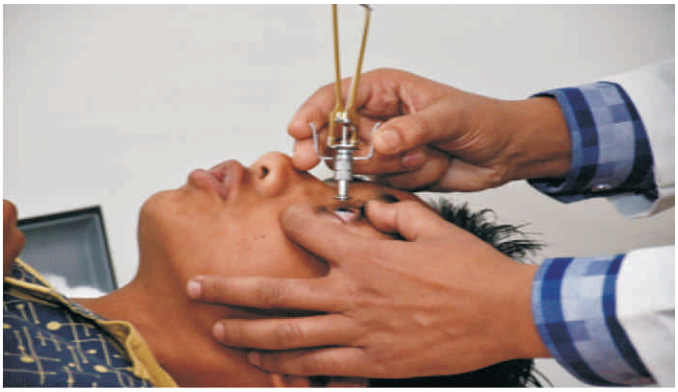
Photo Gallery :

Male and Female queues for Registration

Form Filling – Registration

Refraction

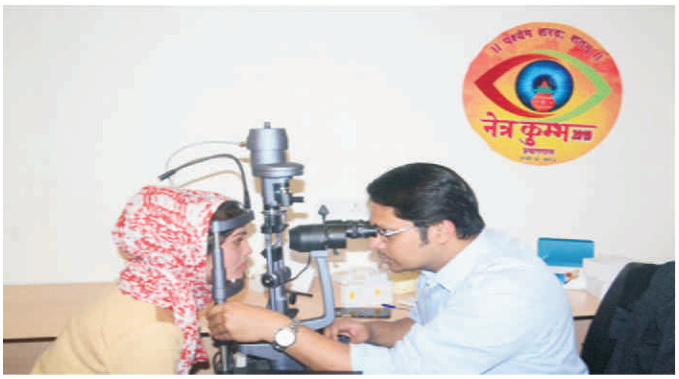
Assigning MR Number



IOP measurement

Screening – (Visit to Optometrist – Refraction measurement)

Distribution of Specatcles Room



Screening

Lab Services = 4,500 Beneficiaries

Laser Treatment in Presbyopia

Krishna Prasad Kudlu, MS
Director, Prasad Netralaya, Udupi, Karnataka

PRESBYOPIA :

Presbyopia is the physiological, progressive age-related loss of accommodation, mostly affecting individuals in their middle age, regardless of any underlying refractive error, causing difficulty in sharply focusing for near vision.[1–3]

Its correction has always been challenging for the refractive surgeon. The static methods for its correction seek to increase the depth of focus, which include: monovision, corneal inlays, presbyLASIK, corneal shrinking techniques (conductive keratoplasty, laser thermal keratoplasty and intrastromal femtosecond laser-based procedures), multifocal IOLs [4]. The dynamic methods such as scleral implants and accommodative IOLs attempt to restore accommodation [4]. A corneal approach seems the safest, since it is the less invasive procedure.

TREATMENT OPTIONS :

• MEDICAL

SPECTACLES: Bifocals/ Progressive/monovision Contact Lens

• SURGICAL

Lens procedures-	Multifocal IOL	Trifocal IOL	Accommodating IOLs	Extended range of vision IOL
Corneal procedures -	LASIK(Presbylasik/Presbyond/Monovision) Inlays			
Supracor/Intracor -	Sclerociliary complex modification - Scleral spacing devices/ LASER ACE procedure			

LASER OPTIONS IN PRESBYOPIA

PRESBYLASIK

The term PresbyLASIK was introduced by Ruiz in 1996 [5]; it is a surgical technique based on the principles of LASIK to create a multifocal corneal surface.It induces spherical aberrations to improve depth of field. It provides good near intermediate vision and reasonable distance vision.

There are 3 main types of multifocal corneal excimer laser profiles: 1) Multifocal transition profile, 2) Central PresbyLASIK, 3) Peripheral PresbyLASIK.

Approaches

Multifocal transition profile

It creates a transitional vertical multifocal ablation based on the creation of an intentional decentration of a hyperopic ablation profile. There are very few reports on this technique and it was not well accepted by surgeons because it induced significant levels of vertical coma [6].

Central PresbyLASIK

It creates a hyperpositive area for the near vision at the center and the periphery is left for far vision. It is pupil dependent and an advantage is that it can be performed at the center of the cornea in myopic and hyperopic profiles,and in emmetropes with minimal corneal excision. Its main limitation is the lack of adequate alignment among the line of sight, the central pupil and the corneal vertex, inducing coma aberrations.e, the central model is more advisable to achieve multifocality due to the physiologic pupil miosis during accommodation [7].

Peripheral PresbyLASIK

In this technique, the center of the cornea is left for distance and the periphery is ablated in a way that a negative peripheral asphericity is created to increase the depth of the field. One of its disadvantages is that when it is used in association with myopic correction, it is necessary to remove a significant amount of corneal tissue and therefore is mainly performed in hyperopes[6].

PROBLEMS IN PRESBYLASIK

- Initial compromise on distance vision (Blurred distance vision till 3 months)
- Adaptation problems to multifocality
- Night vision problems in initial period/contrast changes
- Pupil size dependent procedure

SUPRACOR

Is a pupil dependent, LASIK based procedure which is performed on the TECHNOLAS 217P Excimer laser system[8]. Unlike monovision where one eye is treated for distance and the other is treated for near, this procedure treats both eyes so that both are able to focus on distance and near vision equally.A 3mm central hyperprolate area is created which gives an add of approximately 2 dioptres[8]. It makes use of the central-near,

peripheral-distance concept wherein during natural accommodation when the eye focuses on near objects, the pupil constricts and the eye looks through the near-add elevation. When the eye is looking at a distance, the pupil dilates and allows the peripheral rays to pass through the aspheric optimized periphery to improve distance vision.

PROBLEMS IN SUPRACOR

- It is predominantly a hyperopic treatment, one tends to get a myopic outcome. Leads to an unsatisfactory uncorrected distance vision in considerable amount of patients.
- With the refractive target of –0.50 D spherical equivalent, this adds to the 2.0 D near add, thereby increasing the total add power of 2.5 D So , this procedure will be more suitable for age group from : LATE 40'S
- Patients are found to have large higher order aberrations like vertical coma &quadrafoil, causing considerable visual disturbances post operatively

Supracor can be used in one eye or in both eyes depending on each patient's needs and expectations. The asymmetrical technique is performed in patients that demand both near and distance vision, the symmetrical technique is for patients that demand good near vision

In symmetrical correction:

Targets -0.5 D of myopia in both eyes[9]

Helpful in patents who demand a very good near vision.

In asymmetrical correction:

Dominant eye is done plano, & non dominant eye is done myopic by -0.5D[5]

It gives good near and distance vision

PresbyMAX

PresbyMAX (SCHWIND eye-tech-solutions GmbH, Kleinostheim, Germany) is based on the creation of a biaspheric multifocal corneal surface with a central hyper positive area to achieve +0.75 to +2.50 D of near vision correction, surrounded by an area in which the ablation is calculated to correct the distance refractive error [10, 11□.PresbyMAX allows the safe and efficient treatment of emmetropic, myopic and hyperopic patients as well as patients with astigmatism whose accommodative response is restricted.

With the PresbyMAX module, it is now possible to choose between three different treatment types.

PresbyMAX Symmetric

Treats the dominant and non-dominant eye equally regarding depth of focus and the refractive target, thus ensuring optimal near vision.

PresbyMAX µ-Monovision

This creates the same depth of focus in both eyes. However, the dominant eye focuses slightly more towards near vision. The result: A faster visual recovery and better intermediate and far vision quality.

PresbyMAX ® Hybrid

This is the latest generation and is also based on different target values. But in contrast to µ-Monovision, a different depth of focus is generated in the dominant and non-dominant eye. This ensures an extremely fast visual recovery and an especially high quality of distance vision.

PRESBYOND- LASER BLENDED VISION

LBV is a non-linear corneal aspheric ablation profiles combined with micro-monovision to treat presbyopia in emmetropic, myopic and hyperopic patients

Laser Blended Vision: 9-in-1 Mechanism

- Monovision
- Vertex centration of spherical aberration
- Increased depth of focus
- Spherical aberration control [DOF without decrease quality of vision]
- Retinal image processing
- Neural summation
- Blur adaptation
- Neural suppression
- Multi-focality from epithelial lenticule

PRE REQUISITES

- Refraction & dominance testing
- Micromonovision testing
- Routine pre LASIK evaluation
- CRS Master planning software + MEL 80,MEL 90 (Carl Zeiss)

PRESBYOND® Laser Blended Vision is similar to monovision. It offers theopportunity to achieve freedom from glasses by combining thesimplicity and accuracy of Laser Vision Correction with the benefits ofincreased depth of field. It is an absolutely individualizedtreatment plan. This technique induces a controlled spherical aberration (to increase depth of field [12□. This micro-monovision strategy makes the imagedisparity from the two eyes smaller and the brain easily blends theimages together. A customized fusion of the twoimages for near and distance vision is created for each patient – this iscalled the "Blend Zone". Suitable from early 40's to late 50's

This new presbyopic profile is based on nonlinear changes in

asphericityThe dominant eye is mainly corrected for distance with a nominal target refraction of plano and the non-dominant eye is mainly corrected for near with a nominal target refraction of -1.50 D. As a result, the brain merges the two images, creating a blend zone, which allows the patient to see near, intermediate and far without glasses.

The important thing is to control the induction of spherical aberration to avoid increasing it above the neuro-adaptation tolerance threshold, which can cause loss of contrast sensitivity, night vision disturbances and can result in a topographic central island. To account for this, the non-linear aspheric ablation profile includes a pre-compensation factor for the induction of spherical aberration. This range was based on studies to understand the spherical aberration levels needed to increase depth of field [13, 14] and the 0.56-µm spherical aberration limit above which quality of vision might be subjectively affected as previously reported.[5]

Additionally, it can be used for emmetropic presbyopia as well as presbyopia accompanied by a wide range of refractive errors (published range: +5.75 to -9.00 D Intended Use SE range -8.00D and +2.00D, with maximum 2.00D cyl) including the simultaneous correction of cylinder. Performed as a bilateral simultaneous LASIK treatment, the bilateral procedure takes 10-15 minutes and recovers in a matter of a few hours. A further component of PRESBYOND is the increase in depth of field afforded by pupil constriction during accommodation: a component that persists even in eyes that have lost the ability to change crystalline lens power during the accommodative effort. The combination of controlled induced corneal aberrations and pupil constriction gives a significant increase in depth of field on the retinal image, albeit not a perfect image. In addition, intra-retinal and cortical processing and edge detection is the final component working in PRESBYOND: the pure retinal image, which is modified by spherical aberration, is further enhanced by central processing to yield the perception of clear and well-defined edges.

The final component of PRESBYOND relates to the epithelial thickness profile, which takes advantage of the fact that the epithelium remodels to compensate for any change to the stromal surface curvature.[16–20]

However, for lower levels of spherical aberration pre-compensation, a similar “multi-focal” change is being made to the stromal surface according to the spherical aberration component of the ablation, but the epithelial compensatory remodelling mechanism is able to fully mask this small stromal central island from the front surface topography – so the front surface topography appears normal. The result is an epithelial thickness profile overlying the stroma that looks and acts similar to a multifocal array lens due to the difference in refractive index between epithelium and stroma (1.401 vs 1.377).[21] This is then a very mild degree of induced point-spread function to supplement general increase in depth-of-field, and is something that can be tolerated by virtually all patients.

The multi-focality remains subsurface and cannot be seen on front surface corneal topography; it can only be seen by measuring the epithelial thickness profile. This method maximizes safety by eliminating the possibility of loss of lines, reduced contrast sensitivity, and reduced quality of vision as found in multi-focal corneal approaches

In summary, PRESBYOND draws on 6 mechanisms for its success as a procedure; depth of field is increased by:

1) A specific controlled increase in corneal spherical aberration

2) A sub-surface mildly multifocal epithelial thickness profile

3) Pupil constriction during accommodation affording further depth of field increase on the retinal image (cf pinhole effect)

4) Retinal and cortical processing for increasing contrast of the retinal image monocularly

5) An anisometropia small enough to be tolerated by over 95% of patients, which as a result of the above sphericalaberration induced increase in depth-of-field produces a blend zone and enable continuous distance to intermediate tonear vision between the two eyes

6) Central cortical processing of the spherically aberrated retinal image including neuronal gating and blur-suppression, butenabling simultaneous binocular vision (i.e. not monovision) and hence preserving stereo-acuity

PRESBYOND has excellent post-op

- Contrast sensitivity
- Stereopsis
- Negligible Crossblur
- Sharper & crisp uncorrected distance & near vision

The combination of induced asphericity and micromonovision with laser blended technique has had good visual and safety outcomes [12, 22–25], but the tolerance to micro-monovision may be inconvenient especially in patients with mild presbyopia, who are less tolerant to a larger degree of anisometropia than patients with advanced presbyopia [25]

MONOVISION

Presbyopia correction at the cornea can also be achieved with monovision, in which an intended anisometropia is induced, usually, the non-dominant eye is corrected for near vision, and the dominant eye for far vision, it depends on inter-ocular blur suppression. Good visual outcomes are achieved with this technique [26], but there is a loss of stereopsis which is related to the degree of anisometropia [27, 28], it is generally contraindicated in patients that need a good stereopsis to perform their daily activities such as airplane pilots [35, 36] or professional drivers [27, 29].

In short, achieving a multifocal cornea with stable and long term results remains a challenge [30, 8, 31, 32] to all refractive surgeons. The combination of different techniques for the correction of presbyopia (monovision, multifocality, asphericity modification) is a trending option [25] seeing that they benefit from the best qualities of each procedure

A prospective, non-comparative case series study was conducted in our hospital among 300 patients (600 eyes) with presbyopiain the age group 39 to 55 yrs (mean 47 yrs). The range of refractive errors was Myopia (-0.25 to-7.25DS), Hypermetropia (0.25 to 4DS) and Astigmatism between -0.25 to -2.75 DC,+0.25 to +1.5 DC. Target refraction was Plano for distance eyes (dominant eye) between -1.25 and -1.75 diopters (D) for near eyes based on age and micromonovision acceptance. (Non dominant eye:Target–1.5 DS (40%), –1.75 DS (53%),& –1.25 DS(in 7%))

All of them underwent routine preLASIK evaluation (Refraction, subjective acceptance, cycloplegic refraction for hypermetropic patients, slit lamp examination of anterior segment and fundus evaluation and Topography) along with Dominant eye testing and Testing for Micromonovision acceptance.

Laser Blended Vision – treatment planning was done and was integrated into the CRS-Master – MEL 80 platform.Standard LASIK procedure was done with Microkeratome: AMADEUS II(Zeimer, Switzerland). The flap had 9mm diameter, 120 micron thickness with nasal hinge. This was followed by ablation with Excimer: Mel 80 flying spot laser (250Hz) (Carl Zeiss Meditec, Germany)Post operatively they were treated with Prednisolone Acetate 1%, 0.5%moxifloxacin, 0.5%CMC. Follow up was done on day 1, 1 wk, 1 month, 3 month, 6 month, 1 yr, 2yr. 24 months minimum follow up was done for all patients.

92% of eyes achieved Spherical equivalent correction within -0.50 D and 100% of eyes within -1.00 D at 1 year follow up. Monocular uncorrected distance visual acuity was 20/20(6/6) at least in 70%, 20/32(6/9) at least in 98%. Binocularly 80% read 6/6 and 100% read 6/9. Binocular uncorrected near visual acuity was N8 in 3% and N6 in 97%of patients. All patients had a satisfactory intermediate vision (n6) Binocular distance vision subjectively was better than uniocular distance vision in significant number of people (60%) A higher number of patients read 6/6 binocularly (80%) than when checked through the dominant eye alone (70%). None of the LASIK LBV patients in our series needed enhancement procedures.

Adaptation: Most patients adapted well by the third month. Myopes beyond 42 years of age adapted very easily(1wk to 1month). Hyperopes, emmetropicpresbyopes, young patients (less than 40 years) took 2-3 months, to completely adapt. Only 6 patients had occasional adaptation issues, i.e. cross blur for distance, one patient reported confusion while reading fine print after this period which improved with lubricants. Night vision symptoms: 8 patients in 300 complained in 1st month, none at 3 months. None of the eyes lost more than ½ snellens line of vision when compared to preop corrected distance visual acuity.

CONCLUSION

There have been significant developments in surgery for presbyopiaover the last decade achieving relatively good outcomes but each modality has its own advantages and disadvantages and sometimes compromises. In fact the search for the restoration of true accommodation remains a challenge. Technological advancements have certainly moved surgical restoration of accommodation from a theoretical concept more into real ophthalmic practice, but much work still remains. The ophthalmologist should decide which surgical management is the best choice for each patient. The most important recommendation is to help patients to set realistic expectations, and together with the subject evaluation, predict the effectiveness of surgery.

WHAT IS THE BEST OPTION?...

TREATMENT	DIST VISION	INTERMEDIATE VA	NEAR VISION	NIGHT DRIV PROB	CONTRAST	ADAPTATIO N	SAFETY
MF IOL	FAIR	NOT SATISFACTORY	GOOD	YES	REDUCED	SLOW	FAIR
CORNEAL INLAYS	GOOD	GOOD	GOOD	YES	REDUCED	GOOD	FAIR
PRESBYLASIK	FAIR	GOOD	GOOD	YES	REDUCED	SLOW	FAIR
SUPRACOR	FAIR	GOOD	GOOD	YES	REDUCED	SLOW	FAIR
PRESBYOND	GOOD	VERY GOOD	GOOD	NO	NO CHANGE	FAST	GOOD

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Isolated Unilateral Congenital Sixth Nerve Palsy A Case Report and Review of Literature

Ankur Yadav, MS, FSPO.
Department of ophthalmology, Charak hospital and research centre, Dubagga, Hardoi road, Lucknow-226003. E-mail –ankuryd@gmail.com

Introduction

A congenital sixth nerve palsy is rare and may be related to birth trauma. The deficit often is transient, has a very good prognosis and usually resolves in the first month of life. The title of a Souza-Dias publication stated:"Congenital VIth nerve is Duane's Syndrome until disproven", and it also reflects the rarity of congenital sixth nerve paresis. A long standing VIth nerve palsy leads to secondary contracture of Medial Rectus (MR). The tight MR would cause retractionof the globe on adduction with consequent narrowing of palpebral fissure (PF), adding complexities to the clinical findings by mimicking Duane retraction syndrome (DRS) type I. Very few cases of long standing congenital VIthNerve palsy have been reported in the literature. We report a case of unilateral congenital VIth nerve palsy presenting to us with face turn and esotropia(ET)successfully managed by medial rectus(MR)recession.

Case summary

A 3-year-old girl presented to us with face turn to right side since birth. Ante, peri and postnatal history werenormal. There was no history of trauma or prior treatment forthe strabismus.Family album tomography (FAT) showed right esotropia (RET). The general and systemic examinations were essentiallynormal. The child was not cooperative for the vision assessment. Refraction under cylcoplegia revealed no significant refractive error. No abnormality detected in the fundus evaluation. Ocular examination revealed orthophoria with face turn to right side. On eliminating the head posture the Prism Bar Cover Test (PBCT) revealed esodeviation of right eye(RE) of 15 prism dioptre(PD). Fixing with RE (FRE) the esodeviation was more (20PD) suggesting an incomitant deviation.There wasmarked limitation of abductionof RE with widening of the PF onabductionwith mild limitation in dextro-elevation and dextro-depression [Figure 1]. Binocular functions on Worth Four Dot and RandotStereoacuity Tests could not be assessed.Forced duction testing revealed a tight medial rectusRE.A high resolution T1-weighted MRI (including fast imaging enhancing state acquisition [FIESTA]) at the level of

brain stem showed intact abducens nerve. The patient underwent 5 mm recession of right medial rectus(MR) by

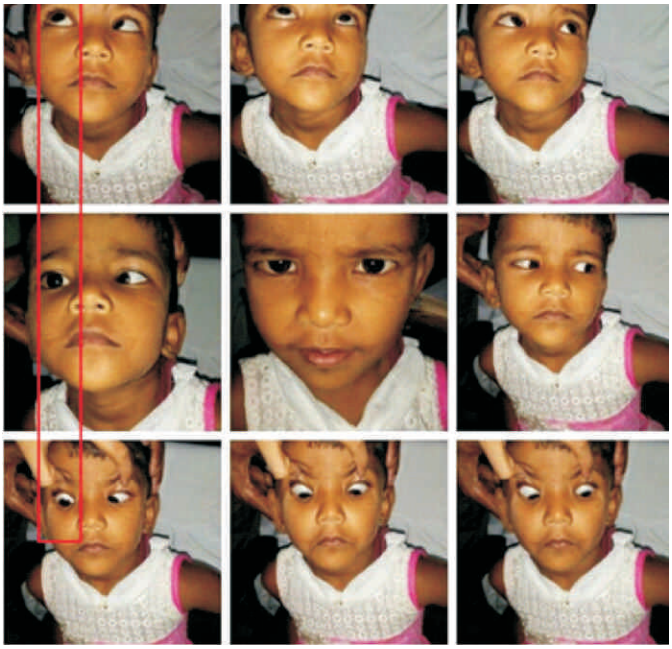

Figure 1: *Preoperative 9 gaze photographs showing marked limitation of abduction of RE with widening of the PF on abduction with mild limitation in dextro-elevation and dextro-depression.*

conjunctival limbal approach and standard technique. The patient was followed up onday 1, 7, 14 and 60 postoperatively. Postoperative examinationsrevealed orthophoria with elimination of head posture. Ocular movementsshowed improvement in abduction with reduction in abnormality in PF size in different gazes [Figures 2].A high resolution T1-weighted MRI (including fast imaging enhancing state acquisition [FIESTA]) at the level of brain stem showed intact abducens nerve.

Discussion

A congenital sixth nerve palsy is very rare and may be related to birth trauma. The deficit often is transient, and usually resolves in the first month of life. VIth nerve palsy occurs more commonly in children than in adults. The leading causes are neoplasms (range: 27–39%) such as meningioma, acoustic neurinoma, nasopharyngeal carcinoma and head injuries (range: 34–42%). , , , Less common causes are idiopathic, congenital, hydrocephalus, infections (herpes virus family, leptospirosis), otitis media, and others.7,8,

An esotropic DRS is more common than a congenital sixth nerve palsy. The clinical findings of head posture, ET in

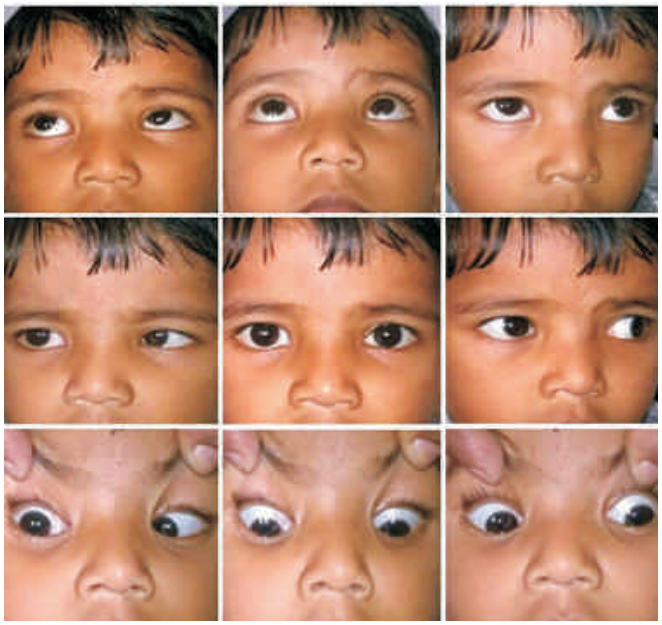

Figure 2: *Postoperative 9 gaze photographs showing orthophoria with elimination of head posture. Ocular movements showed improvement in abduction of RE with reduction in abnormality in PF size in different gazes*

primary position on elimination of head posture with restrictedabduction and associated narrowing of PF in adduction in our patient are consistent with Type I DRS. The primary position ET was relatively small as in DRS (less than 30 PD) compared to LR palsy or paresis. Although widening of PF in abduction is typical of DRS, PF narrowing is not a very dependable diagnostic sign of mild to moderate DRSas narrowing of the PF on adduction is usually interpreted as a passive adjustment of the lids to retracting globe. Our patient was diagnosed as a case of congenital sixth nerve palsy, with forced duction test for MR and absence of 'X' pattern seen due to anomalous LR innervations in upgaze and downgaze in DRS, pointing towards VIth nerve palsy.Besides,presence of abducens nerve innervationtothe affected LR on the MRI also rules out the pathogenesis of type I DRS as studies have shown that abducens nerve is frequently absent in type I DRS. , MR in children with DRS does not exhibit excessive stiffness or contracture in the primary zone, that is, it is normal. The alteration in PF size can be explained by a secondary contracture of right MR muscle due to a longstanding LR palsy, causing retraction of the globe on adduction with consequent narrowing of PF.4

On comparing the clinical features and postoperative results with a similar case reported in the literature by Agrawal et al.4, we found that our case presented with compensatory head posture to right with small ETof 15 PD in contrast to the previously reported case with 70 PD RET with no CHP anddemonstrated no binocular functions on Worth Four Dot and Randot Stereo acuity Tests. Though we could not elicit the binocular function in our case, the CHP proves that the patient had BSV. 5 mm of conventional recession gave satisfactory results in our case with orthotropia in primary position and elimination of CHP. Also there was no limitation of adduction postoperatively in contrast to the previous reported case who developed mild adduction deficit after the surgery. The probable differences in the clinical finding and postoperative results might be because of the difference in age of presentation in both the cases which was 3 years in our's compared to 14 years of previously reported. The MR fibrosis becomes denser with time without any intervention, leading to retraction of the globe on adduction with consequent narrowing of PF and upshoot. Besides, it also decreases the predictability of the results achieved by conventional MR recession.

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.....Pin : .....

Mobile No. : ..... E-mail : .....

Qualification	Institution/University	Year
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Registration No. and the State in Which Registered : .....

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NAME :.....

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No reasons will be given in case of rejection of the application
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Filling physical off line form and recommendation of 2 members is mandatory

Signature:

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The above application is in order and can be put in front of the general body of ratification. Dated.....

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Dr. Mohita Sharma
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Treasurer
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C/231, Sector-48
Noida-201301
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MIDTERM CONFERENCE OF UPSOS AT AMBEDKAR NAGAR-2019

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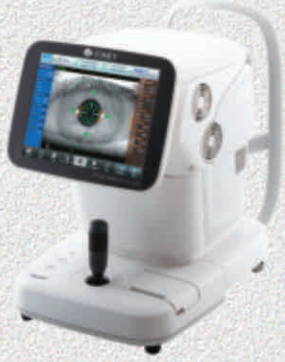
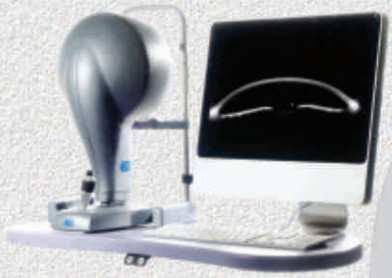
Optical Biometer with Topographer & Keratometer



CSO
Costruzione Strumenti Oftalmici

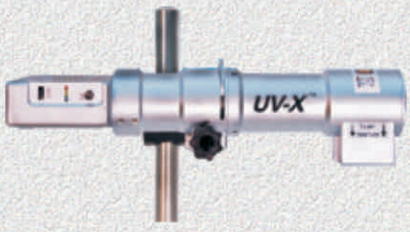
SIRIUS

3D Rotating Scheimpflug Camera & Topography System



IROC

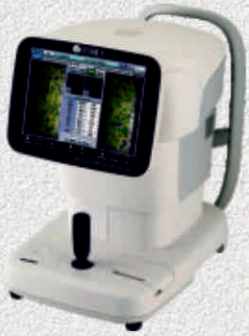
Illumination system for corneal cross-linking



TOMEY

EM-4000

Specular Microscope



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HEALTHSKAPE
MEDICALS PVT. LTD.

MY HEALTHSKAPE MEDICALS PVT. LTD.
4/425A, Sharma Ind. Estate, Walbhat Road, Goregaon (E), Mumbai - 400 063.
Tel.: 022 26862626 / 2828 Fax: 022 26862929 service@myhealthskape.com
www.myhealthskape.com