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DOS Membership fee Revision

Please note that DOS Membership Fee for new members has been revised to **Rs. 5,600/-** with effect from September 10, 2016.

Outgoing Executive Committee: DOS 2015-2017

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Prof. Kamlesh
Vice President


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Joint Secretary


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Dr. Rajat Jain


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DOS Representative to AIOS


Dr. Rohit Saxena


Dr. Ashu Agarwal

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Dr. Rajesh Sinha
Ex-Secretary


Dr. Sanjeev Gupta
Ex-Treasurer

DOS HALL OF FAME

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Tejpal Saini	Satinder Sabharwal
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Pratap Narain	Harsh Kumar
S.K. Angra	J S. Titiyal
G. Mukherjee	Harbansh Lal
H.K. Tewari	Namrata Sharma
R. Kalsi	Amit Khosla
D.K. Mehta	Rohit Saxena
P.C. Bhatia	Rajesh Sinha
K.P.S. Malik	M. Vanathi

Sincere thanks to all DOS OFFICE STAFF : Office Secretary: Parveen Kumar ◆ DOS Accountant: Sandeep Kumar ◆ DOS TIMES Assistant: Sunil Kumar
DJO Assistant: Varun Kumar ◆ Library Attendant: Niyaj Ahmad ◆ Office Attendant: Harshpal

"We'll meet again, Don't know where, don't know when,
But I know we'll meet again, some sunny day."
-Vera Lynn (We'll Meet Again)

LASTING IMPRESSION

"Far & Away, the best that life has to offer is the chance to work hard at work worth doing...."
– Theodore Roosevelt


Dr. M.Vanathi

Dear DOS Members,

As I spread my wings to soar away from the portals of DOS, I pen down the final adieu to you all. With the realization of the ending, dawns the happiness of having served well in the opportunity to carry forward DOS. I could not have prayed for a better ending and am happy to have achieved one that will leave a lasting impression for a very long time to come.

The closing issue of the **DOS TIMES 2016 – 2017** brings to you a wave of academics from India and abroad along with the reflections of DOSCON 2017. **DOSCON 2017** added another feather in the cap of DOS, being heralded as one of the best ophthalmic conferences in recent times. With an excellent assembly of scientific sessions of high caliber featuring renowned ophthalmologists from across India and abroad, it served to delight every delegate attending the meeting.

The changed **conference layout of scientific halls** enabled all delegates to move in and out of halls with ease to attend scientific sessions. The wonderful **bonanza of live surgery telecast** for the first time had seated dining in hall to facilitate the packed house to view the program nonstop from 9 am to 6.30 pm. DOSCON 2017 also had a much-appreciated **inaugural ceremony** featuring an amalgam of the three traditional dance forms of Bhartnatyan, Odissi & Kathak by renowned dancers Ms Priya Venkataraman, Ms Lipsa Dash & Ms Gowri Diwarkar. **The named orations** featured as a separate session and were delivered by eminent ophthalmologists. All other regular features of the conference were also well appreciated. **Special instruction courses, symposia** by renowned ophthalmologists from across India & abroad, apart from DOS session with various national societies (IIRSI, OTSI, OPAI, ACOIN, GSI) & the **cataract and refractive ESCRS symposia** (first ever in the history of DOS) ran to packed houses. An assembly of national and international faculty heightened the proceedings of the conference to wondrous levels. The refreshingly **new outlook of all our Fellowship dinner program** has also drawn wide acclaim. It is an extremely proud moment for the DOS executive 2015 – 2017 to proudly present to its members a conference that is to be remembered for a long time as a bench mark in the history of DOS.

Several firsts by this executive, introducing state of art audiovisual conference facilitations, ophthalmic photography competition, DOS ophthalmic premier league for two seasons & audience interactive sessions in its winter conferences, DOS enhanced specialty Korner (DESK) meetings international outlook and content in DOS TIMES, a thunderous performance of DOS members in the AIOS portals, remain highlights that will go a long way down the memory lane.

DOS has remained an academic body catering to all the academic needs of all the ophthalmologist of the society. It is open to collaborate with other organizations to look in to the pressing social concerns as well. As the curtains close on this executive, I am sure that you enjoyed our tenure as much as we did in crafting it for you with a vivid difference of excellence and caliber to create a **lasting impression**.

Wishing the next executive all the very best and closing with the words **Fare Thee well ..... till we meet again..**

With best regards

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Outgoing DOS General Secretary
& Prof of Ophthalmology
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Outgoing President's Farewell Message

Respected Seniors, my Teachers and esteemed Colleagues,

Dr. Rishi Mohan

Greetings from the outgoing DOS Executive!

It has been an exceptional honour to have represented this outstanding Society as its President over the last year and it gives me great pleasure to write this **Special Farewell Message** in this last issue of the current term of the DOS Times. This year has been special, as event after event, we had the opportunity to showcase the extraordinary talent that members of the DOS possess and the energy and zeal of the Secretariat and the Executive. A brief overview follows.

The singular, stand-out feature of the scientific undertakings of our august Society, the 9 **Monthly Clinical Meetings** of the DOS evinced renewed interest. Further efforts are needed to make the discussions more clinically-oriented, medically relevant and less didactic in nature.

The WinterDOS 2016 at the India Habitat Centre in November was innovatively combined with the DOS Residents' Training Programme (and which may well become the standard practice for the future). The Scientific programme saw a balanced mix of interactive sessions, panel discussions, posters, videos and photography contests, and probably **the Best live surgeries** session that I have seen, in variety, quality and content. The sociocultural event at the Kingdom of Dreams with the enthralling performance of the Bollywood style musical, was a one-of-a-kind experience for those who attended and **broke all previous records for the WinterDOS dinner attendance**.

The superlative **iDOS-COSL Meeting in Colombo, SriLanka from December 22-24, 2016** established the "international credentials" of the DOS with positive feedback from all quarters. In a first-time endeavor, delegate member groups from Delhi, Mumbai and Chennai were coordinated to come together in Colombo. There was a superb mix of scientific deliberation, relaxation, social events, sight-seeing and shopping. The participation of our SriLankan colleagues and the quality exchange of views and experience augurs well for the relations between our great Societies and our neighbours. Thanks are due to our Secretary, Treasurer and all Faculty and others who contributed to the success of the Meeting.

For a very long time, **DOSCON Scientific Programmes** have influenced scientific programme structures in other conferences across the country. This year too, **our Annual Conference, DOSCON 2017 Ophthalmic Spectrum**, has, beyond doubt, been one of the finest Conferences we've had. Changes and Innovations were the hallmark of this year's event and have been appreciated by all. **The ESCRS (European Society for Cataract and Refractive Surgeons)** conducted **2 Joint Symposia with the DOS** in the Conference. Gracing the occasion were the President of the ESCRS and 2 of its Past-Presidents, as well as other European Faculty.

Special sessions were held including a **Panel Discussion** on Optimising cataract surgical outcomes, participation by National and International Societies like never before with excellent **sub-speciality content**, as well as a full day of vibrant and robust **Live Surgery.**

The **layout of the Meeting was completely revamped which saw revolutionary** changes with the scientific Halls laid out together, the Lunch areas redesignated and the Exhibition structured in a monolithic, under-one-roof format. The structure on the dais with the informal sofa-style seating arrangement in all Halls brought in a personalization of the interaction amongst the Panelists and the audience. A brief and enthralling **Inaugural programme** was introduced, with the **National Anthem** sung, **lamp-lighting** and a classical dance performance to **showcase India's rich cultural heritage**. Our **respected 'named' Orations** were brought together in one special session. The concept of having the Live Surgery run without a break with Lunch served inside the Hall, along with all the other steps taken to make the Conference more stimulating, appealing and satisfying, have been applauded by all.

The **DOS Times**, the printed education and information organ of the DOS is unique in its outreach and has been modified and improved by the singular efforts of our Secretary, Dr Vanathi. It continues to be the most sought after publication in the ophthalmic fraternity.

It was unfortunate that we squandered the opportunity to host the **4th World Congress of Paediatric Ophthalmology** and **Strabismus and International Retinoblastoma Study Group Symposium,** in **December 2017** which is now being held in Hyderabad on the same dates. Had that gone ahead as planned, the DOS would have had the distinction of becoming the 1st state Society in India to host a World Congress.

The Delhi Ophthalmological Society, in this year, has once again proved, why it retains its **supremacy in the federation of Ophthalmic Associations** with the **quality of the Meetings, arrangements, scientific programme with eminent Faculty from far and wide, international content and participation, a second-to-none Trade Exhibition and social and cultural events** that were the talk of the town and the ophthalmic community. The sheer numbers of participating delegates in our Meetings was **second only to the AIOC Meeting** and proved that the DOS, with its attention to detail, delivers. This promises well for the future of our majestic Association.

Our **Delhi Members emerged victorious in the contests** for various key posts and committee memberships in the AIOS Elections earlier this year with great aplomb, reflecting the will of the people across the nation. That leaders from Delhi command the love and respect of a wide diaspora is a matter of great pride and a particular honour for the DOS. All winners owe a **small debt of gratitude to the platform** that propelled them to these heights nationally.

At the end, I must place on record my deep indebtedness to our Secretary, Dr M Vanathi, for the enthusiasm, unending energy and efficiency that she brought to the job which made the humongous task of running this remarkable Society, seem like a piece of cake. I'm grateful to our Past President, Dr Cyrus Shroff for his guidance throughout my term and to Dr Vipul Nayar, our dynamic and hard-working Treasurer for his hands-on approach to problems. I'm equally grateful to my entire Executive who have helped me shape the course of the Society through my tenure, to Prof Madan Mohan who always provided me with a role model and my family who stood by me through this time and were a constant source of encouragement.

I would like to re-iterate what Swami Sivananda once said

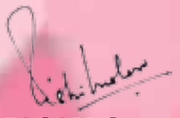
"Put your heart, mind, intellect and soul even to your smallest acts. This is the secret of success".

We should collectively strive to live up to that ideal and continue to ensure that the DOS retains its frontrunner status.

I wish the incoming Executive the very Best in guiding our Society through our journey forward.

Long Live the DOS! Jai Hind!!

With Warm Regards,



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Address by Incoming President, DOS: Prof Kamlesh

Dear Dr Rishi Mohan our outgoing President, all honourable Ex- presidents, outgoing Secretary Dr M Vanathi, entire executive members, Dr Sudarshan Khokhar, Vice President; Incoming Secretary Dr Subhash C. Dadeya and the new executive members, my respected senior colleagues, friends, ladies and gentlemen

Prof. Kamlesh

Good Evening to all of you

First of all, I would like to thank you for the confidence that you have shown in me by electing me as the Vice President last year which subsequently turned into becoming President of Delhi Ophthalmological Society by convention this evening for the year 2017-18. I assure you that I will do my very best to justify the trust and faith that you have bestowed upon me and will try to further strengthen the DOS - our justifiably proud society which has the fame of being the largest State Ophthalmic body in the world having more than 8500 life members today and many more in the coming years.

You have just heard about the activities of the society, the important achievements of our members and various other milestones of the previous year which make us proud. Dear friends, the respectable name and fame, acquired by our society today are due to its high scientific and academic standards which is the result of my predecessors by their dynamism and persistent hard work. Therefore we should not simply rest on our laurels but continue to strive hard as a dynamic process to maintain its glory and progress further. I believe that even if it seems that a society has reached its zenith, there is always scope for further improvement or refinements in one or the other existing fields.

Let me take today's opportunity to acknowledge the initiatives & tremendous hard work put in by our predecessors. Indeed they are an inspiration as well as a challenge for us to continue doing the great work that they began. I am certain that with their valuable guidance, this team that we have today, will be able to take DOS to further heights!

The areas of focus for the society in the coming years for me would be:

1. Academic and Research promotion to YOUNGSTERS, as they are our future leader and ophthalmic clinicians: I believe in the power of youth, and such help will enhance their involvement in the activities of DOS as well as their own career building.

My aim is to provide:

a. To explore the possibilities to provide unlimited online CME Material & Adequate number of online Journals for members to promote academic and research works. I firmly agree that to keep up with the speed of electronic revolution, DOS must launch online resource intensively which will offer discussion groups, archives, videos, articles, podcasting and industry supported information as well for the benefit of our honourable members
b. Travel Training Fellowship (Phaco and Speciality oriented) for youngsters
c. Speciality oriented Monthly Meetings followed by Wet labs/Hands on training for youngsters or those who need it.
d. Nominal Registration Charges for more and more participation in midterm or annual meet
e. DOST, Practice oriented courses, Career counselling & guidance
f. Increase in number of travel grant for attending national and international conferences for young members

2. DOS supported single window clinical platform to solve diagnosis & management dilemma in difficult cases
3. To Maintain Transparency: I will ensure utmost transparency in all the activities of DOS. All financial transactions will be made transparent and will be scrutinized by an internal committee which can pick up any irregularities in the same if any.
4. Family get-together functions for Delhi DOS Members: I'll organise get-together and recreational activities for DOS members and their families with get-together Dinner at the eve of Annual conference as it was practiced earlier.
5. Legal Cell for members: Legal cell is the need of hour and I intend to start the same so that unnecessary harassment of genuine members is addressed.
6. Constitutional amendments: Necessary constitutional amendments in the larger interest of the members will be carried out especially in context to recent development of permission granted to Ayurvedic eye specialists to perform cataract and other ocular surgeries.
7. DOS House: now it is high time to have our DOS office as DOS House especially centrally located during my tenure as President.

8. One Window Solution/Guidance to DOS members for registration to Nursing home as well as pertaining to all our professional problems with a solution and guidance.
9. Committee for TPA problems to solve inequality and unjust approach of insurance companies with the help of AIOS, DMA, IMA and others. Active Support and guidance will be sought from all senior and experienced ophthalmologists for this common concern.
10. Combating Amblyopia from Delhi: it can be done by demanding from the government that the Vision Certificate should be made mandatory at the entry level of school (like Vaccination certificate), giving us a 100% chance to examine each and every child for early diagnosis and complete cure from the DOS- Government combined platform.
11. Growing Assaults on Doctors (under Prevention of Violence and Damage to Property) Act - this issue needs to be discussed and taken up with other organisations i.e.: IMA, DMA etc.

I would like to inform you about the I-DOS, which is being planned in Dubai, and is going to be a great event in every aspect. The details will be available very shortly on our website and with the Office.

Dear friends these are some, but not the only concerns for which I am here to serve you to the best of my capabilities with the support of my new executive team in which I have full faith. I am sure for fulfilling my endeavour; I will get your support, sincere advice and blessings. Friends, "There is no I in Eye" We are a team and together we will continue to advance ophthalmic surgery, improve eye care for our patients, and work towards the noble goal of making treatable blindness a thing of the past.

Finally, I would like to extend my thanks to all my friends, well-wishers, my senior colleagues for all the help and my family members especially my wife Rita Maurya, daughter Dr. Kartika Anand and son Divyagat Anand for their love and selfless moral support towards DOS concerned activities.

God bless you, God bless DOS to live long, Jai Hind!

Prof. Kamlesh
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SECRETARY REPORT 2016-2017

Excerpts of report presented in GBM, April 9 2017

Dr. M. Vanathi

Honourable President Dr Rishi Mohan, incoming President Dr Kamlesh, and esteemed members of the GBM

On behalf of the executive committee of Delhi Ophthalmological Society, it is my privilege and pleasure to extend a warm welcome to you all to this General Body Meeting of the 68th Annual Conference of Delhi Ophthalmological Society 2017.
I wish to express my sincere gratitude and appreciation to all the members of the entire executive committee DOS 2015 – 2017 and all the members of DOS for extending their overwhelming support and encouragement throughout this current academic year & the tenure of this executive. This DOS Executive has the proud privilege of having seen several firsts in all its endeavours to raise DOS to greater heights and set standards in all fronts.

DOS Membership:

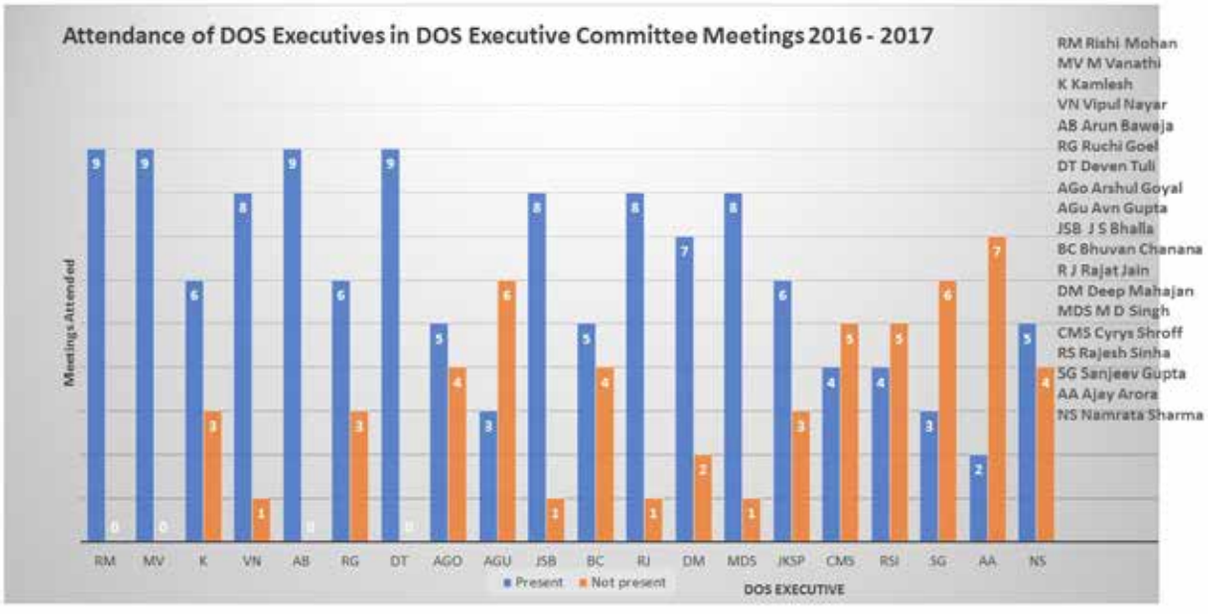
DOS is the world's largest state ophthalmological society with a current membership of 8448 members. We are happy to announce an addition of 416 new members to our society (119 from Delhi) and extend a warm welcome to them all. As we continue to revel in the appreciation and commendations received as the best state ophthalmic society in India, holding this coveted position close to our heart, our pledge and commitment to take it up further needs to get stronger.

DOS Membership Drive:

Several benefits were extended to residents to encourage them to become DOS Members and enjoy the huge academic benefits offered to them by DOS. The DOS Membership drive enabled us to amass an addition of over 250 members to our society this year. The addition of Rs 500 to the membership fee per new member enrolled towards the digital services costing has been well received.

DOS Executive and Subcommittee Meetings:

In this year's tenure, the DOS Executive discussed its business in 9 meetings (8 routine & 1 emergency). I sincerely appreciate everyone in this executive for all its constructive suggestions towards raising the performance standands of DOS in all aspects. The following chart depicts the participation of the executives in all our executive meetings.



Several meetings of the various DOS subcommittees constituted this year (DOS monthly meeting review subcommittee, DOS house subcommittee, the Day care centre subcommittee, the appellate, disciplinary and ethics committee subcommittee, the awards subcommittee, the TPA subcommittee, the financial advisory subcommittee, the academic, fellowship and research subcommittee, election commission and election appellate committee) have provided wise deliberations on recommendations for effective functioning of DOS in various aspects including the DOS election, DOS monthly meetings, DOS house, disciplinary & appellate and awards.

We wish to express our sincere thanks and appreciation to all the chairpersons (especially Dr M C Aggarwal – DOS House subcommittee, Dr P V Chadha, Dr Noshir Shroff – Ethics, disciplinary & appellate subcommitte, Dr Cyrus Shroff – monthly meeting review subcommittee, Dr A K Grover – TPA subcommittee, Day Care Centre subcommittee, Dr R V Azad – Academic, felowship & research subcommittee, Dr J S Titiyal – Awards Subcommittee, Dr Kamlesh – Legal & Insurance subcommittee, Dr Lalit Verma – Financial advisory subcommittee) and members of the various subcommittees of DOS for taking out valuable time from their hectic schedules to assist this executive with their constructive recommendations in the related aspects. There is still scope for more work in all these arenas which could perhaps have been possible with more broadened time frame. This executive worked hard to locate suitable property to purchase for DOS house and commend the efforts of our treasurer Dr Vipul Nayar for taking out time to inspect the various places.

On behalf of the president and the entire executive, I wish to express my sincere gratitute to the chief election commissioner Dr G Mukherjee and the election commission members Dr R B Jain & Dr J C Das for their incredible service of meticulous nature, rendered for successful conduct of DOS Elections 2017. It is indeed a pleasure to observe and learn the various nuances involved and the tremendous efforts invovled in taking on this responsibility for the society.

DOS Monthly Clinical Meetings

The nine DOS monthly clinical meetings (DCM I – IX in the months of July 2016 – March 2017) that have been held each month, were of high academic standard. The format of two clinical case presentations, one guest case presentation, one clinical talk & mini symposium continued in all meetings. The current revised format of DCRS system which has been adopted gives significant weightage to all the concerned elements of monthly meetings. The timing schedule format has been introduced for all monthly meetings also ensured that all presentations conformed to the time slots allotted, enabling all meetings to start and end on time.
Much deliberation has come out into the forefront on the need for revising the format of the monthly clinical meetings and I am sure the next executive will look into it.

Other meetings and events of DOS

DOS participated in the events of the following

- World Sight Day participation (October 8, 2017) by its members holding free screening OPDs (Shroff eye centre and Chadha Eye Centre) and Eye Donation Fortnight participation in the Eye donation awareness walk in conjunction with the National Eye Bank, AIIMS

DOS Times 2016 - 2017

DOS Times, the bulletin magazine of Delhi Ophthalmological Society strongly holds its forte as the most popular and most widely-read ophthalmological bulletin in India. DOS Times 2016 – 2017 series has been seen a further hike in its popularity quotient besides its international outlook with international standard scientific content. This has continued to draw wide acclaim form prominent ophthalmic fraternity across the country. Each of the six issues per year (July- August, Sep-Oct, Oct- Dec, Jan- Feb, Mar-April, May- Jun) covered comprehensively all the sub-speciality sections of ophthalmology making it appealing and useful to all readers with its coverage of all the latest concerns and topics in ophthalmology. The new sections of innovations, practice requisites, clinical spotlight, diagnostic discussion, DOS crossword besides the other regular sections were immensely appreciated by all readers. I wish to specially thank Dr Uma Sridhar of Icare Hospital for compiling Diagnostic discussion, Dr Manish Mahabir (RPC) for setting out the DOS cross word Dr Abhishek Dave (SCEH) and Dr Devesh Kumawat (RPC) for DOS Quiz and their help to organise their respective sections in this current year. The dedicated work & efforts put in by Mr Sunil Kumar – editorial assistant of DOS TIMES need special mention here.

DOS TIMES 2015 – 2017 maintains its quotient as a standalone service drawing sizeable income for the society that extends additional support towards covering the expenses of DJO as well. I wish to place on record a special mention of appreciation for Mr Ashish Agarwal of New Puspak printers for his printing services, for providing us excellent quality & timely printing services for DOS TIMES and all other printing requirements for DOS.

DOS TIMES can be accessed online for current and archived articles as well (www.dos-times.org) by all DOS members. This year, the postal delivery of DOS TIMES was clubbed all issues of DJO as an effort to curtail expenditure on postage to the society. With rising costs of printing and postage given the increasing numbers of DOS members each year, expected

decrease in company sponsorships given the current economic scenarios and in keeping with the efforts to promote GOING GREEN and to convert to being more paperless, the possibility of running electronic versions is being strongly suggested by many.

DOS website (www.dosonline.org)

DOS website www.dosonline.org with its sophisticated outlook, upgraded and user friendly navigation options provides huge scientific resource material, ONLINE LIBRARY services all of which play a significant role in maintaining the society's popularity with ophthalmologists across the country. The website continues to showcase in an organised manner the various tabs of special sections for the members including access to the online directory, member's sections, news and updates, access to the DOS times and DJO and information about all DOS activities. DOS website navigation is faster with the use of latest software to make it faster and lighter. Online facility for Profile update is very user friendly and efficient to help members update their address changes and current addresses in no time. Other regular features of information on website access microdetails are also available.

This year we have introduced the MEMBERSHIP ONLINE APPLICATION PORTAL (MOAP) for DOS Membership applying process to benefit easy and smooth functioning in processing all paperwork related to applying for membership, scrutiny of records and documents, membership fee payment and verifications – which needs coordinated efforts from DOS head Staff Mr Praveen Kumar, Accountant Mr Sandeep, the secretary and treasurer. We hope this facility from this year on will ease the time and labour involved in processing membership applications and enable all to work from their office portals and make the application process more user friendly.

Special mention of the services of our website service provider Mr Aman Dua needs to be placed here for the exemplary services of this team.

DOS Winter Conference – winterDOS 2016 & 9th DOS teaching program (DOST 2016)

The DOS winter conference now called as WinterDOS 2016 on the theme of "Ophthalmic Vista" was held in conjunction with the 9th DOS Teaching (DOST 2016) on the from the 11th to `13th of November, 2016 at India Habitat Centre. For the first time, the teaching program encompassed live surgery telecast to postgraduate students and residents who along with the conference delegates were able to enjoy watching a panorama of ophthalmic speciality live surgeries. This was hugely successful and widely acclaimed for its new outlook, scientific program assembly and content, new features by faculties and members both from within and outside Delhi. Smooth seamless high definition transmission and organisation of live surgery workshop on the 11th of December from Dr R P Centre and CFS was immensely appreciated by a full house. This winter DOS also witnessed the good trade participation and conference pre-registration, even in the wake of the troubled times of demonitisation at its portal footsteps. New interactive sessions in cataract & refractive scenarios, the second season of DOL 2016 – Delhi Ophthalmic Premier League, and other sessions were a huge hit. Winter DOS 2016 also saw phenomenal response for the new introduction of physical POSTERS and there was an enthusiastic participation in this. OPHTHALMIC PHOTOGRAPHY competitive display session was introduced in last year winter DOS, first time in the country, also continued this year. The winter DOS 2016 fellowship dinner program for the first time witnessed the much applauded and enjoyable evening with the ZANGOORA program in the Kingdom of Dreams. A blood donation camp was also organised during the event by Dr Rajesh Chocker.

AIOS Elections 2017

I wish to express my appreciation to all the contestants from DOS who contested in the recently concluded AIOS Elections 2017 – with DOS fielding the highest number of contestants and also reaping the highest number of wins. I extend my hearty congratulations to Prof Namrata Sharma & Prof Rajesh Sinha, the winning team as AIOS General Secretary & treasurer, Prof M Vanathi as Joint Treasurer & member Scientific Committee, Prof Ruchi Goel as Joint Secretary, Prof Rohit Saxena as Member North zone of ARC and Dr Lalit Verma for being elected unopposed as Chairman Scientific Committee.

68th DOS Annual conference – DOSCON 2017: Ophthalmic Spectrum

The 68th DOS Annual conference was organized April 7 - 9, 2016. The conference was named `DOSCON 2017 with the theme of "Ophthalmic Spectrum' spanning a three day bonanza of rich academic extravaganza, scientific content, full day Ophthalmic LIVE SURGERY showcasing with the highest ever participation from all ophthalmic companies, along with a fantabulous ophthalmic exhibition show. DOSCON 2017 this year two has surpassed last year's figures witnessing the highest ever overall registrations both for delegates and exhibition participation. DOSCON 2017 scientific programme featured several new attractions in terms of introduction of DOS – ESCRS sessions in refractive and cataract arena, select instruction courses from reputed faculty across the country, Wet labs training sessions in Contact lens & phacoemulsification, special sessions with several national societies, Symposiums, Alumni gatherings in DOS annual conference apart from all other regular features of free papers, e-posters, e-videos, ophthalmic photography, and DOSCON Quiz. DOSCON 2017

also treads with the pride of being the first in featuring the INAUGURAL CEREMONY of the conference with a special show of dance invocation recital (ARPAN – an amalgamation of the three traditional dance forms of India - Bharatnatyam, Kathak & Odissi). DOS orations featured as a special session in a novel attempt to elevate the significance attached to the various named orations of DOS with a never before assembly of eminent ophthalmic surgeons of the country, hailing from Delhi decorated the podium with their engrossing orations. We have also been able to successfully experiment with the new layout for our conference with establishment of 5 scientific halls besides the main convention hall keeping all academic halls together and providing the benefit of slipping into any of the desired halls with ease, which will bring a new dimension to the performance quotient of DOS conferences. The DOSCON 2017 fellowship dinner was held for the first time in the Jawaharlal Nehru Stadium hosting well attended dinner that was ornate with a spectacular assembly and show of Bollywood musical singers and performers.

DOS Library

The DOS library is a popular service providing excellent academic resource materials to ophthalmologists across the country. I would like thank the library officer Dr Deven Tuli for his efforts to keep the DOS online library in order. The current contract renewal with OVID which provided the services for DOS gives us access to 7 online international indexed journals, 45 e-books. There is a current significant increase percentage in the quotes for this service which the incoming executive will perhaps explore to their advantage.

Delhi Journal Ophthalmology

Delhi Journal of Ophthalmology is much sought after by resident ophthalmologists, both in Delhi and around the country. It has been published regularly and distributed to all the members. I would like to thank the editor, Dr Ruchi Goel for the work that she has put in maintaining the journal. and obtaining E-ISSN number, indexing in Index Copernicus, Journal Seeker Research Bible, Open Academic Journal Index, J gate, Cite factor, Indian Science abstracts and Google scholar. There have been more than 400 online submissions, of which 149 articles have been published in the last 8 issues of 2016 – 2017.

DOS House

Our executive has been tirelessly looking out for a good DOS house option and Dr Vipul Nayar has been doing the rounds of inspection for the various property choices. We hope something would materialise in near future as it now imperative that our society needs to have a permanent office from which the staff and executive can function from.

DOS Financials:

It is indeed my proud privilege to announce the superb performance of this executive in providing sound financial collections during the year 2015 – 2016 with our profit quotient touching 8 figures for the first time in the history of DOS. We have met with resounding confidence all the expenditures related to the various DOS activities and extended huge benefits to attending faculty and delegates in terms of state of art facilities in conferences, audiovisuals, appreciation tokens for all faculty and delegates, conference dining and entertainment events of world class calibre.

Awards & Orations

The following are the recipients of the LIFE TIME ACHIEVEMENT awards for 2017 and the various named orations of DOSCON 2017

Name of Award	Recipient
Life Time Achievement Award	Dr A K Gupta
Life Time Achievement Award	Dr J C Das
Dr Om Prakash Oration	Dr Milind Pande (UK)
Dr. P.K. Jain Oration	Prof V P Gupta
Dr. S.N. Mitter Oration	Dr Mahipal Sachdev
Dr Harimohan Oration	Prof Atul Kumar
Dr B N Khanna Oration	Dr Harbansh Lal

The recipients of the various trophies have been elaborated later.

OTHER ACTIVITIES OF DOS

Joint DOS COSL i-DOS 2016 meeting:

The Joint DOS – COSL iDOS 2016 meeting held in Taj Samudra alongside the lovely shores of Colombo in Srilanka, hosted by the College of Ophthalmology of SriLanka along with DOS in December 22 – 24, 2016 was a grand success. The meeting showcased a proud display of DOS members delivering fine lectures in various ophthalmic specialities to the entire

ophthalmic ensemble of Srilanka. The fellowship dinner and an evening of 'Christmas in Colombo" made this meeting a true mixture of international academics and fun & frolic. I wish to extend my sincere gratitude to all the faculty and delegates from India and Srilanka who participated in in this meeting and contributed to its success.
Expenses for the meeting was Rs 427117 and income was 590019.

WSPOS 2017 meeting with DOS:

The loss of the opportunity to host the 4th International meeting of WSPOS which was being proposed to be held in New Delhi in conjunction with winter DOS 2017 meeting in December 2017 is indeed a huge disappointment to the ophthalmic fraternity of DOS. This will perhaps open portals to analyse the shortcomings in our constitution and to make it more conducive to host such international meetings in future in Delhi.

Acknowledgements

I wish to acknowledge the tremendous amount of support extended to DOS by **Dr R P Centre for Ophthalmic Sciences**, all the faculty and residents to all academic activities of DOS. My sincere gratitude goes out to the chief of Dr R P Centre, AIIMS – Prof Atul Kumar for providing all infrastructure support to house the DOS office and his immense wisdom and constant guidance in making every DOS event a wonderful success.

The DOS ensemble owes its efficient functioning supremacy to the backbone support afforded by the **DOS Staff**. The diligence and hard work of the DOS office staff particularly Mr Parveen Kumar who masters every task entrusted to him with meticulous execution and his mastery in secretarial assistance skills deserves a special mention. Mr Sandeep is our hard working and committed accountant, who works tirelessly under the able guidance of Dr Vipul Nayar our treasurer to keep all accounts in order, with such ease that is amazing, given the immense load of finances that goes through the DOS account each year. Mr Sunil, our editorial assistant who coordinates the typesetting of DOS times with me and works overboard to meet all demands for every issue and for all conference related documents settings. Mr Babu our library staff, assists Dr Deven Tuli in DOS library maintenance with dedication and sincerity. Mr Varun, DJO editorial assistant continues the good job with DJO setting. Mr Harshpal our office attendant, is resourceful in handling any situation posted to his care. My special thanks to you all who work with me like family to give the best output to DOS.

I wish to thank all the **members of the executive**, who have stood by me and supported me in all the activities and all the members of DOS who have provided invaluable inputs to improve the working of the society and participated in large numbers in all academic initiative of this executive.

Our **Treasurer Dr Vipul Nayar**, is our general in armour with amazing sharpness in financial matters. I had applauded him earlier for the support as that of a brother he gave to me, from which he has never faltered. He as treasurer has fulfilled every requirement of his office demands with meticulous perfection and commitment.

I am indeed blessed with the most coveted privilege of working under the able guidance of the some of the best presidents DOS has even seen, **Dr Cyrus Minoo Shroff in 2015 – 2016** and **this year 2016-2017, Dr Rishi Mohan**, doyens in Indian ophthalmology, who with their exemplary personification of the role of presidency have enabled me to take DOS to heights as never before.

Dr Rishi Mohan's eye for detail kept such constant vigil on my performance, that perfection was mediocrity and excellence was the rule. His steering skills are one of a kind, deftly guiding me through all highs and lows in the past year. His expertise in mastering the nuances of negotiation angles has enabled us to make our treasury difficult to deplete. The new adoptions and ventures for DOS would not have been possible without his able guidance, support and strength. I give my salutations sir to you and Dr Cyrus, for the opportunity to excel as your secretary and will cherish this privilege for a lifetime.

As I welcome our **incoming president Prof Kamlesh**, we look forward to a wonderful DOS under his captaincy in the next year.

I wish to express my special thanks to our **two past general secretaries – Dr Rajesh Sinha & Dr Rohit Saxena** for their support and guidance at all times.

All my contributions to DOS would not have been possible without the incredibly phenomenal support of **my husband Ganesh & daughter Meghna** who never winced at allowing me to devote all my family time to the functioning of DOS.

I thank the **Almighty** for this tremendous opportunity to be at the helm of affairs for DOS the past two years.

I have left no stone unturned in decorating DOS with laurels galore during my tenure. In this past two years, I have toiled with my heart, mind and soul to set higher standards in all ventures of DOS, steering the society forward both academically and financially. I have strived hard to lead this society with an embodiment of grace and elegance as an academic body.

Before I conclude I wish to acknowledge **every DOS member** who entrusted me with this singular honour of holding the reigns of DOS as your General Secretary and sincerely hope that I made you all proud in all that I did. I am at loss for words to express my gratitude to you all and will forever treasure this opportunity to serve you.

Closing with best regards

Dr M. Vanathi
Honorary General Secretary, DOS

Sincere Appreciation to DOS Staff

DOS Executive 2015-2017 expresses its gratitude and appreciation to all the judges of DOSCON 2017 Free Paper, E-posters, Ophthalmic Photography and E-video presentations.

Prof. B. Ghosh
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Dr. Charu Khurana
Dr. Ritika Sachdev
Dr. Sarita Beri
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Prof. Neelam Pushker
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Dr. Poonam Jain
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Dr. Meenakshi Swaminathan
Prof. Amit Gupta
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Dr. Manisha Acharya
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Dr. Vivek Gupta
Prof. V.P. Gupta
Dr. Monica Gupta

Current Concepts in Managing the Posterior Polar Cataract

Seng-Ei Ti, Soon-Phaik CHEE

Posterior polar cataract (PPC) surgery is well known to be associated with an increased risk of posterior capsule rupture (PCR), vitreous loss and dropped nucleus. The PPC is a form of congenital cataract which may be inherited as an autosomal dominant disease or may occur sporadically. The lens opacification presents as a circular or discoid plaque with onion-like concentric white rings, located at the posterior pole of the crystalline lens. This round plaque consists of abnormal lens fibers, tightly adherent or incorporated into the fragile or defective posterior capsule. In progressive PPC, the polar opacity enlarges because of posterior cortical spokes radiating from and coalescing around the polar opacity. This can occur with concurrent age-related nuclear opalescence. Pre-existing posterior capsule dehiscence may be present in both soft and hard PPC. The likelihood of PCR has been linked to the size of the PPC opacity (Kumar)[1] and co-existing nuclear density.

SURGICAL MANAGEMENT

Many surgical techniques to minimize PCR have been described. Regardless of technique, the key principles remain the same, namely, to maintain integrity of the polar opacity and epinuclear plate until the nucleus has been removed. Most surgeons advocate similar precautions: avoid hydrodissection, avoid nuclear rotation, maintain the anterior chamber space when instruments are removed from the eye by providing appropriate tamponade and protection of the posterior capsule with dispersive viscoelastic substance, avoid over-inflation of the capsular bag and lastly, avoid direct contact (eg lens haptic tip touch) with the posterior capsule.

Creation of a centered round or oval capsulotomy that is 5-5.5mm in diameter is a very important step in the surgery. If PCR occurs, optic capture can help to stabilize the intraocular lens (IOL). However, the capsulotomy should not be too small, thus making removal of the epinucleus challenging.

SOFT POSTERIOR POLAR CATARACTS

The basic tenet supported by Osher[2] and Vasavada[3] is to avoid cortical-cleaving hydrodissection. Instead, separate the polar opacity from the central nuclear fibers using a wave of fluid (hydrodelineation, Hayashi[4], Allen & Wood)[5]. The nucleus is then aspirated or emulsified using modest to low phaco parameters, leaving removal of the polar opacity within the epinuclear plate to the last. This step may be facilitated by the injection of dispersive viscoelastics (Allen and Wood, Fine)[6] under the anterior capsule rim to release the epinuclear plate and posterior polar opacity from the posterior capsule (viscodissection). An alternative to conventional hydrodelineation which is performed after capsulotomy was proposed by Vasavada[7]. He termed it "inside-out delineation". In this technique, a central trough is sculpted, followed by injection of fluid through one sidewall of the central nuclear substance at the depth of the trough. The fluid passes from inside–out and delineates the central core of nucleus from the epinuclear plate, avoiding inadvertent subcapsular fluid injection. Rotation of the nucleus and epinuclear plate are avoided.

HARD POSTERIOR POLAR CATARACTS

Avoiding PCR in the dense PPC poses an even greater challenge. Hydrodelamination is not possible and inadvertent hydrodissection may occur.

Lim and Goh[8] had suggested to prechop the dense anterior epinucleus from the mid-periphery, opening the nucleus like a clam before mobilizing and performing sequential segmentation of the denser endo nuclear lamellae. The posterior epinucleus shell is dealt with last.

Chee[9] described a technique of chopping the nucleus without disturbing the central posterior polar region. A modified stop and chop technique is used and an evenly-deep central trough is initially created. The nucleus is cracked at the extreme ends of the trough only, avoiding the center. The phaco tip is placed deep in the center of the trough. A Nagahara chopper is used to horizontally chop the heminucleus against the side of the phaco probe. This effectively chops the nucleus

Figure 1: *"Spider pattern" of 8 segments and 2 rings. The circular ring incisions help to lamellar dissect the denser core nucleus*

into 2 quadrants, above the plane of the epinuclear plate. The phaco tip then holds on to the distal quadrant while the Nagahara chopper dissects a fragment free from the epinuclear shell associated with the polar opacity. A lamellar chop is performed by using the Nagahara chopper to manually dissect a plane between the lamellae of the nucleus. This core nucleus is then peeled away from the nuclear shell and emulsified. The proximal fragment is removed similarly. The second heminucleus is easily mobilized after this, and may be aided by viscoelastic cushion and the last quadrant can be manipulated out by suction using bevel-down phaco tip and flipped out of the capsular bag. Dispersive visoelastics may be helpful in aiding the separation of the epinuclear plate from the posterior capsule.

FEMTOSECOND LASER ASSISTED CATARACT SURGERY (FLACS)

The authors, like Vasavada[10] have found the femtosecond laser to be helpful for managing the PPC. This is especially the case when the nucleus is dense. The underlying strategy of creating a cleavage plane between the posterior polar base and the rest of the nucleus above can be effected by the femtosecond laser using "pneumodissection" and customized cleavage depths. However, excessive cavitation bubbles from too much laser may also distend the bag severely and stress the posterior capsule, therefore the laser pattern should be considered carefully.

An advantage of the femtosecond laser machine is the inbuilt anterior segment optical coherence tomography, which allows for imaging of the posterior polar opacity size, depth and location, and essentially facilitates customization of depth of femtosecond laser cut penetration, to avoid the area of the polar opacity. The width of the posterior safety zone (laser depth distance from the posterior capsule) is intentionally increased in PPC cases to create a safe cortical cushion, thus protecting the posterior capsule. A combination of radial fragmentation and concentric rings helps to achieve the desired segment fragmentation. The core nucleus is pre-dissected, thus reducing the need of the Nagahara chopper movements to manually create a lamellar dissection plane within the nucleus. This reduces manipulation in the eye and is therefore easier to manage and safer.

IRRIGATION AND ASPIRATION (I/A) OF CORTEX

The key is not to disturb the AC fluidics in a dramatic fashion. Cortex removal is performed with lowered infusion bottle height. The cortex, present in the equatorial region, is stripped toward the center of the capsular bag, and the posterior polar plaque is untouched until the end. Dispersive OVD and/or air is injected to maintain the anterior chamber before the I/A tip is removed. Polishing the posterior capsule must be avoided.

All the above manoeuvres help to protect the posterior capsule to avoid PCR. Despite all the care taken to safely remove the nucleus, the posterior capsule may still rip during cortex aspiration. This rip often extends from equator to equator across the centre of the posterior capsule. Nonetheless, vitreous loss and dropped nucleus are avoided and often, a single piece premium intraocular lens implant can still be safely implanted in the capsular bag. If a 3 piece IOL is place in the sulcus, optic capture should be performed to stabilize the IOL.

In conclusion, the management strategies for PPC focus on minimal disturbance of the posterior epinuclear plate with the polar opacity until the nucleus has been removed. With current femtosecond laser technology, this has enabled customized nuclear dissection, facilitating the removal of the dense core nucleus with greater ease and safety, creating a cortical cushion, thus protecting the posterior capsule in a dense PPC and avoiding a dropped nucleus.

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Posterior Polar Cataract: From Basics to Advances

Twinkle Choksi, Sonia Maheshwari

Posterior polar cataracts can pose a challenge for cataract surgeons in cases involving adherence between the posterior capsule and the posterior aspect of the lens. In these cases, there is a higher risk for posterior capsule rupture and resultant vitreous loss, leading to anterior or posterior vitrectomy and possible retained lenticular material. It is usually inherited as an autosomal dominant disease, yet it can be sporadic with incidence ranging from 3 to 5 in 1000[1-3]. It is found to be bilateral in 60-80%cases[4-5]. There is no sex predilection in general.

A posterior polar cataract is a round, discoid, opaque structure that is composed of malformed and distorted lens fibers located in the central posterior part of the lens. It consists of dysplastic lens fibers, which, in their migration posteriorly from the lens equator, exhibit progressive lens opacity and increased degenerative changes. This results in the formation of a characteristic discoid posterior polar plaque-like cataract and the accumulation of extracellular material. Often, this opacity is adherent to the lens capsule, thereby making surgical removal uncomplicated.

PATHOGENESIS

The position of lens opacity is largely determined by the anatomy of the lens and the timing and nature of the insult during embryogenesis. The developing lens requires nutrition that is obtained through the tunica vasculosalentis (TVL), which is a vascular network, supplied posteriorly by the hyaloid artery, a branch of the primary dorsal ophthalmic artery, and anteriorly from an anastomosis with vessels in the pupillary membrane. It has been suggested that posterior polar cataracts are caused by persistence of the hyaloid artery or invasion of the lens by mesoblastic tissue[6-7]. It appears that posterior polar cataract forms during embryonic life or early in infancy and usually becomes symptomatic 30–50 years later. The exact pathogenesis of posterior polar cataract is still unknown. However, it has been noted to occur as a result of gene mutation. Positive family history was found in 40–55% of the patients. It has been recognized that posterior polar cataracts seemed to follow an autosomal dominant inheritance pattern, although it is occasionally sporadic. Molecular genetic analyses have demonstrated that an autosomal-dominant posterior polar cataract is a genetically heterogeneous disease. The direct cause of the lenticular fiber malformation during lens development has not been well understood.

CLASSIFICATION

There are the following three classification systems:

Duke Elder Classification[8]

a. Stationary type
b. Progressive type

The stationary-type, which is more common (about 65%), is a well-circumscribed circular opacity localized on the central posterior capsule. The concentric thickened rings around the central plaque opacity give an appearance of a Bull's-eye. Sometimes, the opacity is camouflaged by nuclear sclerosis. Sometimes there is a smaller satellite rosette lesion adjacent to the central opacity. Progression may begin in any decade. In the progressive type, whitish opacification changes take place in the posterior cortex in the form of radiating rider opacity. It has feathery and scalloped edges but they do not involve the nucleus

Singh Classification

i. Type 1

The posterior polar opacity is associated with posterior sub-capsular cataract.

ii. Type 2

Sharply defined round or oval opacity with ringed appearance like an onion with or without grayish spots at the edge.

iii. Type 3

Sharply defined round or oval white opacity with dense white spots at the edge often associated with thin or absent posterior capsule. These dense white spots are a diagnostic sign (Daljit Singh sign) of posterior capsule leakage with or without repair and extreme fragility the incidence of this type in Indian adult cataract patient population was found to be about one in 300.

iv. Type 4

Combination of the above 3 types with nuclear sclerosis.

Schroeder Classification[9]

Schroederon the other hand graded posterior polar cataract in his pediatric patients according to its effect in pupillary obstruction in the red reflex testing as follows:

i. Grade 1

A small opacity without any effect on the optical quality of the clear part of the lens.

ii. Grade 2

A two-thirds obstruction without other effect.

iii. Grade 3

The disc-like opacity in the posterior capsule is surrounded by an area of further optical distortion. Only the dilated pupil shows a clear red reflex surrounding this zone.

iv. Grade 4

The opacity is totally occlusive; no sufficient red reflex is obtained by dilation of the pupil.

CLINICAL PRESENTATION AND DIAGNOSIS

The appearance of symptoms might be due to the vacuole

like changes in the vicinity of the central opacity. The typical symptoms are increasing glare while driving at night and difficulty in reading fine prints. Other symptoms include intolerance to light. The cause of glare, reduced contrast sensitivity, and decreased visual acuity is forward light scattering (light scattering toward the retina). The reasons for delayed presentation might be increasing density of the opacity, age-related pupillary miosis, or increased functional needs or visual expectations. If it is visually significant since childhood, it might present with strabismus indicating poor visual function in that eye.

The diagnosis of a posterior polar cataract is self-evident on slit-lamp examination and does not require special diagnostic procedures beyond a full ophthalmic examination. Slit-lamp examination and pupillary retro illumination allow a good evaluation of the visual significance of the opacity. When the posterior polar cataract is fully formed, it presents as a dense, circular plaque in the central posterior part of the lens giving rise to what was described by bull's-eye appearance (concentric rings around the central opacity).

PEDIATRIC POSTERIOR POLAR CATARACT

Posterior Polar Cataract has been identified in 7% of eyes of children undergoing congenital cataract surgery[10]. Unlike adult eyes, PPC occurs as unilateral cataract in a majority of paediatric eyes (93%). The preoperative diagnostic signs of a pre-existing posterior capsule defect in children include a well-demarcated defect with thick margins, chalky white spots in a cluster or a rough circle on the posterior capsule, and white dots in the anterior vitreous that move with the degenerated vitreous like a fish tail sign[11].

It is important to diagnose a posterior polar cataract and differentiate it from posterior subcapsular cataract. Posterior polar cataracts are generally more elevated, very well circumscribed, and associated with circumferential rings that delineate them from the surrounding capsule. Flatter varieties of posterior polar cataracts are generally characterized by plaque on the posterior capsule. These are not associated with the posterior capsule complications that commonly correlate with posterior polar cataracts[12]. Patients with congenital posterior polar cataracts have a long history of the condition, making the diagnosis more straightforward.

INCIDENCE OF POSTERIOR CAPSULAR RUPTURE (PCR)

The incidence of PCR in posterior polar cataracts varies from 36% to 6%[4,5,11,13]. It was suggested that the size of the polar opacity has a significant impact on the risk of PCR. Kumar S et al. found that 7 of 23 (30.43%) eyes with posterior polar opacities of 4 mm or more had PCR, whereas 2 of 35 eyes (5.71%) with posterior polar opacities of <4 mm had PCR14.

MANAGEMENT OF POSTERIOR POLAR CATARACT

The strategy is to delay cataract surgery as much as possible. Following are the possible indications of surgical intervention in a posterior polar cataract

1. Visual deterioration disturbing daily routine activities of the patient
2. Possibility of formation of posterior capsular defect in currently intact capsule
3. Development of advanced nuclear sclerosis
4. Progressing cortical opacity compromising the periodic evaluation of posterior polar cataract
5. Children in the amblyogenic age with posterior polar cataract

Preoperative counseling

It is important to inform the following possibilities to the patient

1. Posterior capsular rupture
2. Nucleus drop
3. Surgical aphakia; secondary lens implantation
4. Long operating time and delayed visual recovery
5. Need for Nd:YAG capsulotomy for residual plaque
6. Possibility of preexisting amblyopia, especially in cases of unilateral posterior polar cataract.

Because the understanding of posterior polar cataract, an autosomal dominant condition, is continually expanding, genetic counseling for the parents in addition to screening of family members is important[15].

Anesthesia

Local and topical anesthesia can be utilized for operating cases with posterior polar cataract. Vasavada and Singh preferred peribulbar anesthesia as it provides prolonged action and reduces positive vitreous pressure. This is in contrast to topical anesthesia, in which increased eye movement and lack of hypotony could increase the forward movement of the posterior capsule. Preoperative gentle ocular pressure can help to diminish the intraoperative posterior pressure.

Phacoemulsification

Coaxial phacoemulsification as well as bimanual microphacoemulsification technique can be used. Haripriya et al.[17] used bimanual microphacoemulsification technique with separate infusion and aspiration instruments placed through watertight incisions 1.4 mm in width.

The average fluid flow through the irrigating chopper is approximately 45–50 mL/ min compared to coaxial phacoemulsification, which has average irrigation of 90 mL/min when the bottle height is at 100 cm.

Besides having a controlled operating environment for slow motion phacoemulsification, the advantages of this technique lie primarily in the following: (1) allowing withdrawal of the phaco-needle first while maintaining the anterior chamber with infusion from the separate irrigating chopper, and (2) easing injection of viscoelastic into the anterior chamber before final withdrawal of the irrigating chopper.

Incision

One can start with a temporal clear corneal incision or a side port incision. Starting with the side port incision can avoid possible chamber collapse which

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might predispose to premature rupture of the capsule. It is important to ensure incision is neither too tight or one that is leaky, resulting in an unstable anterior chamber during the procedure.

Capsulorhexis

It is important to avoid overpressurizing the anterior chamber with viscoelastic material. This can increase the pressure in the anterior chamber and cause a blow-out of the posterior capsule. The optimal size of capsulorhexis is approximately ≤5mm. A rhexis size of <4mm could be detrimental in case the need arises to prolapse the nucleus into the anterior chamber. However, a larger opening may not provide adequate support for a sulcus-fixated IOL in case the posterior capsule is compromised.

Hydrodissection and hydrodelineation

Fine et al. did hydrodissection in multiple quadrants with tiny amount of fluid without allowing the wave to transmit across the posterior capsule[18]. Cortical cleaving hydrodissection is considered a contraindication in eyes with posterior polar cataract. A weak point can produce hydraulic posterior capsule rupture during hydrodissection.

Meanwhile, hydrodelineation, which is the separation between the nucleus and the epinucleus, is mandatory. In addition, nuclear rotation is contraindicated as it can act as a trephine to the posterior capsule. Vasavada and Raj described a technique that was described for dense and posterior polar cataract called insideout delineation. In this technique, a trench is first sculpted and a right-angled cannula is used to subsequently direct fluid perpendicularly to the lens fibers in the desired plane through one wall of the trench. This would avoid the possibility of inadvertent subcapsular injection and overcome the difficulty of introducing cannula to a significant depth in a dense cataract.

Division of nucleus and fragment removal

It was agreed in all studies that a slow motion phacoemulsification with low parameters should be used in cases with posterior polar cataract. The low vacuum and aspiration rates maintain a stable chamber and the low infusion parameters drive less fluid around the lens. Also the collapse of the anterior chamber and forward bulge of the PC is prevented throughout the procedure by injecting a viscoelastic before the instrument is withdrawn.

For grade 1 nuclear sclerosis, Vajpayee et al. prefer sculpting followed by sequential layer-by-layer aspiration using partial segmentation technique[19]. The wedge shaped cortical material is gradually aspirated till the central area of the posterior polar cataract (which may or may not have a preexisting defect) is reached. The cortical material is mechanically separated from the central plaque from approximately 3-4 mm outside the central area with the aid of a second instrument such as a chopper or a Sinskey hook. This maneuver avoids traction at the posterior pole, which may otherwise be generated from attempting to directly aspirate the cortical matter. The penultimate layer is carefully aspirated leaving the posterior plaque along with a thin layer of the cortex. The posterior plaque is then viscodissected and aspirated with the automated irrigation aspiration probe. The advantage of layer-by-layer phacoemulsification is the availability of an adequate cushion throughout the procedure, which is available during debulking of the nucleus. Further, the visibility of the plaque is enhanced as the subsequent layers are gradually peeled off by aspiration.

Lee and Lee sculpted the nucleus in the shape of the Greek letter lambda "λ technique", then cracking along both arms and removing the distal central piece[20]. The advantage of this is its gentleness in not stretching the capsule while removing the quadrants, especially the first one.

Salahuddin described a technique called "inverse horseshoe" in which after sculpting, he divides the distal end of the nucleus[21]. After that, viscoelastic is injected to lift up the two limbs of the nucleus forming a visco shell around the nucleus. The nucleus could be divided into two halves without causing undue stretching on the posterior capsule. Then, the two segments can be engaged, brought to the center, chopped, and emulsified separately.

Chee[22] devised a technique for hard posterior polar cataracts in which she cracks the nucleus in the periphery (partially) avoiding the posterior polar opacity and then chops it into quadrants without rotation. Then with the phaco tip she engages the core of the quadrant while cleaving along the lenticular lamellae, using the chopper to a depth that leaves a nuclear shell, sparing the polar cataract. Finally, the nucleus is peeled away from the outer nuclear shell, which is kept in place by the phaco chopper.

Removal of Epinucleus

Gentle hydrodissection/ viscodissection can help separation of epinuclear plate without subjecting the posterior capsule to undue stress. The separated epinuclear plate can be easily phacoaspirated.

Removal of Cortex

The usual pulling of the cortex should be minimized as possible. Instead, the aspiration tip should remain at the equatorial angle in the periphery, and the surgeon should wait until suction increases and the cortex is aspirated. Alternatively, the posterior chamber can be filled with viscoelastic material and cortex removed using a "dry" technique using simcoe cannula. It is important to remember to avoid polishing the capsule in such patients as it is usually very thin and may rupture to minimal trauma

Pseudohole

At times, the classic appearance suggestive of a defect may be observed in the posterior cortex when the posterior capsule actually remains intact. This phenomenon is known as a pseudohole.

Anterior Vitrectomy

If a defect is present in the posterior capsule, a dispersive viscoelastic is injected over the area of defect before withdrawing the phaco or I/A probe from the eye. Vasavada and Singh recommended two port vitrectomy with high cut rate, low vacuum and low flow rates. Vitrectomy can be safely performed even close to the torn capsule. The vitrector is never placed behind the peripheral posterior capsule. The infusion cannula is directed into the peripheral anterior chamber, and the fluid jet is directed towards the angle of the chamber, away from the defect. This reduces turbulence near the tip of the cutter and avoids enlarging the capsular tear. It also reduces hydration of the vitreous and forward movement of vitreous into the anterior chamber.

Intraocular lens (IOL) implantation

It depends on whether or not there is a capsular tear. If the posterior capsule is intact, a rigid or foldable intraocular lens can be inserted in the capsular bag. If there is a small posterior capsular rupture, a rigid or multipiece IOL can be implanted

into ciliary sulcus with or without optic capture into the rhexis margins. Cases in which there is a big rupture with questionable zonular integrity, it would be safer to implant an anterior chamber IOL, sclera fixated IOL or a retropupillary fixated iris claw lens. One should not hesitate to keep the patient aphakic if that is in the best interest of the patient.

Femtosecond Laser – assisted cataract surgery in posterior polar cataract.

The application of femtosecond lasers in cataract surgery allows creation of automated corneal incisions, anterior capsulotomy, and lens fragmentation23. Ultrashort-pulse femtosecond lasers operate at near infrared wavelengths and can be focused precisely at predetermined depths using advanced imaging technology to photodisrupt optically clear tissues while preventing collateral tissue damage[24]. The advantages of this technology over conventional phacoemulsification, including a more consistent capsulotomy and a significant reduction in phacoemulsification energy requirement[25-26].

Performing cataract surgery in patients with posterior polar cataract is technically demanding due to requirement of precise capsulorhexis, inability to perform hydrodissection and nucleus rotation. Femtosecond laser is used to perform precise capsulorhexis of required diameter and lens fragmentation. Femtosecond laser portion is performed in a separate room. Predefined surgeon templates are used for the selection of anterior capsulotomy and lens fragmentation patterns. The bed is then shifted, and the patient is prepared and draped as for phacoemulsification. The primary wound and paracentesis can be created manually or with the help of femtosecond laser. Further steps are performed as per conventional surgery.

There are emerging reports describing the safety and efficacy of femtosecond laser in patients with posterior polar cataract.

Abell R et al. [27] found a statistically significantly higher rate of anterior capsule tears in the femtosecond laser–assisted cataract surgery group. This could be attributable to anterior capsular tags, incomplete capsulotomy or initial learning curve of the surgeon. There was, however, no between group statistically significant difference in complications such as posterior capsule tear and dropped nucleus.

Alder B et al. found that hydrodelineation, which is easily performed during traditional phacoemulsification, might be more difficult after laser-based lens fragmentation. Furthermore, gas bubbles formed during laser application could become trapped behind lens material, placing extra tension on an already weakened posterior capsule. This could result in capsular distension syndrome (CBS), in which increasing pressure within the capsular bag results in posterior capsule rupture. CBS with posterior rupture attributable to gas distension and posterior gas escape can be visualized on the OCT images.

Titiyal JS et al. used a hybrid pattern of three cylinders and three chops for nucleotomy[28]. Block by block emulsification of prechopped nucleus was done from center outwards, with the remaining outer ring acting as protective cushion. Manual hydrodissection and hydrodelineation were avoided. They found that the technique of femtosecond laser – assisted cataract surgery was safe and effective for management of posterior polar cataracts, specifically for higher grades of nuclear sclerosis.

Femtosecond laser–assisted cataract surgery can be considered in cases of posterior polar cataract. At present, there is a need for surgical benchmarks with regard to femtosecond laser - assisted cataract surgery complications.

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Advances in Eye Banking – An Asian Perspective

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The cornea is the most commonly transplanted tissue worldwide, with an estimated 185,000 corneal transplants performed annually. Corneal blindness is a major cause of blindness in Asia. Asian eye banks frequently are unable to keep up with demand for corneas resulting in long corneal transplant waiting lists. Another problem with eye banks in Asia is the issue of inadequate high quality corneas and variable eye banking practices.

The Asia Cornea Society (ACS) was formed in 2007 and is a professional non-profit organisation of Asian corneal specialists. Professor Donald Tan is the elected president of the society which has its headquarters at the Singapore National Eye Centre (SNEC). ACS has spearheaded major clinical, educational and research projects to alleviate corneal blindness in Asia.

To manage the issue with Asian eye banks, ACS formed the Association of Eye Banks of Asia (AEBA), with representation of major eye banks in Asia. AEBA is introducing a preliminary Asian medical standard for eye banking practices and also started the concept of model eye banks in Asia. In collaboration with AEBA, the Singapore Eye Bank (SEB) under the directorship of Professor Donald Tan, established a new model eye bank in Colombo, Sri Lanka, in collaboration with the Sri Lankan health ministry. The National Eye Bank of Sri Lanka (NEBSL) was formed in February 2011. At present, besides fulfilling the demand for corneas within Sri Lanka, NEBSL is also exporting corneas to other countries throughout Asia and SEB and NEBSL are currently working in partnership to organize the export of corneas to Asian countries in dire need of corneas. The Singapore Eye Bank also offers precut services for donor corneas for Endothelial Keratoplasty.

Figure 1: *The Singapore Eye Bank adopts and modifies EBAA (Eye bank Association of America) and international standards and standard operating protocols to local and regional needs. Elevated to Centre for Excellence for eye banking training: Lee Kong Chian International Centre for Excellence in Cornea, Eye banking and Eye Diseases – EXCEED.*

The Association of Eye Banks of Asia (AEBA) and the Singapore Eye Bank will continue to play a significant role in alleviating corneal blindness in Asia.

Financial Interest: *The author does not have any financial interest in any procedure/product mentioned in this manuscript.*

Ocular Tumours Associated with Systemic Disease

Sima Das, Arpan Gandhi

Several of ocular tumors can be manifestation of a systemic disease and ophthalmologists treating ocular tumors need to be aware of these associations and initiate appropriate systemic and genetic workup for the same. This article enumerates some of the common ocular tumors associated with systemic disease and describes the indications and details of systemic evaluation to be done whenever such these tumors are diagnosed. Other than various syndromes which has genetic basis, acquired systemic diseases like HIV-AIDS infection can also be associated with various ocular tumors.

EYELID TUMOURS ASSOCIATED WITH SYSTEMIC ASSOCIATION

SEBACEOUS ADENOMA

Sebaceous adenoma are rare benign neoplasms of the sebaceous glands. These tumors can be seen anywhere in the body, however they have a predilection for the eyelids due to the abundance of sebaceous glands in the eyelid tissue. They usually appear as small, well circumscribed yellowish nodules. The surface can be papillary at times and usually there is absence of ulceration or crusting. In the eyelid these arise in association with the gland of Zeiss or the Meibomian glands and can be seen at the lid margin. Histopathologically, these tumors show benign, multinodular lobules with sebaceous differentiation. The cells show closely vacuolated cytoplasm and starry nuclei. Sebaceous adenoma especially if multiple can be associated with Muir-Torre syndrome[1-3].

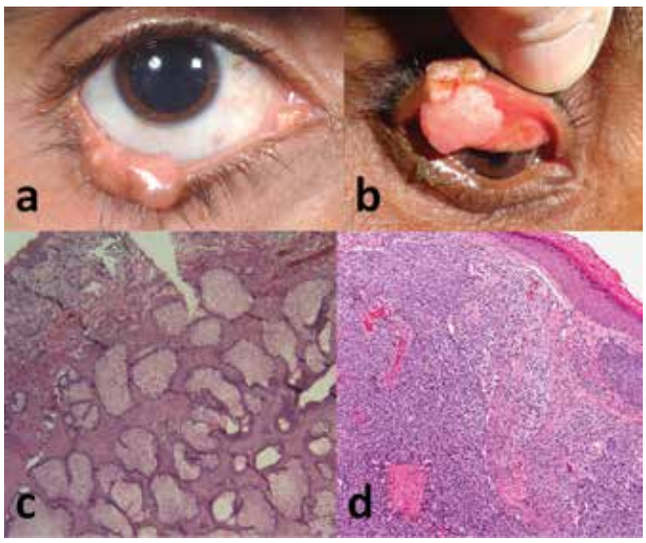

Figure 1: *Sebaceous gland adenoma appearing as multinodular swelling at lid margin(1a), note the cystic spaces within the lesion which is seen in sebaceous adenomas associated with Muir-Torre syndrome. Sebaceous gland carcinoma is rarely associated with this syndrome(1b). Histopathological appearance of sebaceous adenoma(1c) and sebaceous gland carcinoma(1d).*

Systemic association

Muir-Torre syndrome

Muir-Torre syndrome is a multisystem disorder characterised by the presence of multiple cutaneous sebaceous neoplasms associated with internal malignancy. Sebaceous adenoma is the most common sebaceous neoplasm associated with Muir Torre syndrome, however there are reports of sebaceous gland carcinoma also associated with Muir-Torre syndrome[4]. Colorectal and genitourinary malignancies are the most common internal malignancy reported in Muir-Torre syndrome although other malignancies has also been reported. This is an autosomal dominant disorder and the affected family members developing colorectal carcinoma can get it at an earlier age. The colorectal carcinoma is seen in about half of the patients of Muir-Torre syndrome and about one fourth of the patients can get genitourinary malignancy. The colorectal carcinoma associated with Muir-Torre syndrome tends to be multifocal unlike the sporadic cases.

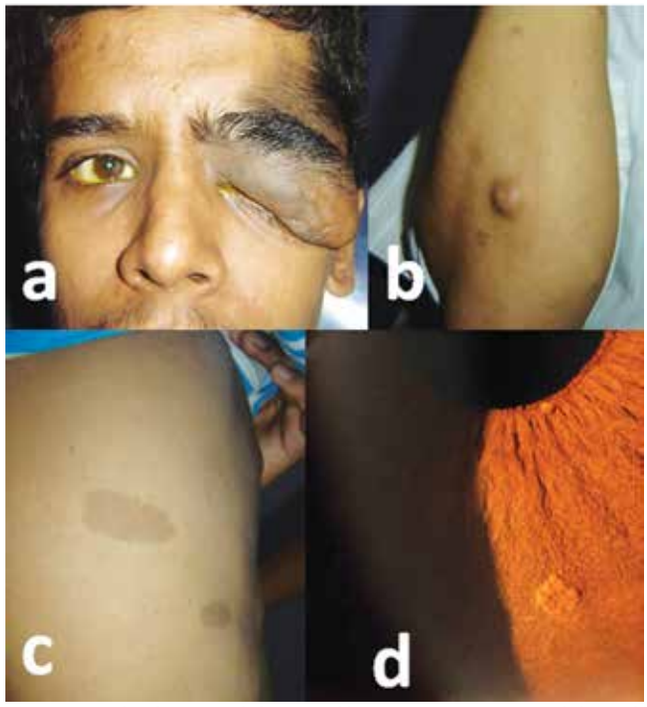

Figure 2: *Plexiform eyelid Neurofibroma in a young adult with Neurofibromatosis Type 1(2a). Note the nodular neurofibroma on the forearm(2b), cafe-au-lait spots(2c) and the iris Lisch nodules(2d) in this patient.*

Figure 3: *Pre auricular skin tags and epibulbar choristoma in a patient with Goldenhar syndrome.*

Figure 4: *Linear nevus sebaceous syndrome. Note the linear cutaneous nevus(4a) and epibulbar complex choristoma along with linear patch of scalp alopecia in achild with this syndrome(4b).*

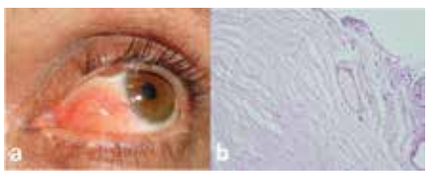

Figure 5: *Conjunctival myxoma in adult appearing as pink fleshy subconjunctival nodule(5a). Histopathology showing loose stroma with abundant ground substance.*

Almost half of the patients with Muir Torre syndrome can develop sebaceous neoplasms prior to the diagnosis of internal malignancies. Presence of isolated sebaceous gland carcinoma or sebaceous adenoma as such is not diagnostic of Muir -Torre syndrome and not all eyelid sebaceous gland adenoma or carcinoma needs to be screened for internal malignancies. Cystic changes or keratoacanthoma like features within a sebaceous adenoma are characteristic finding in Muir -Torre syndrome (Figure 1). Also, the genetic defect in Muir-Torre syndrome is a germline mutation in the gene encoding the DNA mismatch repair protein mutL homologue 1(MLH1) and mutS homologe 2 (MSH2). Hence, once a diagnosis of sebaceous adenoma is made on histopathology, immunohistochemistry can be done with antibodies against MLH1 and MHS2. A negative immunoreactivity within the tumour cells is suggestive of a mutation in the gene. These patients need to be screened further for internal malignancies and other associations of Muir -Torre syndrome.

BASAL CELL CARCINOMA

Basal cell carcinoma is one of the common malignant eyelid tumour. It is a slow growing tumor with different morphological variants like nodular, noduloulcerative, cystic and morpheaform. Usually, the tumour appears as a solitary eyelid growth, however patients with Basal cell nevus syndrome (Gorlin-Goltz syndrome) can have multiple or recurrent basal cell carcinoma[5].

Figure 6: *Bilateral OSSN in a patient with Xeroderma pigmentosum(6a) and right lower eyelid basal cell carcinoma in a Xeroderma pigmentosum patient(6b). Note the typical skin freckling in both patients.*

Systemic association

Basal cell Nevus syndrome

Basal cell nevus syndrome or Gorlin Gotz syndrome is an autosomal dominant disorder characterised by multiple basal cell carcinoma and several other developmental anomalies. Mutation in the PTCH gene located in chromosome 9q22.3 is responsible for the various manifestations of this disorder. Ocular manifestations include multiple eyelid basal cell carcinoma, nystagmus, microphthalmia, cataract and vitreoretinal abnormalities.

The most common finding in basal cell nevus syndrome is the development of basal cell carcinoma in adolescence or young adulthood. Basal cell nevus syndrome is also associated development of other cancers early in life, including medulloblastoma (a malignant brain tumor, usually in children, breast cancer, non-Hodgkin's lymphoma (NHL) and ovarian cancer. Other common systemic features include odontogenic cysts, and calcification of the falx cerebri. Multiple basal cell carcinoma especially in young patients (<20 years) needs to be tested for the genetic mutation to rule out Basal cell nevus syndrome.

EYELID NEUROFIBROMA

Neurofibroma of the eyelid can present as solitary nodular swelling or as a plexiform neurofibroma. Neurofibromas are the hallmark of Neurofibromatosis type 1 (NF1) which is an autosomal dominant condition (Figure 2).

The neurofibromas can be single or multiple and can be present throughout the body, However they are not present at birth and usually appears by the end of first decade. Plexiform eyelid neurofibroma is one of the clinical diagnostic criteria of NF1[6]. Surgical excision and debulking remains the mainstay of treatment of eyelid neurofibroma with an high rate of regrowth of the lesions.

CONJUNCTIVAL TUMORS ASSOCIATED WITH SYSTEMIC DISEASE

Tumors of the conjunctiva has a variety of systemic associations and it is important to be aware of these conditions so that timely diagnosis could be made and appropriate treatment initiated.

EPIBULBAR CHORISTOMA

Epibulbar choristomas are the most common epibulbar tumour, especially in children. They can be categorised as simple or complex choristoma depending on the type of tissue which is present within the lesion. Epibulbar dermoid which is usually located at the limbus and dermolipoma which is situated subconjunctivally usually ay the superotemporal quadrant are the most common types of epibulbar choristoma. Epibulbar choristomas are one of the diagnostic features of Goldenhar syndrome and is also associated with Linear nevus sebaceous syndrome (Nevus sebaceous of Jadahson).

Systemic association

(i) Goldenhar syndrome

Goldenhar syndrome also known as oculoauriculovertebral dysplasia involves developmental anomalies of the first and the second brachial arches[7,8]. Usually occurs as a sporadic condition and consists of triad of epibulbar choristoma, preauricular skin tags and pretragal fistulae (Figure 3). Associated conjunctival tumours are limbal dermoids and dermolipoma which appear as yellowish subconjunctival mass commonly at the lateral or superolateral fornix. Other ocular associations include eyelid coloboma, Duane's retraction syndrome, microphthalmia. Systemic involvements are vertebral anomalies, cardiac defect, and facial hypoplasia.

(ii) Nevus sebaceus syndrome (of Jadassohn)

This is a neurocutaneous disorder which occurs sporadically and is characterised by cutaneous sebaceous nevus and non cutaneous manifestations[9].

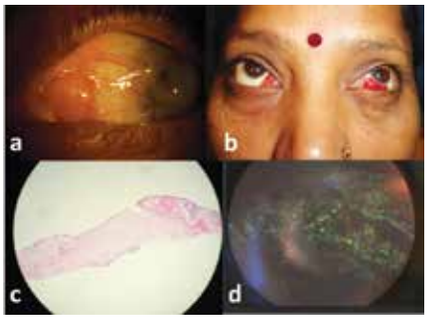

Figure 7: *Conjunctival amyloidosis presenting as yellowish-pink waxy conjunctival nodule (7a). Bilateral conjunctival hemorrhage presenting as spontaneous subconjunctival hemorrhage in left eye (7b). Histopathology showing the deposition of amorphous eosinophilic material (7c) and polirised microscopy showing the characteristic Apple green birefringence (7d).*

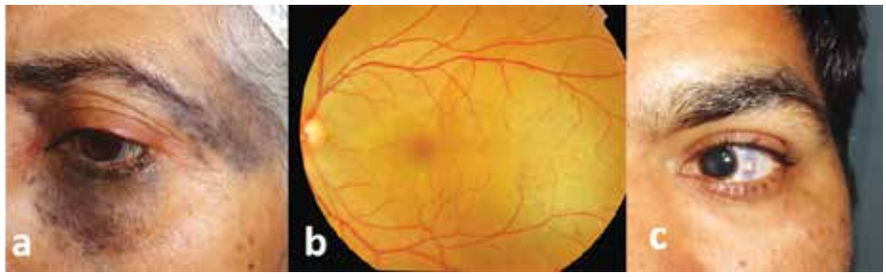

Figure 8: *Cutaneous and episcleral pigmentation in a female patient with Oculodermal melanocytosis.(8a)The hairline pigmentation can be associated with meningeal melanocytosis. Uveal malignant melanoma involving the posterior pole of left eye in an young adult (8b). Ipsilateral episcleral and upper eyelid pigmentation in the same patient suggestive of Oculodermal melanocytosis(8c).*

The characteristic cutaneous findings are the sebaceous nevus which are epidermal nevus with adnexal components. In childhood, they appear clinically as linear atrophic skin lesion or as patches of skin hyperpigmentation or alopecia on the scalp which becomes hypertrophied in older age (Figure 4). The skin lesions can undergo malignant transformation with age and hence are best excised[10]. Ocular manifestations are found in about 40% of the cases and include epibulbar choristomas, mostly complex choristoma, eyelid colobomas, ptosis, optic disc anomalies like morning glory disc, intrascleral calcification[11,12]. Systemic anomalies include cerebral hypoplasia, mental retardation, seizures, genitourinary and cardiovascular anomalies.

CONJUNCTIVAL MYXOMA

Conjunctival myxoma are benign stromal tumors of the conjunctiva which appear as pale fleshy bulbar conjunctival lesion[13] (Figure 5). Surgical excision is the treatment of choice and on histopathology it appears as an hypocellular tumors with stellate or spindle cells with abundant mucoid material in the stroma.

Systemic association

Carney complex

Conjunctival or eyelid myxoma can be associated with Carney complex which consist of cutaneous pigmentary anomalies, myxomas, endocrines anomalies and schwannomas[14]. Since cardiac myxomas can cause emboli formation and can be life threatening it is important to screen patients for any cardiac anomalies with echocardiography whenever a diagnosis of conjunctival or eyelid myxoma is made. However, patients who have a positive family history or associated mucocutaneous pigmentation needs detailed workup including hormonal assays and genetic studies to rule out this condition.

OCULAR SURFACE SQUAMOUS NEOPLASIA

Ocular surface squamous neoplasia(OSSN) include a spectrum of cancerous and precancerous lesions of the conjunctiva and the cornea. OSSN can be of various morphological variants and surgical excision remains the primary treatment modality in most cases.

OSSN has been associated with systemic immunodeficiency conditions like HIV infection as well in patients on systemic immunosuppressant like renal transplant patients. Inherited condition like xeroderma pigmentosum is also associated with OOSN formation.

(i) Xeroderma pigmentosusm

Xeroderma pigmentosum is an autosomal recessive condition The genetic defect involves mutation in the gene involved in nucleotide excision repair. The hallmark of this condition is the cutaneous abnormalities of extreme photosensitivity and sunburn which starts early in childhoods giving rise to the characteristic freckling of the skin[15]. The skins lesions can ultimately develop into multiple cutaneous malignancies like multiple and recurrent basal cell carcinoma, melanoma or squamous cell carcinoma which can be the cause of death in these patients16. Sun protection starting early childhood remains the mainstay of treatment in these patients. Other neurological deficits like ataxia and absence of deep tendon reflexes can also be associated.

OSSN is the prominent ophthalmic finding in Xeroderma patients (Figure 6). The tumors usually occur at young

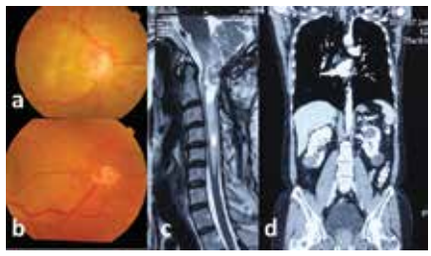

Figure 9: *Bilateral retinal capillary hemangioma (9a and 9b) in a 35 year old male patient with Von –Hippel Lindau disease. Note the presence of hemangioblastoma of the spinal cord (9c) and renal cortical cyst(9d).*

age, can be bilateral and tend to recur after excision. The tumors are usually located in the sunexposed interpalpebral area or on the cornea. Other conjunctival and corneal findings like atrophy and pigmentation, vascularisation of the cornea, pterygium formation are also frequently seen. Several eyelid malignancies like basal cell carcinoma or melanoma can develop frequently.

(ii) Papillon Lefevre syndrome

Papillon Lefevre syndrome is a rare disorder characterised by palmo-plantar keratoses and periodontosis. Palmo-plantar keratosis is characterised by well demarcated, erythematous, hyperkeratotic lesions on the palms, sole and dorsum of the feet. This condition can be associated with the presence of melanoma and cutaneous and conjunctival squamous cell carcinoma and should be looked for in young patients with OSSN with no other predisposing factors[17]. The OSSN tends to be more aggressive in these patients with chances of distance metastasis.

(iii) OSSN associated with immunodeficiency

OSSN has been associated with HIV-AIDS infection as well as in patients with systemic immunosupression like renal transplant patients. HIV-AIDS is associated with eight fold increased

risk of OSSN formation and all patients of OSSN should be screened for this condition[18]. The OSSN tends to be more aggressive, can be bilateral and can be pigmented in these patients. Cases of OSSN in renal transplant patients has also been reported.

Other ocular tumors reported with HIV infection include eyelid Kaposi sarcoma and molluscum lesions. Molluscum lesions can be multiple or can be giant molluscum (>1mm) and are considered one of the sentinel signs for low CD4 count.

OCULAR AMYLOIDOSIS AND SYSTEMIC ASSOCIATION

Conjunctival amylodosis appear as pale pink waxy lesions of the conjunctiva which can be localised or diffuse (Figure 7). This lesion tends to bleed spontaneously and should be ruled out in patients with history of spontaneous, recurrent subconjunctival haemorrhage[19]. Bilateral involvement can be associated with systemic amyloidosis and needs to be investigated to rule out multiple myeloma or familial amyloidosis. Other ocular structures like eyelid and orbit can also have amyloid deposits. Vitreous deposit of amyloid appears as greyish, cobweb like opacities and can be attached to the posterior lens surface. Vitreous amyloidosis is associated with familial amyloidotic polyneuropathy due to mutation in the transthyretin gene[20].

CONJUNCTIVAL NEUROMA

Conjunctival neuromas appear as intraconjunctival worm like thickening. There can be associated eyelid nodular neuromas or diffuse eyelid thickening. Conjunctival and eyelid neuromas along with prominent corneal nerves can be associated with Multiple Endocrine neoplasia Type 2B (MEN 2B). Prominent corneal nerves are seen in almost 90% of patients with MEN 2B and should be ruled out in patients with no other causes for prominent corneal nerves[21].

Multiple Endocrine neoplasia 2B

MEN are a group of genetic disorders characterised by the development of benign and malignant tumors of the various endocrine glands of the body. MEN 2B is characterised by the development of mucosal neuromas along with medullary thyroid carcinoma. It is important to rule out this association in patients with conjunctival neuroma or prominent corneal nerves as the thyroid carcinoma is aggressive and prophylactic thyroidectomy may be indicated in these patients[22].

INTRAOCULAR TUMORS ASSOCIATED WITH SYSTEMIC DISEASE

Uveal melanoma

Uveal melanoma is the most common malignant intraocular tumor in adults.It is usually seen in the elderly individual and most tumors arise from the choroid. Uveal melanoma can rarely be seen in young individuals, mainly in association with Oculodermal melanocytoses(Nevus of ota) or as part of Familial atypical mole melanoma syndrome (FAM-M).

Oculodermal melanocytosis

This is a congenital disorder characterised by hyperpigmentation of the skin and the ocular structures like episclera, uvea, orbit as well as ipsilateral meningeal hyperpigmentation. These patients have increased risk of development of ipsilateral uveal melanoma (1 in 400) and about 1 in 9 cases of uveal melanoma in young will have this condition[23]. Hence, these patients need yearly ophthalmic evaluation including a dilated fundus evaluation. Cutaneous pigmentation along the hairline maybe associated with meningeal melanocytosis and an increased risk of development of meningeal melanoma (Figure 8).

Familial atypical mole melanoma syndrome

This is an autosomal dominant condition characterised by the presence of multiple atypical cutaneous nevi which displays characteristic findings on histopathology as well as the presence of cutaneous melanoma in first or second degree relative. An increased incidence of uveal melanoma has been found in patients with familial atypical mole melanoma syndrome as the uveal melanocytes are similar in embryology and morphology to the cutaneous melanocytes[24].

Diffuse choroidal hemangioma

It appears as orange coloured lesion on fundal evaluation and can be associated with exudative retinal detachment. Diffuse thickening of the choroid is the characteristic finding on ultrasonography. Diffuse choroidal hemangioma is usually seen in patients with Sturge Weber syndrome and is usually ipsilateral to the side of the facial hemangioma.

Sturge –Weber syndrome

Sturge –Weber syndrome (SWS) is a neurocutaneous disorder and has a triad of choroidal hemangioma, cutaneous hemangioma and leptomeningeal hemangioma. Leptomeningeal involvement can give rise to seizures and developmental delay in children. Cutaneous hemangioma, also known as Port wine stain can be unilateral or bilateral and is mainly a cosmetic concern. Glaucoma is the most common ocular association and is present in about 70% of patients25. Diffuse choroidal hemangioma is seen in about 50% patients with SWS and requires treatment only if causing exudative retinal detachment involving the macular area.

Pigmented Ocular fundal lesions

Congenital grouped pigmented lesions of the retina can be associated with Gardner syndrome or familial adnomatous polyposis. These retinal lesions are different from the congenital hypertrophy of the retinal pigment epithelium as there is diffuse abnormalities of the retinal pigment epithelium (RPE) in these patients in addition to the focal pigmented lesions. Ophthalmolscopically the fundal lesions appear as ovoid or tear drop

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shaped lesions in the posterior pole with or without a depigmented halo or pigmented tail. In addition there can be diffuse peripheral RPE stippling.

Gardner syndrome

Gardner syndrome or Familial adenomatous polyposis is an autosomal dominant condition characterised by the development of multiple colonic polyp which subsequently develops into adenocarcinoma of the colon[26]. Prophylactic colonectomy might be indicated in these patients for the same. Other extracolonic cancers like thyroid, adrenal and liver cancer are also associated with this syndrome. Presence of 4 or more of these atypical pigmented fundal lesions is highly sensitive and specific clinical marker for Familial adenomatous polyposis and needs screening of the patients as well as first degree relatives with colonoscopy[27].

Retinal Capillary hemangioma

Retinal capillary hemangioma are circumscribed red-orange retinal vascular lesions which can be unilateral or bilateral. They have prominent feeder vessels and can cause exudative retinal detachment or retinal traction. Retinal capillary hemangioma is the most common finding in Von-Hippel Lindau disease (VHL).

Von-Hippel Lindau disease:

This is an autosomal dominant condition with multisystem involvement, specifically the brain, eye and the viscera[28]. Presence of two or more retinal capillary hemangioma or presence of a single retinal capillary hemangioma with a positive family history of other lesions like retinal capillary hemangioma, central nervous system (CNS) hemangioma or a visceral lesion like renal cell carcinoma, renal cortical cyst, pheochromocytoma etc. is diagnostic of Von-Hippel Lindau disease (Figure 9). Half of the patients of VHL disease have CNS hemangioma and less than 50% can develop renal cell carcinoma which can be the cause of mortality in these patients. The various clinical manifestations are age dependent which as depicted and the cumulative probability of retinal manifestations, CNS hemangioma and renal cell carcinoma increases with age. Hence, the screening strategy also needs to be modified according to the age of the patient.

ORBITAL TUMORS WITH SYSTEMIC ASSOCIATION

Optic nerve glioma and Neurofibromatosis Type 1 (NF1)

Optic pathway gliomas are benign tumors which constitute about 2 to 4 % of all orbital tumors. Glioma can be isolated to the optic nerve in one fourth of the cases whereas in three-fourth patients the optic chiasma is also involved. Optic pathway gliomas can be associated with NF1 and about 30% patients of optic gliomas have NF1. Conversely, 15-40% of NF1 patients can have optic pathway gliomas. The glioma associated with NF1 tends to be slowly progressive, can be bilateral and can present at a later age group. Bilateral optic gliomas are almost pathognomic of NF1.Hence regular follow up and neuroimaging is indicated in patients with NF1 to detect optic glioma.

Other ocular tumors associated with NF1 include solitary or plexiform neurofibroma of the eyelid or orbit. Since both the neural cells involved in NF1 and melanocytes are of neural crest origin, neurofibromatosis can also be associated with uveal melanoma.Retinal astrocytic hamartoma, choroidal hemartoma and combined hamartoma of the retina and retinal pigment epithelium can also be associated with NF.

CONCLUSION

Ocular tumors can a have a variety of syndromic or non syndromic systemic associations. Ophthalmologists treating these tumors should be aware of the various associations and advice appropriate clinical and diagnostic evaluation to detect them. Some of the systemic associations can be life threatening and needs prompt detection and appropriate referral.

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Sebaceous Gland Carcinoma In Recurrent Upperlid Mass

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Eyelids are one of the primary natural protective mechanisms for the ocular structures. It executes various inherent functions like protection from external environment by active blink mechanism, lacrimal pump function for tear drainage and tear film maintenance for healthy ocular surface. It also harbors physiologically vital glands and appendages for the routine ocular surface stability. Anatomically, it has been divided into the anterior lamellae comprising of skin and muscle and the posterior lamellae which include the tarsus and the conjunctiva[1]. Because of its versatile histological nature, it can be affected by varied pathological conditions involving the separate microstructures hidden in it. Tumours or neoplasms are one such condition which can originate de novo from the lids[2]. In this section, I would like to highlight the need for biopsy in recurrent lid masses which may at times be dreaded malignancies like sebaceous gland carcinoma (SGC).

CASE 1

A 65 years old female patient presented to us with h/o swelling in medial aspect of upper lid for 2 months. She gave h/o previous incision and curettage done for similar swelling in the same place elsewhere. There were no other ocular complaints. On examination there was nodular mass in the upper lid medial aspect measuring 4x4mm on the cutaneous side and 6x5mm on the tarsal side (Figure 1). There was minimal loss of eye lashes and thickened skin. The mass was firm and adherent to underlying tarsus. Slit lamp examination and fundus was normal. Her systemic examination showed no abnormality. She underwent mass excision with 3mm clearance with direct closure. The immediate postoperative period was uneventful and the histopathological evaluation reported as meibomian gland or sebaceous gland carcinoma (SGC).

CASE 2

A 69 years old female patient with history of long standing swelling in upper lid came to our OPD. There was history of previous surgery and drooping of upper eyelid of the same eye since last 1 month with obstruction in visual acuity. On examination there was firm indurated mass on the upperlid encroaching the entire middle 1/3 of the lid with bosselated surface with yellowish elevations (Figure 2). Slit lamp examination showed a cataractous lens and the dilated fundus appeared normal. Clinical diagnosis of SGC was made and the surgery was performed. Local resection with 3mm clearance with map biopsy was performed with direct lid closure with lateral cantholysis.

CASE 3

A 45 years old man came with history of mass in the upper lid with previous history of excision and recurrence in the same region. On examination, there was prominent mass on the upper lid in the middle 1/3 with inner cheesy white elevated appearance (Figure 3). It was firm and had indurated the surrounding region. No systemic history was positive and there were no other ocular complaints. Slit lamp examination showed normal cornea, lens and fundus. The patient underwent excision biopsy with 3mm clearance with map biopsy of the surrounding region. Lid reconstruction was performed by direct closure. The histopathology confirmed to be SCG. The map biopsies turned to be negative for malignant spread in the surrounding tarsus.

DISCUSSION

Sebaceous cell carcinoma (SGC) is a malignant tumour that originates from the meibomian glands or modified sebaceous glands of the eyelid[3]. This is regarded as the second most common tumour of the eyelid only after basal cell carcinoma. It is common in elderly population and has slight female preponderance. SGC is two to three times more common in upper eyelid due to more number of meibomian glands there. There are few differences in the presentation of SGC as it may mimic a chronic blepharoconjuntivitis or chalazion[4-6]. SGC growth in three patterns, namely the nodular, the spreading and the pagetoid. The nodular type is often visible on the skin as elevation or tarsoconjunctival mass. Therefore any chronic chalazion or recurrent chalazion should preferably undergo histopathological evaluation of the specimen. However, the spreading type will have diffuse spread with thickening of lid, or loss of eyelashes. SGC is often multifocal and can show extension of the tumour within the epithelium called " the pagetoid type" unlike squamous or basal cell carcinoma[7]. Prior to surgical excision, it is important to examine the patient carefully for evidence of pagetoid spread or multicentric origin by double eversion of the eyelids, and any conjunctival alteration such as telangiectasia, papillary change or a mass.

Surgical management ranges from the local excision to the radical excision with or without exenteration depending on the stage at presentation. Frozen section biopsy or Moh's micrographic surgery is the best method to confirm the clearance of the margins[8]. Conjunctival punch or map biopsies should be taken in addition to surgical resection of the lid lesion[9]. It has been reported 30% of mass recur in SGC after excision[10]. when the margin in histopathology shows positive for tumour, it is necessary to go back and take the involved margin to get better clearance. Advanced stages of SGC will

Figure 1: *Preoperative (A,B) and postoperative (C) picture of patient 1 with upper lid mass lesion which was confirmed as sebaceous gland carcinoma (D).*

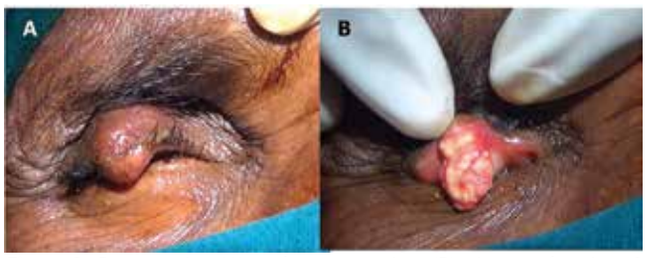

Figure 2: *Preoperative (A) and postoperative, (B) picture of patient 2 with upper lid mass presenting as mechanical ptosis*

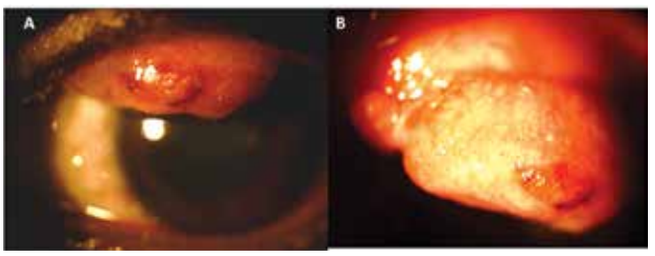

Figure 3: *Preoperative (A) and postoperative (B) picture of patient 3 with upper lid lesion recurrence after primary excision*

require extensive surgeries like the radical excision of lids, the neck node dissection if regional nodes are involved, the exenteration in orbital involvement and the radiotherapy. Radiation is mainly reserved for patients who are not candidates for surgical procedures due to advanced age or disease, for palliation in widespread disease, and for patients who refuse exenteration for advanced local disease. Preoperative magnetic resonance tomography will help in confirming the extent in those patients with the whole lid, the orbit or the bone infiltration.

Histopathologically, the tumour is represented by vaculated cytoplasm which is pale and foamy with hyperchromatic nuclei and cells staining positive for Oil red O stain[11]. In molecular basis, expression of p53 is considered for SGC to diagnose dysplasia or invasive carcinoma. Ultra structural features of SGC include desmosomes, tonofilaments and intracytoplasmic nonmembrane bound lipids. The prognosis depends on the size of lesion (lesions less than 6mm favour well, lesions more than 10mm show worse prognosis), the extension to surrounding structures like orbit (orbital or infiltration of blood vessels or lymphatics have poor prognosis), the type (pagetoid or multicentric mass has poor prognosis), the duration (lesion more than 6 months have poor prognosis), the origin (SGC from Zeiss show better prognosis) and the histopathological differentiation. Because of frequent difficulties and delay in the diagnosis and treatment, mortality rate in SGC ranges from 5 to 10%. Nevertheless early diagnosis, astute clinical suspicion and accurate histopathological diagnosis, together with radical and aggressive surgical approaches has shown to reduce the mortality to 3%[12]. All the above cases show the necessity for biopsy in any recurrent masses in eyelids. SGC is a great mimicker of blepharitis or chalazion, hence suspicion is utmost important in dealing such cases.

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Tissue Addition in Refractive Surgery- A New Paradigm!

Sri Ganesh, Sheetal Brar

Since small incision lenticule extraction (SMILE) became clinically available in 2011, the procedure has turned into a compelling LASIK alternative for refractive surgeons. SMILE's biggest attraction to surgeons and patients alike can be attributed to the fact that it addresses certain postoperative issues related to laser-assisted in situ keratomileusis (LASIK) such as flap related complications, post-operative dry eye , minimal restrictions after surgery and probably better biomechanical stability.

Today, according to recent data from Carl Zeiss Meditec (Jena, Germany), SMILE is being regularly performed by more than 700 surgeons, and there are more than 700,000 SMILE procedures already performed worldwide.

With this many procedures, what could refractive surgeons do with all those extracted lenticules?

Since small incision lenticule extraction (SMILE) became clinically available in 2011, the procedure has turned into a compelling LASIK alternative for refractive surgeons. SMILE's biggest attraction to surgeons and patients alike can be attributed to the fact that it addresses certain postoperative issues related to laser-assisted in situ keratomileusis (LASIK)

TISSUE ADDITION TECHNIQUES IN REFRACTIVE SURGERY

With the increasing number of eyes undergoing ReLEx SMILE for myopia, and thus, the extracted lenticules as a by-product, it may be a novel idea to preserve these lenticules on a long-term basis using cryopreservation for potential future use and research.

Recently, we reported our findings on the potential use of cryopreserved corneal lenticules in humans , a novel application of SMILE-extracted lenticules[1]. Lenticules from myopic patients undergoing ReLEx SMILE at our center were cryopreserved for use in heterologous individuals to treat hyperopia and keratoconus using a tissue addition technique called femtosecond laser intrastromal lenticular implantation (FILI).

For treating hyperopia, VisuMax femtosecond laser system (Carl Zeiss Meditec) was used to create a 7.5 mm diameter pocket at a depth of 160 mm and with a 4 mm superior incision. A depth of 160 mm was chosen for implantation in all patients due to uncertainty in refractive outcomes, the novelty of the nomograms, and to have adequate tissue in the cap for later enhancement with surface ablation if required. A cryopreserved lenticule obtained from a SMILE donor, matched for refractive error and corrected for back vertex distance, was used for implantation. Post-operatively, patients were prescribed topical steroids in tapering dosage for a period of 6 months along with lubricants.

In our experience with 30 eyes of moderate to high hyperopia (mean spherical equivalent +5.25 D, range +3.5 to +9.00 D) with a mean follow up of 24 months, we found improvement in both uncorrected and best corrected visual acuity and fairly good accuracy of correction. All patients were within +1D of Spherical Equivalent (SE) of correction (Figure 1) shows changes in topography following implantation of a -4.5 D lenticule in a 24 year old patient for +4.5 D of hyperopia. Post-operatively a diffuse steepening can be observed with increase in mean keratometry from 42.3 D to 44.5D. The lenticule remained clear until the last follow-up and did not show any shift with time (Figure 2). At the end of 24 months, all eyes had clear and well centered lenticules with stable refraction. However, 2 eyes of one patient presented with diffuse interface opacities after stopping topical steroids at the end of 6 months, which was presumed as stromal rejection. In view of the drop in BCVA, both lenticules were explanted and replaced by fresh tissues in the same sitting. Following reimplantation, patient did well post-operatively and the lenticules remained clear until 12 months.

For potential treatment of keratoconus[2], in mild to moderate cases (Kmax <58 D, no apical scarring), a modified surgical technique was used. Instead of implanting the whole lenticule, the central 3 mm of the lenticule was punched with a corneal trephine, thus creating a doughnut shaped tisssue. This doughnut lenticule was then implanted into a pocket created

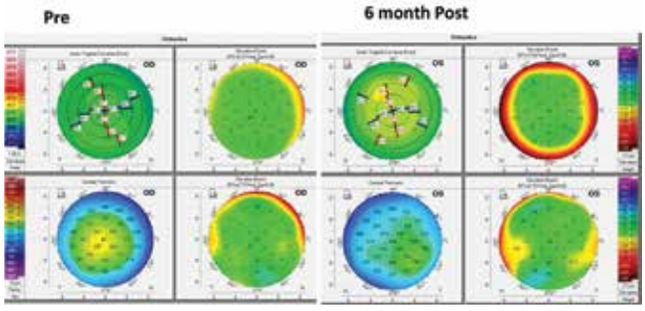

Figure 1: *Keratometry changes after FILI for +4.25D in the RE of a 24 year old patient. Note Mean keratometry increase from 42.3 to 44.5 D and mean pachymetry increase from 530 to 620µ.*

at 100 microns depth into the cornea with a femtosecond laser and centered at the visual axis(First Purkinje image). This was followed by accelerated cross linking(KXL) using the Avedro KXL system, wherein 0.25% riboflavin dye (Vibex Xtra, Avedro, Waltham) was injected into the corneal pocket and allowed to soak for 1 minute, followed by ultraviolet radiation exposure at 30 mW/cm2 for 3.3 minutes, thus delivering a total energy of 6.3 J to the cornea.

In our experience of treating 9 eyes with mild to moderate keratoconus, with mean follow up of 12 months, we observed a significant improvement in uncorrected visual acuity (UCVA) and best spectacle corrected visual acuity (BSCVA) with reduction in mean keratometery , asphericity (Q-Value), and total higher order aberrations (HOA). No eye developed haze or infection in the long term follow-up. Biomechanical changes studied with Corvis ST, also indicated improvement in stiffness of cornea post-operatively suggesting that tissue addition in combination with accelerated cross linking may be a valid and acceptable modality for surgical management of keratoconus (Figure 3). shows the topography changes following FILI +KXL for a 26 year patient with progressive keratoconus in the right eye. Post surgery, the mean keratometry reduced from 48 D to 44 D, which also resulted in the reduction in refractive cylinder from -4.00 D to -1.00D and improvement in best corrected visual acuity from 20/80 to 20/40. shows the clinical picture of the same eye at 15 days and 6 months post op, showing a clear and well centered doughnut lenticule in situ.

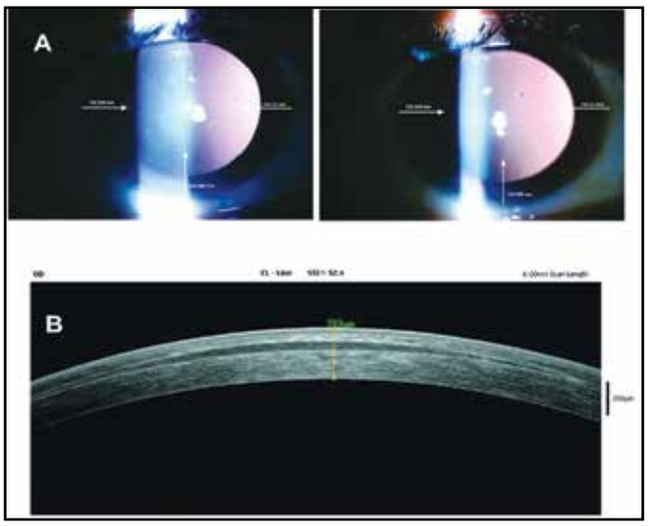

Figure 2A: *Clinical pictures of the same patient (Figure 1) at 15 days and 6 months showing clear and well centered lenticules, which remained stable and did not shift over time.* ***B:*** *AS-OCT of the same eye showing the lenticule in situ.*

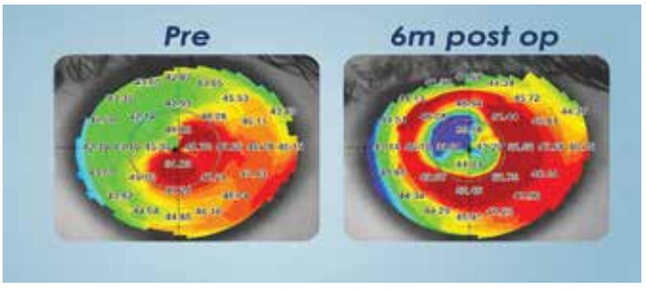

Figure 3: *Keratometry (Sirius) changes for the RE of a 26 year old patient of progressive keratoconus with preoperative Spherical Equivalent (SE of -3.50D for which a donor lenticule of +3.35D was implanted. Note the reduction in mean K from 48D to 44D. The refractive cylinder also reduced from -1.25/-4.00)20/80) to – 1.5/-1.0 (20/40)*

MECHANISM OF ACTION OF TISSUE ADDITION IN KERATOCONUS

It is debatable whether this technique is analogous to the ICRS in terms of the mechanism of action because both techniques involve addition of the material in the midperiphery. Although ICRs are polymethylmethacrylate rings that act as a spacer between the corneal lamellae causing shortening of the central arc proportional to the ring thickness, we theorize that FILI involves addition of natural corneal tissue, which acts more like a "filler" and seems to cause local elevation in the midperiphery and relative flattening in the center, without actually causing much tensionor pull on the corneal lamellae as the ICRS do. Thus, tissue addition causes a change in shape of cornea making it closer to more natural prolate shape, and the accelerated cross linking helps in halting the progression of the disease process.

Tissue addition may be considered as a resurgence of Barraquer's principles and techniques of using cryolathed corneal tissue for management of refractive errors. The older techniques could not become popular due to unpredicatibity of results and adverse effects such as suture related complications and infections .However, with the advent of femtolasers, the accuracy and predictability of the tissue addition techniques has improved significantly thus improving patient outcomes.

As earlier commented, its applications in the field of hyperopia and keratoconus have already been explored. This may provide significant benefits to patients with high hyperopia (>+4D), where LASIK is not expected to deliver a good quality vision due to induced aberrations and decentration issues. Also, for keratoconus, this may be an alternative to intracorneal ring segments (ICRS), provided the nomograms are refined further. It also improves the quality of vision by regularization of the shape of cornea and reducing aberrations. Unlike ICRS, this technique does not have complications such as extrusion, perforation , migration, tissue deposits and infection.

Hence, considering the potential advantages over the existing techniques, tissue addition techniques may be considered, subject to availability of the

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tissue. This may not be an issue with refractive surgeons performing high volumes of ReLEx SMILE at their centres. The extracted lenticules may either be used immediately (on the same day) or preserved for a short or long term to be used at a later date. Short term preservation may be performed using Cornisol or normal saline, which preserve the integrity of the tissue for a 7-8 days. Long term or indefinite term storage may be achieved with cryopreservation using liquid nitrogen at -196 degrees C.

Low risk of rejection

Although the procedure certainly amounts to corneal transplantation, which could carry a risk of rejection, the risk is however low. Unlike traditional full thickness grafts, which have a graft-host junction proximal to host limbus, in this technique, the lenticule is well protected in the host corneal pocket and did not come in direct contact with the host's limbal vasculature and immune system, making the risk of allogeneic graft rejection remotely possible. In addition, because the lenticule used is mainly stromal collagen tissue, the probability of rejection is significantly low compared with endothelial rejection.

Nevertheless, there is a need to monitor for signs of rejection and treat it like allogeneic graft rejection should rejection occur as described for one case in of our hyperopia cases. However, since it is a reversible procedure, the lenticule can always be explanted or exchanged in the event of any adverse effects or rejection as demonstrated for the same case.

Another potential area of usage of SMILE lenticules would be management of presbyopia, wherein it may act like a corneal inlay to increase the depth of focus. It may have good potential in managing presbyopia provided the tissue remains clear with time; the main advantages over inlays would be no risk of extrusion, tissue reactions, infections or infiltrates, and above all, reversibility.

Tissue addition using SMILE-extracted lenticules is a new and evolving field in refractive and corneal surgery. With increasing numbers of refractive surgeons transitioning from LASIK to SMILE, the accessibility to corneal lenticules will increase and tissue addition techniques may become popular.

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Safety and Efficacy of CO_2 Laser Assisted Sclerectomy Surgery (CLASS) Combined with Cataract Surgery for Open Angle Glaucoma – A Preliminary Report

Rengaraj Venkatesh, Sabyasachi Sengupta, Sahil Bhandari, Michael Mimouni

Glaucoma is the second leading cause of blindness after cataract, affecting approximately 60 million people worldwide[1]. Conservative treatment includes controlling intraocular pressure (IOP) with hypotensive topical medications and laser trabeculoplasty when appropriate[2,3]. However, surgical options are the only solution when the IOP is insufficiently lowered and/or glaucomatous optic neuropathy worsens and visual field defect progresses. In addition, surgical options are often applied when adverse effects of topical medications are coupled with the patient's lack of compliance to the regimen due to a combination of factors including high cost, lack of accessibility, sensitivity to medications (allergy), and difficulty of instilling the drops into the eye[4]. Despite good overall outcomes, full thickness glaucoma filtration procedures such as trabeculectomy and tube shunt surgery are associated with a relatively higher rate of surgical complications compared to non-penetrating surgery[5,6]. Complications range from foreign body sensation and dellen formation to vision threatening ones such as leaking blebs, hypotony, blebitis, and endophthalmitis.

In order to reduce the complications related to trabeculectomy, non-penetrating filtering surgeries (NPGS) have been tried in the past. Carbon dioxide (CO2) Laser Assisted Sclerectomy Surgery (CLASS) is emerging as an alternative NPGS for glaucoma patients. CLASS alone has been tried in different forms of open angle glaucoma with variable success rate

In order to reduce the complications related to trabeculectomy, non-penetrating filtering surgeries (NPGS) have been tried in the past. Carbon dioxide (CO2) Laser Assisted Sclerectomy Surgery (CLASS) is emerging as an alternative NPGS for glaucoma patients[7-9]. CLASS alone has been tried in different forms of open angle glaucoma with variable success rate.

The purpose of this study was to evaluate the safety and efficacy of CLASS combined with phacoemulsification and intraocular lens (IOL) implantation in patients with POAG and PEXG.

THE IOPtiMate™ TECHNOLOGY

The IOPtiMate™ (IOPtima, Israel) Beam Manipulating System is intended for use in conjunction with CO2 laser technology of a 10.6 µm wavelength. The IOPtiMate™ System consists of a beam manipulating unit, microscope adaptor, and a control unit. The laser ablates the sclera in a pre-selected grid pattern allowing percolation of aqueous through a thin scleral membrane without full thickness penetration[10]. The laser energy is absorbed by the percolating aqueous humor which acts as an automatic-like termination mechanism which prevent from penetration of the globe.

Surgical Technique

All surgeries were performed under retrobulbar or peribulbar anesthesia using a mixture of 3 ml of 2% lignocaine and 1 ml of 0.75% bupivacaine by a single surgeon (R.V.). A fornix based conjunctival flap was fashioned in the superior quadrant and tenon's capsule was thoroughly dissected. Mitomycin C (0.02% MMC) sponges, when used, were placed under the conjunctiva for 2 minutes and washed with 15 ml of saline. A 5x5 mm partial thickness triangular scleral flap, 1 mm into the clear cornea, was raised with a number 15 surgical blade. This was followed by a temporal clear corneal incision with a beveled up 2.8 mm keratome and conventional phacoemulsification under standard settings with in the bag intraocular lens implantation. The superior scleral bed under the raised flap was dried with Weck-Cel sponge and CO2 laser was used to ablate the scleral bed, targeting the gray line until percolation of aqueous humor was noted from schlemm's canal. Residual charred tissue was regularly wiped away with a BSS soaked Weck-Cel sponge and ablation was continued until sufficient percolation was achieved along a region of at least 3-4 mm in length. Anterior chamber was formed with saline from the paracentesis created during phacoemulsification. The scleral flap was sutured with a single apical 10-0 nylon suture and finally watertight closure of conjunctiva was achieved with 8-0 polyglactin sutures.

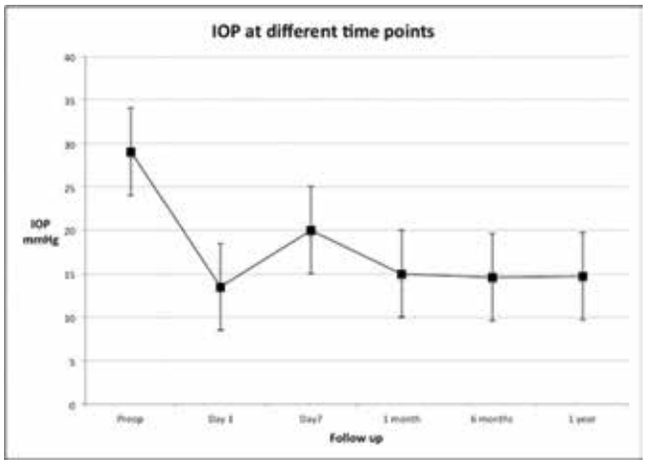

Figure 1: *Intraocular pressure with 95% confidence interval at different time points during the study*

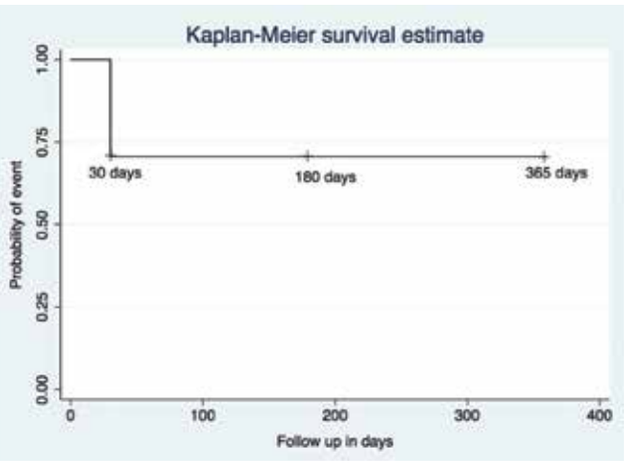

Figure 2: *A Kaplan Meier survival curve showing probability of qualified success/failure during the follow up visits.*

Study details

A prospective, single-arm, non-randomized, open label clinical trial was conducted to determine the preliminary safety and outcome of a novel, minimally invasive laser treatment to perform sclerectomy during glaucoma surgery using the CO_2 laser combined with phacoemulsification. The Institutional Review Board and Scientific Research Committee of the Aravind eye care system approved the study. Informed consent was obtained from each patient and the study followed the tenets of the declaration of Helsinki. Patients above the age of 18 years, with POAG or PEXG, with a baseline intraocular pressure (IOP) of >21 mmHg without anti-glaucoma medications, or those on maximally tolerated medical treatment and also with coexistent significant cataract requiring a combined surgery were included. In case of bilateral disease, only the worse eye was included. Excluded from the study were patients with a history of laser treatment for control of IOP, evidence of angle closure on gonioscopy, secondary glaucoma from any other cause, and presence of ocular co-morbidities. Complete medical history was obtained and a comprehensive ophthalmic examination was performed including best corrected visual acuity (BCVA), measurement of IOP with Goldmann tonometry (average of 3 consecutive readings), gonioscopy by a 2 mirror Goldmann indirect gonioprism, dilated slit lamp biomicroscopy to grade the cataract status using the Lens opacification classification system (LOCS III) and fundus and optic disc examination using a +90D lens. Functional analysis of optic disc was done by Humphrey Visual Field analysis and Optical Coherence Tomography respectively as per hospital protocol. Anti-glaucoma medications were continued until one day prior to surgery. On the day of surgery IOP was controlled by administration of intravenous mannitol. All patients underwent combined CLASS with conventional phacoemulsification with or without Mitomycin C application (0.02% for 2 min). Intraoperative details including the complications were recorded.

Post-operative analysis and outcome measures

Postoperative care included antibiotic and steroid combination eye drops in a weekly tapering dose for 8 weeks. Follow up was scheduled at 1 day, 1 week, 1, 3, 6 and 12 months. At each follow up a complete ophthalmic examination including the bleb morphology was performed. In case the IOP was >18 mmHg, anti-glaucoma medications were added at the 1-month postoperative visit. In cases of a failing bleb, measures such as suturolysis, needling with mitomycin C (MMC) and goniopuncture were permitted as per standard protocol described previously[11]. Complete success was defined as IOP ≥5mm Hg and ≤18mm Hg without any anti-glaucoma medications. Qualified success was defined as IOP ≥5mm Hg and ≤18mm Hg with anti-glaucoma medications. Failure was defined as IOP<5mmHg or IOP >18 mmHg with one or more anti-glaucoma medications or need for re-surgery. Cases of macro-perforation were included in both, the efficacy and safety profile analysis.

Results

Seventeen eyes of 17 patients were included in the study. Mean age of presentation was 60 ± 11.7 years and 11 were males (64%). Nine eyes (53%) were treatment naïve at time of recruitment, while 7 were on one anti-glaucoma medication and 1 patient was on 2 medications. Mitomycin C was used in 88% of the subjects. The mean pre-operative IOP was 29.0 ± 12.3 mm Hg and it decreased to 14.6 ± 4.3 mm Hg at 12 months follow up (p<0.001). Figure 1 shows median IOP at different time points

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during the study. The treatment naïve eyes (n=9) had a preoperative IOP of 33.1 ± 5.1 mmHg and this reduced to 14.3 ± 1.0 mmHg ($p<0.001$, paired t test) at 6 months and 13.5 ± 1.0 mmHg at 1 year follow up ($p<0.001$). In this group required a 3 out of the 9 eyes (33%) required anti-glaucoma medications at one year. In the group with medically controlled IOP on maximal therapy, the mean preoperative IOP was 24.3 ± 1.8 mmHg and this reduced to 15.0 ± 2.5 mmHg at 6 months and 15.8 ± 1.8 mmHg at 1 year follow up ($p<0.001$ for both, paired t test). Out of these 8 eyes, only one (12.5%) required anti-glaucoma medication at the end of one year. Except for significantly higher IOP preoperatively, treatment naïve and those on maximal therapy did not differ in the mean IOP at the 6 month and 1 year time points ($p>0.05$ for both). The mean BCVA improved from 0.9 ± 0.1 log MAR units to 0.3 ± 0.2 log MAR units at 1 year follow up ($p<0.001$).

The complete success rate after 12 months was 70.5%, whereas qualified success was seen in an additional 17.6% for a total of 88.1%. A Kaplan-Meier survival curve (Figure 2) shows that most of those who experience either qualified success or failure did so at the 1 month follow up period. Two eyes experienced failure out of which one was treatment of naïve PEXG with preoperative baseline IOP of 68 mmHg, which reduced to 20mmHg at 1 year postoperative period, with 2 anti-glaucoma medications. One case was converted to conventional trabeculectomy secondary to inadvertent perforation; otherwise no other intraoperative complications occurred. No significant postoperative complications were noted at 12 months of follow up. No additional invasive procedures for failing blebs were required.

Discussion

Non-penetrating glaucoma surgery (NPGS) has been established as a modality of treatment with a lower risk of bleb related complications and a similar efficacy at the expense of a long learning curve when compared to trabeculectomy[12]. CLASS is a new emerging modality with the added advantage of a short learning curve and a high safety profile. Experimental in-vivo and in-vitro studies have proven the safety and performance of CLASS[10]. Previous clinical studies have also showed that CLASS is safe, simple and effective in controlling IOP in the short and intermediate term in primary open angle glaucoma and pseudoexfoliation glaucoma subjects.

We found a significant reduction in mean IOP after 12 months of follow up and complete success was seen in 70% of the eyes. In a prospective single arm, non-randomized trial, using similar definitions of success as in our study, Skaat et al reported 45% complete success and 90% qualified success for POAG and PEXG using the CLASS procedure. A multicentric non-comparative study enrolling 37 eyes with POAG and PEXG reported 76% completed success at 6 months and 60% at the end of one year, using identical definitions of complete success as our study. We speculate that a higher rate of complete success in our series might be due to the synergistic effect of performing a combined CLASS with phacoemulsification surgery. Cataract surgery by itself is well known to cause reduction in IOP and this is believed to occur as a result of widening of the anterior chamber angle that in turn facilitates aqueous drainage[13,14]. Thus, combining CLASS with phacoemulsification may reduce IOP and explain the greater complete success rate in our study.

In a retrospective comparison between the CLASS and conventional NPGS, Greifner et al have stated the similar efficacy of both procedures with regards to long term IOP reduction[9]. At 20 months follow up, the authors report complete success in 73% and qualified success in 96% eyes the CLASS arm, similar to our results. However, longer follow up is required to establish the long term success of CLASS.

We experienced inadvertant perforation in one eye which was converted to conventional trabeculectomy with good outcome. In all of the cases, we experienced no difficulty in focusing the CO2 laser beam at the desired site and visualized aqueous percolation indicating successful deroofing of the Schlemm's canal. There was no collapse of the anterior chamber during aqueous humor percolation and a low shallow bleb was seen at the end of surgery.

The role of MMC to augment the results of the presented combined Phaco-CLASS procedure is unclear. Other studies have shown that intraoperatively applied MMC during NPFS procedures results in a lower IOP levels and better success rates[15,16]. We used MMC in a large proportion of our cases and therefore it was not possible to compare the success rates when the procedure is performed with or without MMC.

Our study is limited by the absence of a control group, small sample size and short duration of follow-up. In addition, the use of MMC was left to the surgeon's discretion, therefore the influence of MMC on the treatment outcome cannot be commented upon. Prospective studies that document longer term IOP control and explore the synergistic effect of MMC with CLASS should be performed.

Conclusion

CLASS is a promising procedure offering a minimally invasive alternative to trabeculectomy for the treatment of patients with POAG or PEXG. The ease of use may open the door for the procedure to be performed by general ophthalmologists as opposed to other glaucoma surgical procedures that are almost exclusively performed by glaucoma specialists. Phacoemulsification combined with CLASS is a simple, safe, and effective technique with good short and intermediate term IOP control for treating coexistent cataract and open-angle glaucoma.

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Hess Charting

Namrata Patel, Reena Sharma, Brahmadeo Sharma, Gaurav Dwivedi

The Hess screen test was designed by Walter Rudolf Hess in 1908[1]. More than a century later, it continues to be a useful means of analyzing and recording muscle imbalance in patients with diplopia. It is therefore used in the evaluation of incomitant strabismus in order to assess the paretic element. It basically measures the ocular deviation and the amount of underaction and overaction of extraocular muscles. It is a repeatable and reliable recording of these actions and can therefore be used to follow up patients with incomitant strabismus.

PRINCIPLE

It is based on the principle of foveal projection. The two eyes are dissociated by using red/green complementary filters. This maximizes the ocular deviation. The chart is plotted based on the Hering's law of equal innervations and Sherrington's law of reciprocal innervation.

Lees screen is a modified hess charting which can also be used for the same purpose and is based on similar principle[2]. It however dissociates the two eyes using a mirror.

METHOD

There is an illuminated Hess screen which is 3 ft wide and 31/2 ft long, marked out by a series of lines subtending an angle of 5°between them. At the zero point of this coordinate system and at each of the points of intersection of the 15° and 30° lines with one another and with corresponding vertical and horizontal lines, there is a red dot. These dots form an inner square of 8 dots and an outer square of 16 dots, on which each target can be lit up in turn and its position indicated by the patient using a green light (Figure 1).

The test is performed with each eye fixating in turn. It is done at 50 cms. Patient wears complimentary red and green glasses. Left eye is tested first followed by right eye. The red glasses are placed on the right eye first (Red for right). Hess chart consists of a screen incorporating a tangent pattern on a black/grey background (Figure 2). It may be manually or electrically operated.

A red target is illuminated or projected at various points on the tangent screen (at the juncture of tangent lines). The torch with the green light is in patient's hand (Figure 3). Patient is asked to place the green light over the red light shown by the examiner at various points on the chart.

Next the goggles are changed and the left eye has red goggles. Thus, the inner and outer ranges of ocular rotation are checked for right eye. The eye with the green glasses is the eye being tested, with the other eye being the fixing eye. The required points are joined to form an inner and the outer square[3], and are recorded on a paper chart.

It is important that the patient's head remains straight throughout the test. Occasionally, it becomes necessary to hold the head in the correct position. The foveae must also have a common visual direction.

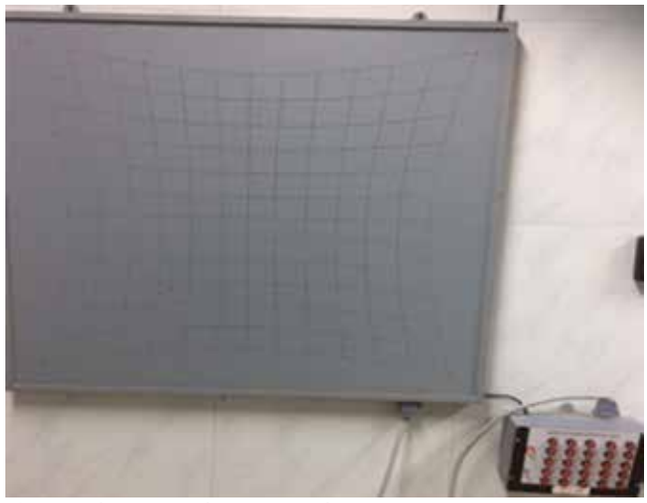

Figure1: *Shows a modern Hess Red-Green Screen Test.*

Figure2: *The wall-mounted screen is marked with a tangled scale. Dissociation is by use of a standard pair of red-green goggles and the patient's responses are confirmed by a laser pointer with green light.*

INDICATIONS

Any patient who complains of double vision should be tested on Hess chart. Specific indications are

a. All patients of incomitant strabismus with normal retinal correspondence (NRC).
b. Patients of esophoria or intermittent Esotropia of divergence weakness type to rule out 6th nerve palsy.
c. To provide a baseline and follow up in conditions likely to develop defective ocular movements like in thyroid related orbitopathy.

Figure3: *Green laser pointer*

It is used to diagnose the affected muscle. The amount of ocular deviation can also be estimated from the extent of shift of the plot from its normal position. We can also interpret the development of muscle sequelae to differentiate recent onset/ longstanding muscle paralysis[4]. This could help the ophthalmologist in planning the treatment and evaluate the results. However, a Hess chart should not be viewed in isolation; importance of a good clinical ocular motility examination cannot be understated. Diplopia charting and binocular visual field testing are other adjunctive tests that help in the better evaluation and thus management of the patient.

INTERPRETATION

The interpretation of Hess chart is done on the basis of three parameters-

a) Hess Chart position: The higher field belongs to the higher eye. This is in contrast to diplopia charting where the higher image belongs to the hypotropic eye. The position of the central dot indicates the ocular deviation in primary position.

b) Hess Chart size: The size of the Hess chart correlates with the Hering's law. Smaller field belongs to the eye with primary limitation of movement. Underaction is seen as the inward and overaction as outward movement of the dots and therefore the whole curve. Maximum displacement occurs in the direction of the affected muscle.

The maximum displacement occurs in the direction of the overacting contralateral synergist in the larger field. Outer field should be examined for small underactions and overactions which may not be apparent on the inner field. Equal sized fields denote either a symmetrical limitation of movement in the two eyes or a non paralytic strabismus.

c. Hess Chart Shape and measurements: Knowing that each small square on the grid subtends 5 degree at the working distance of 50 cm, the amount of ocular deviation can be calculated. In primary position, the amount can be calculated by the displacement of the pointer from the central dot. The amount of underaction and overactions can be calculated in the various positions and hence the amount of excursion can be calculated

The Hess charting is a milestone in the history of mapping out ocular deviations. The fields can be obtained from children as young as eight years. It requires a good visual acuity and normal colour vision. It also requires a normal retinal correspondence since the results will be inaccurate if the patient cannot superimpose two macular images.

The newer system (automated Hess screen, AHS) for the measurement of ocular motility using a computer has also been described[5,6].

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Sub-Conjunctival Dirofilariasis- A Case Report and Indian Scenario

Satish Jeria, Manav Deep Singh, Praveen Kumar Malik, Ashok Pathak, Ekta Sain

A 50- year- old police constable from Delhi presented to the outpatient department of Dr. R M L hospital, New Delhi with complaints of sudden onset pain, redness and foreign body sensation of three days duration in his left eye. There was no history of trauma, contact with animals or travel outside North India. There was no history of similar episodes in the past.

Ocular examination of right eye was normal and his left eye showed nodular swelling in subconjunctival region on nasal side with hyperemia over it. On further magnification it revealed coiled structure with motility (Figure 1). Vision was not affected and no reaction was seen in anterior chamber. His fundus was normal. By the time his pupils got dilated, the shape and size of the subconjunctival structure changed and position shifted superiorly (Figure 2).

On general physical examination, no superficial nodule was noted anywhere in the body. No pallor, icterus or lymphadenopathy was seen.

With a tentative diagnosis of a subconjunctival parasite, a small conjunctival incision was made over the lesion under local anesthesia and a live worm was extracted. The subconjunctival area was thoroughly explored for evidence of other worms and/ or eggs/ larvae. It was transported to the department of microbiology, in normal saline, for identification.

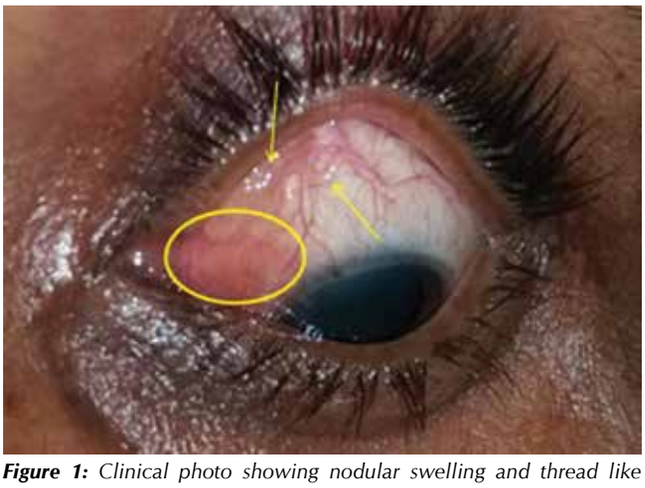

Figure 1: *Clinical photo showing nodular swelling and thread like structure*

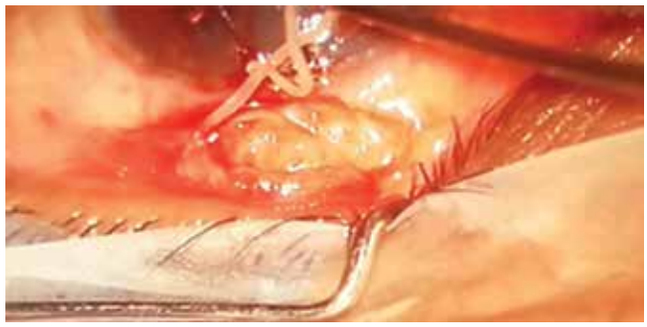

Figure 2: *Preoperative photo*

Figure 3: *Stretched length of adult worm*

Figure 4: *Microscopic 40X view of anterior end*

Post operatively, topical antibiotic and steroid combination was given which was later tapered off. Patient was asymptomatic

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Table 1: Differences between D. repens and D.immitis	
D. repens	D. immitis
Cross section diameter 220-600 microns	140-300 microns
Thick cuticle	Smooth cuticle
Distance between two ridges is wider than width itself	No or attenuated ridges

Table 2: Case reports of subconjunctival dirofilariasis from India

S. no.	Author	Year	Length (cm)	Gender	Species	Region
1	Joseph et al	1976	13.5	Female	(Conjunctiva) D. repens	Kerala
2	Nadqir et al	2001	3.5	Male	D. repens	Karnataka
3	Gautam et al	2002	8.3	Male	D. repens	Haryana
4	Nath et al	2010	13	-	D. repens	Assam
5	Joseph et al	2011	12.5	Female	D. repens	Kerala
6	Bhat et al	2012	-	Female	D. tenuis	Kerala
7	Sangit et al	2012	3.5	Female	D. repens	Maharashtra
8	Patel et al	2014	6.5	-	D. repens	Gujarat
9	Subhramanyamet al	2014	-	-	D. repens	Karnataka
10	Archana et al	2015	6	Male	D. repens	Maharashtra

in postoperative period. No abnormality was seen in routine blood, stool and urine tests. Eosinophil count was normal. Blood smear was negative for microfilarie.

The worm was 9 cm in length, white in color and cylindrical in appearance (Figure 3). Anterior end was wider than posterior end (Figure 4). Posterior end showed subterminal anus (Figure 5). Body of the worm depicted longitudinal cuticular ridges and transverse striations (Figure 6). On the basis of morphology, it was identified as female Dirofilaria repens.

DISCUSSION

Human Dirofilariasis is caused by accidental infestation of dirofilaria by bite of mosquitoe vector (anopheles, culex, aedes) carrying infective larvae (Figure 7). These worms rarely reach maturity in humans and therefore microfilaremia is not seen. It can present as subcutaneous nodule, periorbital swelling or intraocular inflammation. Some species can cause pulmonary, breast or genital involvement also. Subconjunctival dirofilriasis can mimick nodular scleritis, episcleritis or even conjunctivitis.

Figure 5: *Microscopic 40X view of posterior end*

Figure 6: *Magnified view of 40X of body of worm showing characteristic longitudinal cuticular ridges and transverse striations*

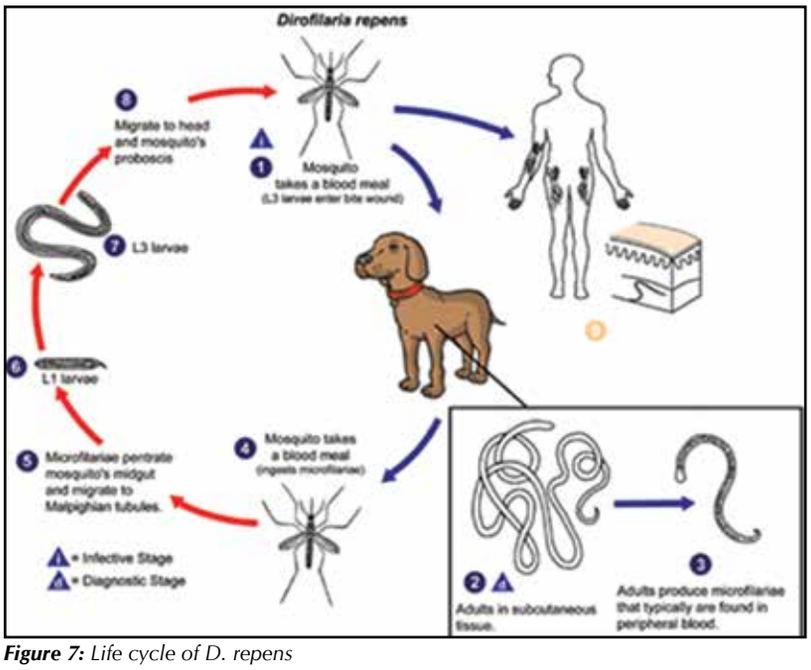

Figure 7: *Life cycle of D. repens*

Diagnosis is evident clinically. Out of almost 40 known species of Dirofilaria, five have been implicated in human infestations. Dirofilaria repens and D. immitis are the only two species reported to have caused ocular or periocular infestation. These can be differentiated on the basis of morphology and sometimes PCR test [Table 1][1,2]. Histopatholgy can confirm the species by the study of external organs of the worm[3].

Surgical extraction of worm is the definitive treatment. Role of antihelminthic drugs (Ivermectin, DEC) is controversial. Most of the authors do not recommend use of these drugs in D. repens. However, these have been

recommended in case of D.immitis[4].

Approximately 800 cases of ocular dirofilariasis have been reported worldwide[5]. In India there are around 15 cases of subconjunctival dirofilariasis which have mainly been reported from southern and western regions. Only one case of subconjunctival dirofilariasis has been reported from North India [Table 2].

CONCLUSION

Human dirofilariasis is an emerging zoonosis. Although it is rare in India and rarer in northern India, its incidence is increasing worldwide. This entity should be kept in mind as a differential diagnosis whenever patient complains of nodular swelling or shifting congestion.

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Clinical Case presented in the DOS Monthly Clinical Meeting held in Ram Manohar Lohia Hospital on 29th January, 2017

Non Hodgkin's Lymphoma – Microfilaria Bonhomie

Pratima Mishra, Taru Dewan, Kishor Govekar, Ritu Kumari, Navita Yadav

13 year old female, resident of Bihar had presented to our hospital with complaints of two episodes of painless bleeding from right nostril separated by an interval of fifteen days, followed by painless progressive swelling localized to right upper neck. For these complaints she was taken to the doctor in their area who had brought to their notice that her right eye was protruding. This protrusion had been painless and progressive and was accompanied by loss of vision in the same eye after fifteen days. The loss of vision in the right eye had started as painless blurring and had progressed to no perception of light.

Patient did not have any history of systemic illness, trauma or any medical or surgical intervention.

She is the fifth product of consanguineous marriage and was born through a full term normal vaginal delivery. Achieved her milestones as per age but, had not been immunized according to the national schedule.

Examination – General physical examination showed significant cervical lymphadenopathy (right level IB approx 4X4cm, right VA and VB approx 13mm) and right pre auricular LN measuring around 8mm. These nodes were non tender, firm, non- matted, not adherent to underlying structures or overlying skin, LNs were not palpable in supraclavicular, axillary or inguinal region.

Central nervous system examination along with cranial nerves I, V, VII-XII were normal on both the sides while II, III, IV and VI were normal only on the left side. Perception of light was denied from the right eye, right III CN was paretic and the status of right IV and VI CN was difficult to assess due to fixity of the globe.

Ocular examination – Perception of light was denied in right eye, unaided visual acuity was 6/6 in left eye and near vision N6.

Facial symmetry was not maintained due to fullness over the right maxillary area which extended till the right nasolabial fold with loss of right supraciliary sulcus. Palpebral aperture of the right eye was larger than the left, measuring 19mm vertically and 30mm horizontally. Right eyeball was pushed forward and outward stretching the lids over the globe. A divergent squint of approx 30 degrees with R/L of approx 15 degrees was noted (Figure 1a,1b).

Right eye EOM were restricted in all the gazes as was also seen on FDT. On palpation fingers could not be insinuated between the right eyeball and its superior and medial orbital margins. Exophthalmometry showed 12mm proptosis of the right eye.

On pupillary examination anisocoria was present, right eye pupil measured 5mm and the size of left pupil was 3mm with right afferent pupillary defect. Fundus examination of both the eyes was within normal limits.

Figure 1

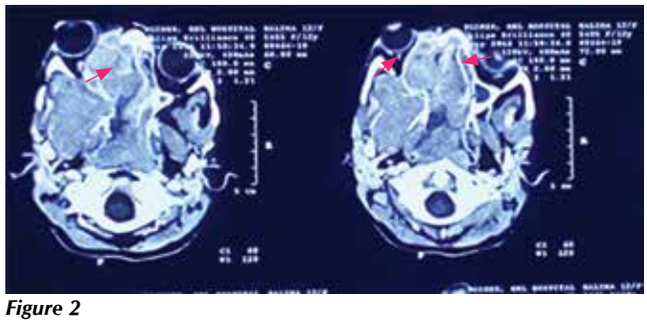

Figure 2

B-scan of the right eye showed an echogenic area with moderate intensity spikes behind the globe in the inferonasal orbit.

On blood investigation hemogram was normal except eosinophila. Contrast imaging showed a heterogeneously enhancing lesion in the right maxillary sinus and right nasal cavity infiltrating the right orbit and pushing the nasal septum and the right optic nerve in its anterior part (Figure 2).

Histopathology done from the mass in the right nasal cavity showed features suggestive of Non Hodgkin's Lymphoma, similar findings were present on FNAC where aspirate was taken from the swelling in the right upper neck. A microfilaria

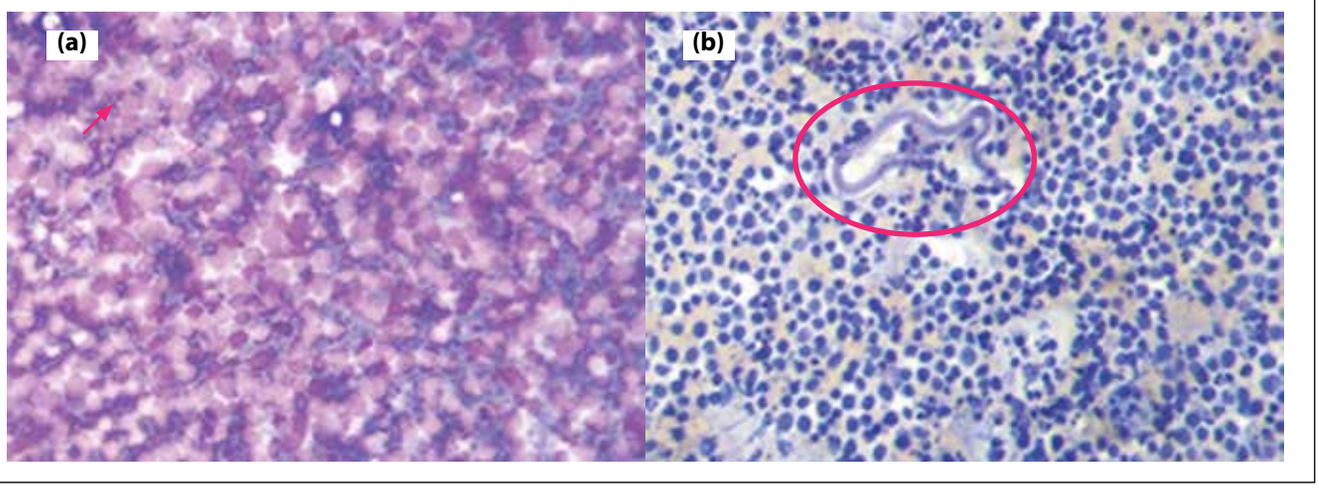

Figure 3

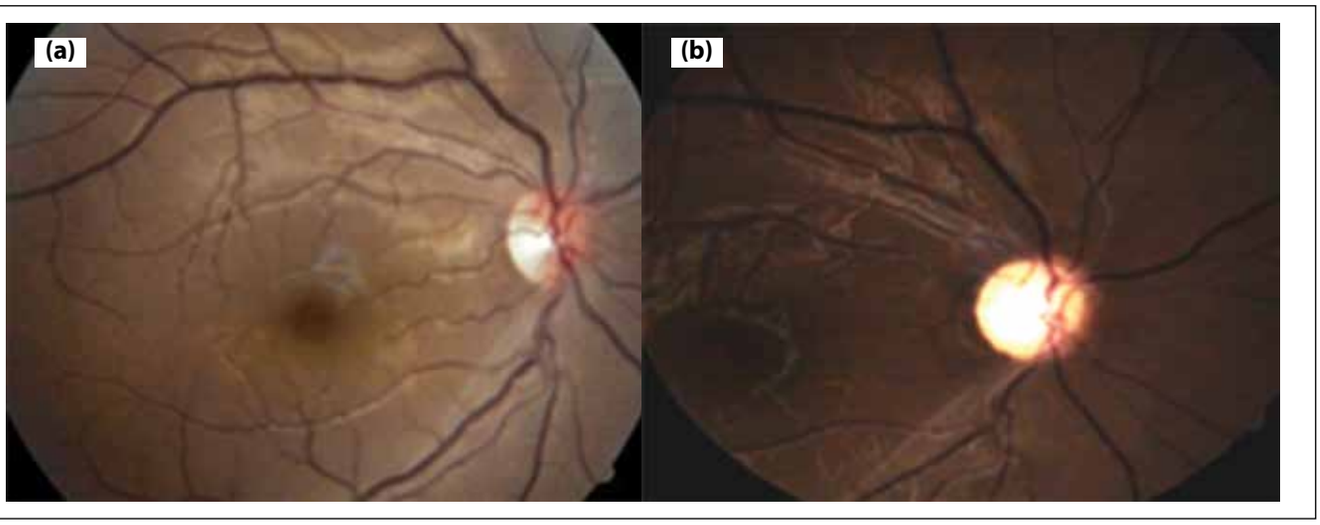

Figure 4

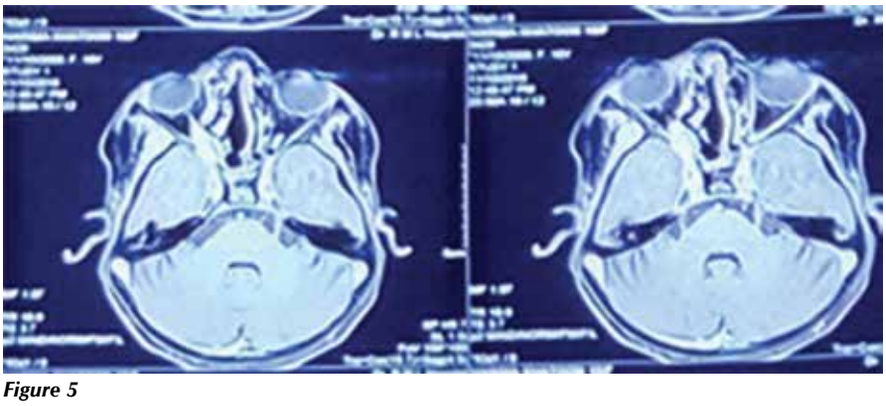

Figure 5

larva was found in one of the FNAC slides (Figures 3a,3b).

So we made the diagnosis of Right eye Abaxial proptosis with Sinonasal - Orbital NHL with Retro bulbar optic neuropathy (compressive) with partial third nerve paralysis and Microfilarial infestation.

Patient was categorized in R4 risk group and has been receiving chemotherapy in our institution under pediatric oncology department

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Figure 6

based on the NHL BFM-95 regime. Diethylcarbamazine was given for microfilaria infestation.

Examination and imaging were repeated after the first and second cycle of chemotherapy. Patient regained significant vision in right eye from no perception of light to finger counting close to face. Anisocoria too had reduced with RAPD in RE. On fundus examination temporal disc pallor was found after the first chemo cycle that had progressed to complete disc pallor after the second chemo cycle (Figures 4a, 4b).

On imaging the size of the lesion had reduced significantly as compared to the pre chemo scans, the right inferior rectus muscle appeared thickened probably infiltrated by the NHL (Figure 5).

Flash VEP of the right eye showed visual potential with increased latency of P100 wave.

There was marked improvement in extra ocular movements with slight under action of RE inferior oblique and inferior rectus muscle (Figure 6).

Patient is still undergoing chemo at regular intervals as mentioned in NHL BFM-95 regime and is under regular follow up in Ophthalmology department.

DISCUSSION

Involvement of the orbit may be secondary to NHL of sino nasal tract or may be a co-existent primary involvement. Primary lesions of the orbit are rare however spread from the sino nasal tract appears to be more likely.

The low grade lymphomas present as mass in the nasal cavity or paranasal sinuses with obstructive symptoms and /or lymphadenopathy. Whereas the high grade T-cell lymphomas present with nasal septum perforation or destruction and patients with B-cells lymphomas have aggressive signs and symptoms, soft tissue or bony destruction particularly of the orbit with associated proptosis or epistaxis, as was seen in our case.

Literature has mentioned cases where Microfilaria and adult filarial worms have occasionally been detected in association with neoplastic lesions in cytological smears. The rich vascular supply of tumours could encourage the concentration of parasites at the tumour sites in otherwise asymptomatic microfilariasis.

Cases have also been reported where NHL has been found in association with microfilaria. The presence of microfilaria along with neoplasms is generally regarded as a chance association, yet some authors suggest that such parasitic infestations may be a causative factor for tumorigenesis.

Thus increased predilection of FNAC proven microfilariasis for neoplasms warrants a detailed study of potential role in tumorigenesis.

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Clinical Case presented in the DOS Monthly Clinical Meeting held in Ram Manohar Lohia Hospital on 29th January, 2017

Management of Acute Stevens-Johnson Syndrome in a Child

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A 8 year old child presented to our hospital in October 2016 five days after the history of development of rashes all over his body after following intake of tablet ciprofloxacin for fever. On examination, he had target lesions over his body and oral mucosal involvement. He was admitted under the care of a pediatrician and diagnosed with acute Stevens-Johnson syndrome. Subsequently systemic steroids were administered along with fluids and supportive management. He complained of redness and stickiness of both the eyes and an ophthalmology opinion was sought. On bedside examination, there was crusting and ulceration of all four lid margins with loss of eyelashes. He had bulbar congestion in both his eyes (Figure 1). On staining the ocular surface with fluorescein, the corneal and conjunctival epithelium was found to be intact although there was superficial punctate keratitis in both his eyes. The child's upper and the lower tarsal conjunctiva and fornixes could not be examined properly as he was extremely symptomatic. We could not document visual acuity at this visit for the same reason. He was started on 1 hourly topical steroids along with antibiotic and lubricant eye drops. The plan was to go ahead with a human amniotic membrane graft (hAM) as soon as possible. It was not possible to do the procedure bedside as the child was symptomatic and uncooperative. Therefore, we had to wait for the general condition of the child to stabilize. He subsequently developed viral Chikungunya encephalitis causing a further delay in clearance for general anesthesia. We performed the amniotic membrane grafting in both his eyes two weeks after the onset of rash.

SURGICAL PROCEDURE

The procedure was performed under general anesthesia under all aseptic precautions. The eye lashes of the upper eyelid were trimmed in the right eye. The upper lid was everted and membranes over the tarsal conjunctiva were peeled off using McPhersons forceps (Figure 2A). The underlying bare conjunctiva was covered with lyophilized human amniotic membrane (Figure 2B) and secured in place with fibrin glue (TISSEEL Kit from Baxter AG, Vienna, Austria) (Figure2C, 2D). The excess glue was trimmed using Vanna's scissors (Figure2E). The lower tarsal conjunctiva was dealt with in the same fashion. In the end the bulbar surface was covered with hAm (figure 2F) and anchored in place with 4 interrupted 8-0 vicryl sutures.

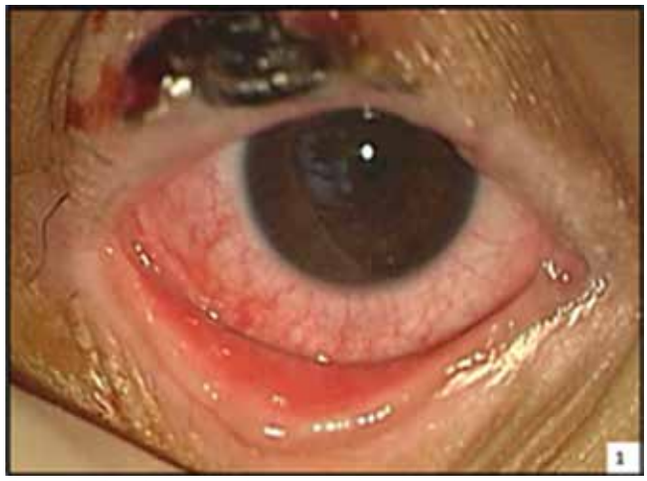

Figure 1: *Crusting, ulceration and madarosis of right upper and lower lid associated with bulbar congestion*

The same procedure was repeated for the left eye as well. The eyes were patched overnight.

OUTCOME AND FOLLOW UP

Post-operatively, topical prednisolone acetate 1% eyed drops 2 hourly along with antibiotic and lubricant eye drops were prescribed. Topical prednisolone acetate eye drops were gradually tapered over 2 months. The child was symptomatically better and co-operative for examination. The visual acuity was 20/40 in both eyes. There was no formation of symblepharon and the eye was quieter. However, two weeks after the hAm procedure, the right cornea developed an epithelial defect of approximately 1X 1.5 mm inferiorly (Figure 3A). The child was induced under general anesthesia and hAM was placed over the epithelial defect with fibrin glue (Figure 3B). A bandage contact lens was placed and the eye was patched overnight. The epithelium healed within a week and the ocular surface remained stable in both his eyes (Figure 4A). The visual acuity also remained stable at 20/40 in both his eyes. One month after the first surgery the right upper and lower lid as well as left upper lid developed keratinization at the muco-cutaneous junction (Figure 4B, 4C). No keratinization was noted in the left lower lid however, Meibomian glands appeared distorted (Figure 4D). Subsequently, a lid margin mucous membrane graft was performed elsewhere, close to the child's native place.

DISCUSSION

Acute Stevens-Johnson Syndrome (SJS) is a rare, exfoliative inflammatory disorder involving skin and mucous membranes[1]. The term SJS is used when the denuded cutaneous area is less than 10% of the total body surface area (BSA). When more than 30% of BSA is involved, then the condition is termed as Toxic Epidermal Necrolysis (TEN) which is a more severe form of the same spectrum. When the cutaneous blisters involve between

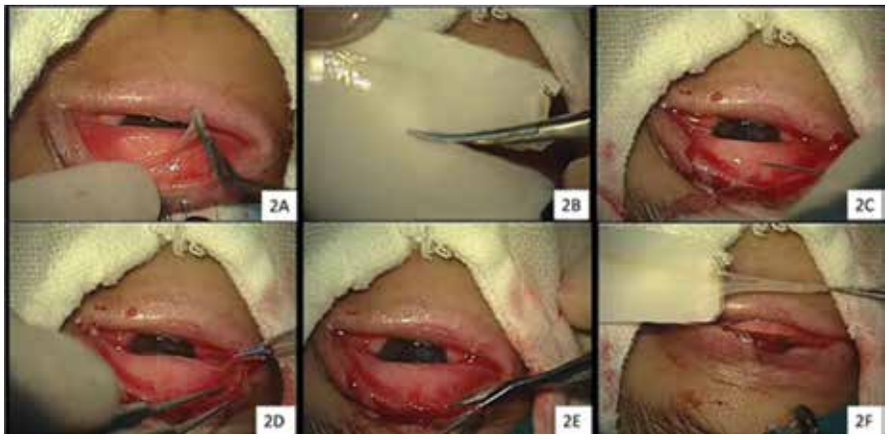

Figure 2: *Surgical steps of placing an amniotic membrane graft.* ***2A:*** *Peeling the membranes off the tarsal conjunctiva* ***2B:*** *The cryopreserved hAM with stromal side down cut into adequate size* ***2C:*** *Placing the fibrin glue over the raw areas to anchor hAM* ***2D:*** *Ironing out the membrane on the tarsal surface and securing it in place without any wrinkles or folds* ***2E:*** *Trimming the excess glue with Vanna's scissors* ***2F:*** *Placing hAM on the bulbar surface.*

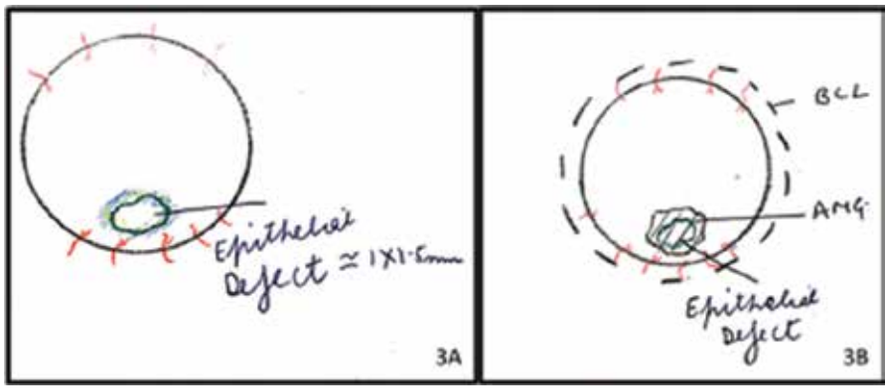

Figure 3A: *Diagrammatic representation of the epithelial defect in right eye 2 weeks after hAM transplant.* ***3B:*** *Diagrammatic representation showing hAM placed over the epithelial defect with bandage.*

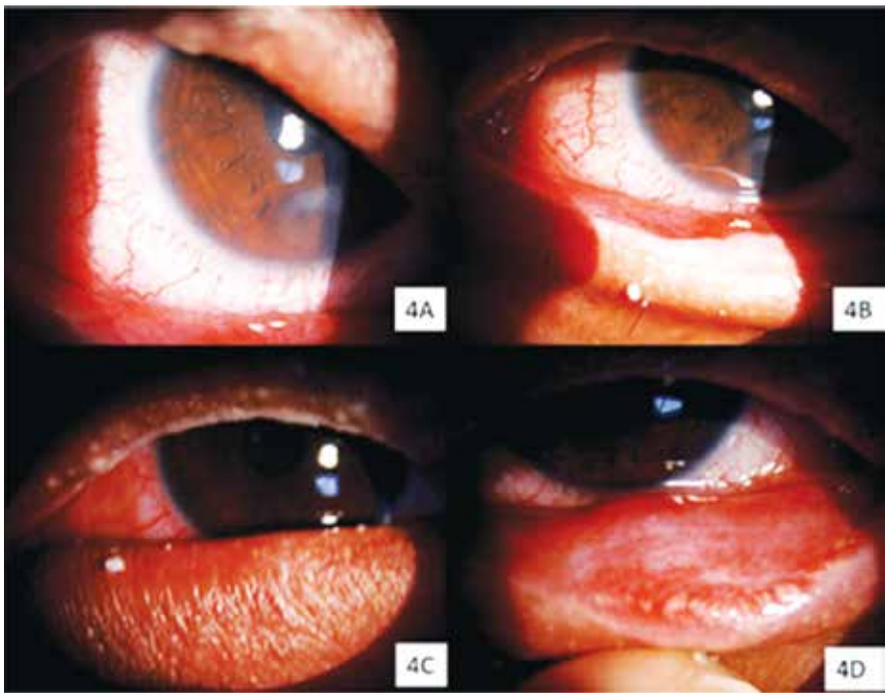

Figure 4A: *Healed epithelial defect with BCL in place in right eye.* ***4B:*** *Keratinization of the upper and lower lid in right eye.* ***4C:*** *Keratinization of the left upper lid margin.* ***4D:*** *Distortion of the meibomian glands in left lower lid with absence of keratinization.*

10-30% of BSA, then the term overlapping SJS-TEN is used[2]. The incidence of SJS varies from 1.2 to 6 per million patient-years[3,4]. It is an immune mediated disorder which is usually triggered by drugs and less commonly by viral exanthems[5]. The drugs which can trigger SJS include antibiotics, especially sulfonamide antibiotics, anti-epileptics and oxicam-nonsteroidal anti-inflammatory agents[6]. Ocular involvement in acute stage of Stevens-Johnson syndrome is found in 69-81 % of cases and must be managed appropriately and on an emergency basis. The most common ocular presentation is bilateral conjunctivitis which may be associated with formation of membranes and pseudomembranes[9]. Ocular examination must include staining of the ocular surface with fluorescein to look for conjunctival and corneal epithelial defects along with the presence of membranes on tarsal conjunctiva. Inflammation of the lid margin can cause ulceration, sloughing and madarosis. When both tarsal and bulbar conjunctival surfaces are raw and inflamed, there can be formations of adhesions between the two surfaces giving rise to early symblepharon formation. The aim of treatment is to control the destructive inflammation, maintaining a stable, epithelized ocular surface and prevention against secondary infections. Amniotic membrane aids in rapid epithelization, controls the ongoing inflammation as well as prevents eventual scarring and symblepharon formation[10]. The procedure might need to be repeated for these patients depending on the severity of ocular involvement. In a case series published by Darren G. Gregory, when a cryopreserved amniotic membrane was applied within 10 days of onset, all the patients had a best corrected visual acuity of more than 20/30 with mild to moderate dry eye at 6 months follow up. However, this case highlights the practical issues faced by ophthalmologists in achieving anesthesia clearance in case of children. Systemic pulse steroid therapy also prevents eventual cicatrization of ocular surface and long term sequelae[11]. Chronic sequelae include keratinization of the lid margin, ectropion and entropion. This keratin rubs against the ocular surface leading to repeated epithelial breakdown and pre-disposition to secondary infections. The inflammation at the limbus can induce limbal stem cell deficiency and conjunctivilization of the cornea[13]. The intense inflammation

can disrupt the architecture and destroy goblet cells and accessory lacrimal glands resulting in dry eye of varying severity. Lid margin mucous membrane graft in cases where there is obvious keratinization of the lid margin helps in protecting the ocular surface from the chronic insult caused by the keratin and can even lead to improvement in visual acuity[14,15]. This procedure must be performed as early as possible after healing of the oral mucosa to prevent blinding keratopathy.

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Financial Interest: *The author does not have any financial interest in any procedure/product mentioned in this manuscript.*

Clinical Case presented in the DOS Monthly Clinical Meeting held in Ganga Ram Hospital on 26th February, 2017

Toxic Kerato-Conjunctivitis due to Contaminated Eye Drops

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Cornea & Refractive Surgery Services,
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A 60 year old female presented to our cornea clinic with chief complaints of blurring of vision accompanied with pain, redness and foreign body sensation in both the eyes for past 7 days. There was no history of trauma or any other immediate inciting factor before this episode started. The patient gave no history of fever, joint pain, diabetes mellitus or any other significant systemic disorder. She was diagnosed with cataract in both the eyes 6 months back, for which she was awaiting a surgery. She had consulted an ophthalmologist 3 days back for her ocular condition, and was prescribed some topical medications. For past 3 days she was on treatment with Moxifloxacin 0.5% eye drop 4 times/day, Homatropine 2% eye drop 2 times/day and Naphazoline eye drops 4 times/day. The patient complained of worsening symptoms after starting the treatment.

At the time of presentation patient had a visual acuity of finger counting at 3 meter in right eye and finger counting at 2 meter in left eye. On slit lamp examination she had bilateral lid edema with circumcorneal congestion (left eye more than right). Palpebral conjunctiva was mildly congested with no evidence of any foreign body. Right eye had a central epithelial defect measuring 3mmx2mm with surrounding stromal edema and descemet's folds. Left eye had an epithelial defect measuring 5mmx4mm with stromal edema and descemet's folds. There were no keratic precipitates or hypopyon (Figure 1A & 1B). Anterior chamber reaction was difficult to comment on as corneal haze precluded visualization. Both the eyes showed an immature senile cataract. Right eye had a good fundal glow, but retinal details could not be seen. Left eye fundal glow could not be seen.

Differential diagnosis of toxic kerato-conjunctivitis or viral stromal keratitis was made. Viral keratitis was kept secondary as there was no history of recurrence of symptoms. A toxic kerato-conjunctivitis like picture like this has been reported following exposure to calotropis plant sap to the eye1. The patient was started on Eye drop Carboxy methyl cellulose (0.5%) 8 times/day, Eye drop Fluorometholone acetate (0.1%) 4 times/day, Eye drop Moxifloxacin (0.5%) 4 times/day, Eye drop Homatropine (2%) 3 times/d and Eye ointment Hypromellose lubricating gel at night. The patient was called for a review after 2 days. However the patient on the third day reported with worsening symptoms and no clinical improvement. The patient complained of severe irritation and pain on instilling the topical drops and was thus not compliant with the treatment. She was advised stricter compliance with the treatment and asked for a review after another 3 days.

Figure 1

Figure 2

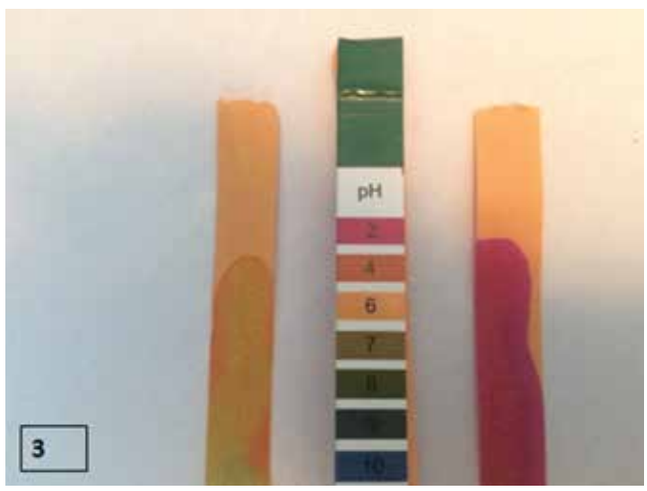

Figure 3: *The strip on right shows the neutral Ph of a normal eye drop, and to the left shows the acidic Ph of the contaminated eye drop*

On her next follow up she was still extremely symptomatic. On examination there was circum-corneal congestion, the epithelial defect had healed in both the eyes. There was diffuse superficial punctuate keratitis, with early sloughing of cornea with increasing corneal edema and haze (Figure 2A & 2B).

At this time it was felt that something was being missed and the initial diagnosis was in doubt. The patient was probed further. She was specifically giving history of severe irritation on using her eye drops. It was suspected that the eye drops were contaminated. On a PH paper strip test it was noted that the drops patient was using gave a PH of 2 (Acidic) as compared

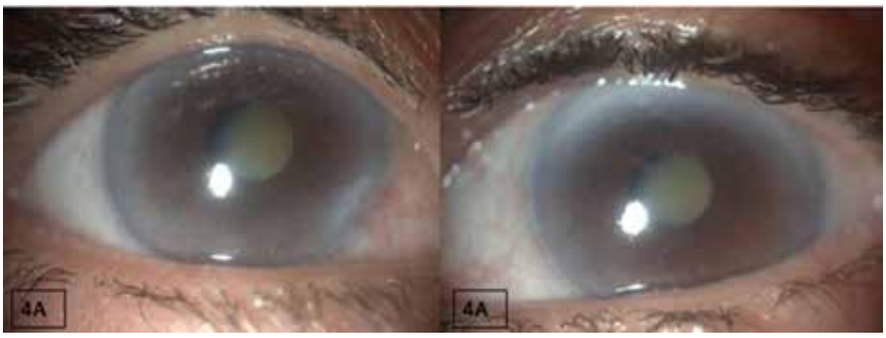

Figure 4

to a normal eye drop which has a Ph of 7 (Neutral) (Figure 3). The patient had a suspicion on one of her daughter who could have been contaminating her eye drops to cause harm to her, because of her vested interest in her property. The patient was asked to discontinue all her previous topical, and purchase new ones and keep them in a safe place with constant watch. She was prescribed Eye drop Carboxy methyl cellulose (0.5%) 8 times/day and Eye drop Moxifloxacin (0.5%) 4 times/day. Within a week the patient had symptomatic relief& vision improved to 20/200 in both eyes. On examination both eyes were quiet with resolved congestion and corneal edema (Figure 4A & 4B).

The case highlights the importance of proper history taking and the fact that the patient's symptoms should never be ignored. Also it emphasizes the need to think beyond clinics at times to clinch the diagnosis.

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Financial Interest: *The author does not have any financial interest in any procedure/product mentioned in this manuscript.*

Clinical Case presented in the DOS Monthly Clinical Meeting held at Dr. Shroff Charity Eye Hospital on 26th March, 2017

MII Ret Cam- Revolution in Cost Effective Eye Imaging

Dr. Ashish Sharma MS
Department of Vitreoretina, Lotus Eye Hospital and Institute, Coimbatore, TN, India

MII Ret Cam (Make In India Retinal Camera) is a fundus imaging device that works on the principle of indirect ophthalmoscopy. However it works as a fundus camera due to its ability to capture fundus images, record and print them.

The device consists of a slot for a smartphone and 20 D lens with optional 28 D lens[1] (Figure 1) The device is specially designed for single hand operation. This allows the other hand to be utilized either for indentation or to open the patient's eye lids. The device has been designed to fit any smartphone either Android or IOS provided distance between cameras or flash light is close.

MII Ret Cam Device needs a smartphone app (miiretcam app) while imaging. MII Ret Cam utilizes the smartphone light itself as an illumination source. MII Ret Cam app allows the smartphone flashlight to be ON even in still picture mode. Furthermore it allows patient data storage which can be easily shared.

MII Ret Cam overcomes imaging difficulties of traditional fundus cameras such as cost, portability, peripheral imaging, and pediatric imaging (Figure 2). MII Ret Cam can also be utilized in diffuse light Anterior Segment Imaging.

Figure 1

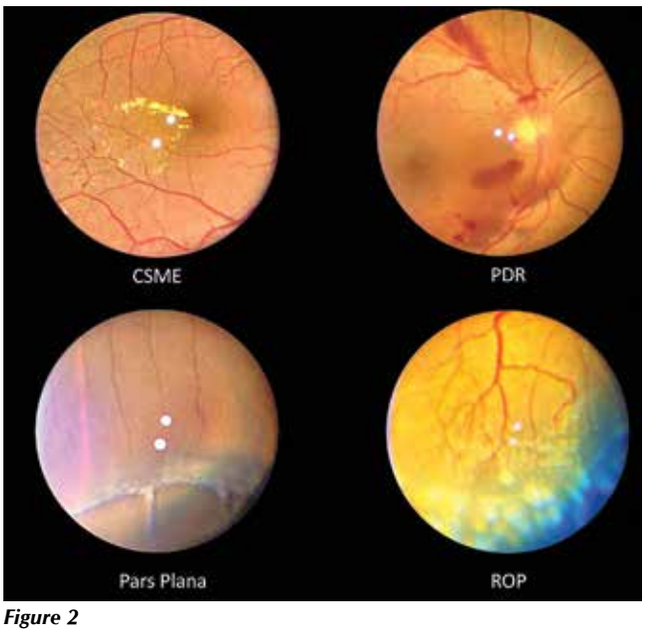

Figure 2

ADVANTAGES

Single hand operation and light weight (150 gm device weight)

Works with both Android and iphones (MII Ret Cam iOS app has an inbuilt light intensity control, WiFi print)

Ability to capture peripheral retina images up to pars plana

Ability to demonstrate retinopathy of prematurity and other paediatric retinal conditions

Anterior segment imaging

Not dependant on Slit lamp

Limitations

Need dilation

Areas where MII Ret Cam is making a difference at ground level globally

1. Postgraduates and fellows- Rather than traditional ophthalmoscope based clinical examination and training, MII Ret Cam allows cost effective imaging and sharing the images seamlessly through MII Ret Cam app. This helps postgraduates in their evidence based learning. Even if they go for medical ward rounds they can captures images and seek instant opinion. This approach enhances learning and improve management of patients.
2. Anterior Segment Specialists- Regular OPD fundus imaging along with diffuse light anterior segment imaging

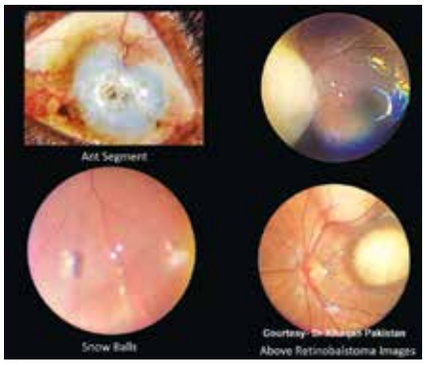

Figure 3

3. Posterior Segment Specialist –
   A- ROP Imaging- There is a wide financial gap in terms of ROP imaging. Retina specialists find it difficult to counsel parents of ROP babies for the treatment. With the help of MARC approach (MII Ret Cam Assisted ROP Counselling), it has been very helpful for caregiver to make the parents understand about the timely treatment.
   B- Other Paediatric Lesions- MII Ret Cam has been helping globally in imaging other paediatric leisions such as Retinoblastoma etc. (Figure 3).
   C- Imaging up to Pars Plana- MII ret Cam allows retinal imaging up to ora serrata and pars plana which helps retina specialist to convince patients about the prophylactic treatments of peripheral retinal lesion such as holes, lattice etc. Furthermore it can help retina specialist to monitor diseases such as pars planitis and intermediate uveitis with photo documentation.
4. Physicians- MII Ret Cam has been helping physicians specially diabetologists to capture fundus images and send them for opinion/ management to ophthalmologists/ retina specialists at early stages.

REFERENCE

1. Sharma A, Subramaniam SD, Ramachandran KI, Lakshmikanthan C, Krishna S, Sundaramoorthy SK:. Smartphone-based fundus camera device (MII Ret Cam) and technique with ability to image peripheral retina. Eur J Ophthalmol 2016;26:142.

Financial Interest: *Author is the innovator of the device and has financial interest in MII Ret Cam Device which is under patent consideration*

Role of OCT in RCE Diagnosis

Suchi Smitha, Rishi Swarup, Indira

Confocal microscopy has thrown light on the pathology of this problem but is tedious to perform, especially on the already weak epithelium since it is a contact method. With the advent of modern high resolution spectral domain OCT (SD-OCT) it is possible to study the ultrastructure of the corneal surface and look for specific changes during the course of the disease, which may in turn give clues regarding the cause, and guide in the treatment of the condition

Recurrent corneal erosions (RCE) can present at any age and are usually unilateral or can be bilateral and can have various etiologies. Most common causes attributed are trivial trauma with sharp object, epithelial basement membrane disease (EBMD). Though slit lamp biomicroscopy usually shows loose epithelium, black spots on fluorescein staining, map dot patterns, microcysts, it fails to tell us the specific cause or prognosis in most cases. Confocal microscopy has thrown light on the pathology of this problem but is tedious to perform, especially on the already weak epithelium since it is a contact method. With the advent of modern high resolution spectral domain OCT (SD-OCT) it is possible to study the ultrastructure of the corneal surface and look for specific changes during the course of the disease, which may in turn give clues regarding the cause, and guide in the treatment of the condition.

OCT FINDINGS

We describe our findings in a group of patients 14 patients (15 eyes) with RCE on spectral domain anterior segment OCT. Our patients presented with unilateral (n=13) and bilateral (n=1) RCE with underlying cause being trauma in pastand nontraumatic RCE. Slit lamp photography and OCT (RTVue; Optovue, Inc, Fremont, CA) was performed in the acute phase, at presentation and at followup of 3 wk. 2 of 14 cases had central RCE, while the rest had paracentral erosions mostly inferior with typical slit lamp findings of whitish deposits, irregularities of epithelium, epithelial defects and positive fluoresceinstain (Figure 1a,b,c,2a). Treatment included lubricants, Bandage contact lens, PTK in nonresponsive cases. The OCT findings that we typically observed are focal irregular hyper-reflectivity in the epithelium, particularly the basal epithelial layers (Figure 3b,3e,3g), loose and thickened epithelium, gaps in epithelium (Figure 3d), microcysts (Figure 3c) in epithelium. Some cases showed slit like gaps between basal epithelium and bowmans layer (BM) (Figure 3b), showing poor attachment. The BM was largely normal in most cases. Scarring and stromal hyper reflectivity was noted in anterior stroma in some chronic and recurrent cases (Figure 3f).

DISCUSSION

SD-OCT study, confirmed by confocal microscopy in acute and chronic stages of EBDM revealed epithelial abnormalities in most cases mainly an irregular and thickened epithelial basement membrane, duplicating or insinuating into the corneal epithelial layer, and the presence of hyper-reflective dots or sometimes hypo-reflective spaces between the corneal epithelial layer and the Bowman layer. They found that in EBMD the findings on confocal microscopy and SD-OCT were in perfect correlation and thus OCT can be used as an alternative diagnostic tool with the advantage of being a noncontact method in an already weak corneal surface[1].

We found focal irregular hyper-relectivity in basal epithelial layers as a consistent finding in most cases. Confocal microscopy studies have shown brightly reflective granular structures in the basal and wing cell layers of the epithelium and in Bowman's layer along with activated keratocytes in the shallow stroma, infiltration of inflammatory cells in the anterior and mid stroma .These basal epithelial structures could be cell debris and are said to be seen on all stages of RCE, even in the asymptomatic stages[2].

Microcysts within epithelium are said to form due to faulty migration of epithelium over the unhealthy basement membrane. In non trauma related RCE it has been noticed in earlier studies using noncontact photomicrography, that the two opposite migrating epithelial sheets do not close in zipper fashion but form cysts where they oppose, which may in turn lead to epithelial breakdown due to bursting cysts in that area during further proliferation of epithelium.3Findings of microcysts on OCT (Figure 3c) can thus help us to be cautious in such cases and retain bandage contact lens for a longer time.

The underlying pathogenesis of RCE is said to be an abnormal adhesion between the corneal epithelium and stroma. There is some evidence that up-regulated matrixmetalloproteinase activity modulates degeneration of the epithelial anchoring system (lamin in and type VII collagen) that is involved in attaching epithelial basal cells to the underlying basement membrane. Ying-Ting et al found that the epithelium of post-traumatic RCE splits between the basement membrane and the Bowman's layer and that poor epithelial-to-stroma adhesion


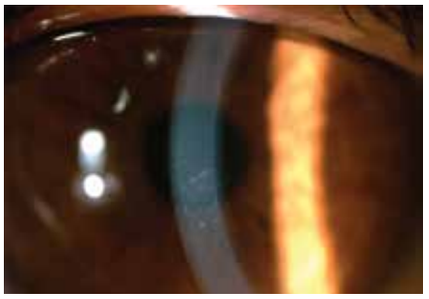
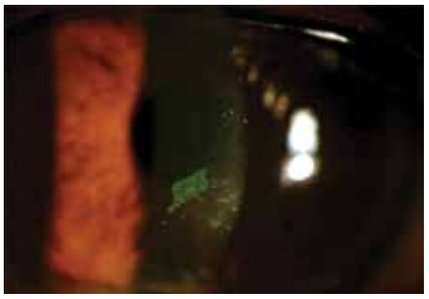

Figure 1a,1b,1c: *Slit lamp photograph of RCE showing map,dot like opacities in the epithelium, loose epithelium*

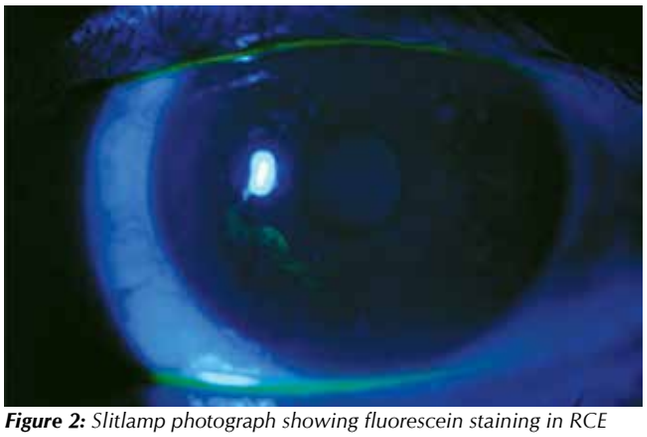

Figure 2: *Slitlamp photograph showing fluorescein staining in RCE*

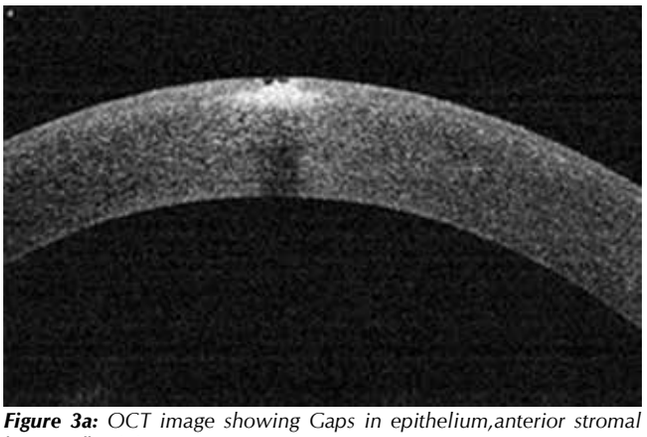

Figure 3a: *OCT image showing Gaps in epithelium,anterior stromal hyper-reflectivity*

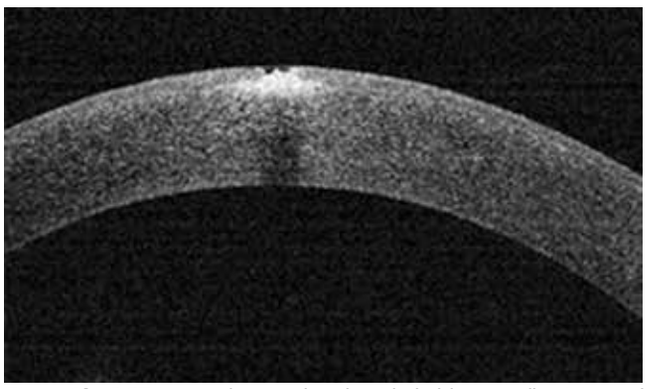

Figure 3b: *OCT image showing basal epithelial hyper reflectivity and slit like gaps between epithelium and Bowman's membrane showing loose epithelium*

Figure 3c: *OCT image in RCE; Microcysts can be seen in the thickened epithelium*

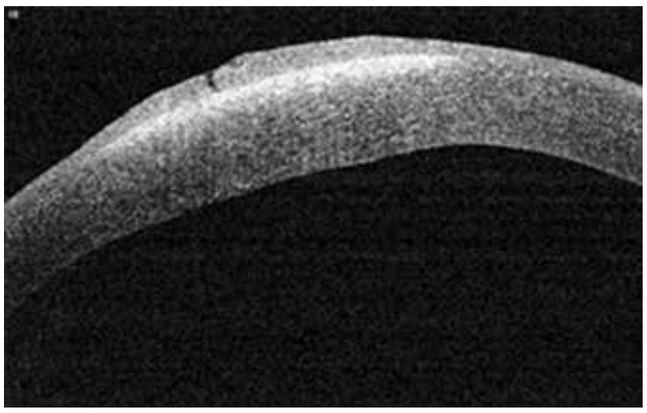

Figure 3d: *OCT image in RCE; Gaps in the epithelium, subepithelial haze in longstanding cases*

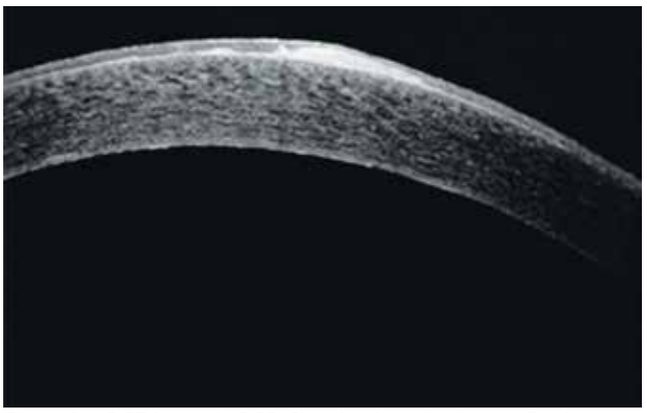

Figure 3e: *OCT image in RCE; Showing irregular hyperreflective areas in basal layers of epithelium,thickened irregular epithelium*

results from poor anchoring of collagen VII fibrils to the Bowman's layer, while hemidesmosomes remained intact. In contrast, non-traumatic RCE is thought to result from a defect of hemidesmosomes. Poor adhesion secondary to these factors may give rise to signs and symptoms of RCE, also the recurrences are more in RCE due to EBDM after PTK[4]. In our case series we found clefts between the epithelium and BM suggesting loose epithelial adhesion in some cases.

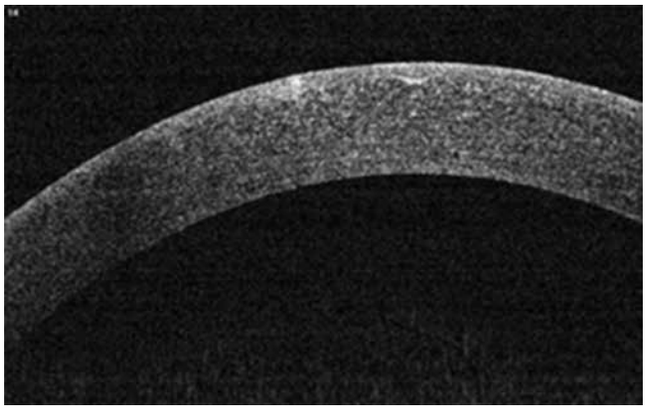

Figure 3f: *OCT image in RCE; Focal hyperreflectivity in basal epithelial layer with area of focal scarring seen in anterior stroma*

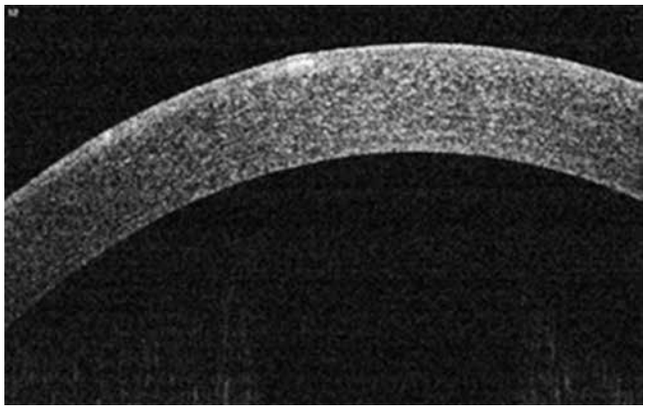

Figure 3g: *OCT image in RCE; Irregularfocalhyperreflectivity in basal epithelial layer of RCE*

Inflammation due to epithelial defects would be expected to result in the activation of keratocytes, which produce matrix metalloproteinases and contribute to haze induction. Stromal scarring in the anterior stroma can be seen due to chronic inflammation in some cases (Figure 3f).

In conclusion, SD-OCT reveals pathological characteristics of RCE to a considerable extent. Although the diagnosis of RCE should be made on the basis of clinical progress and careful examination with a slit lamp bio microscopy, SD-OCT is a useful and convenient tool that can contribute to the diagnosis and guide in management of RCE.

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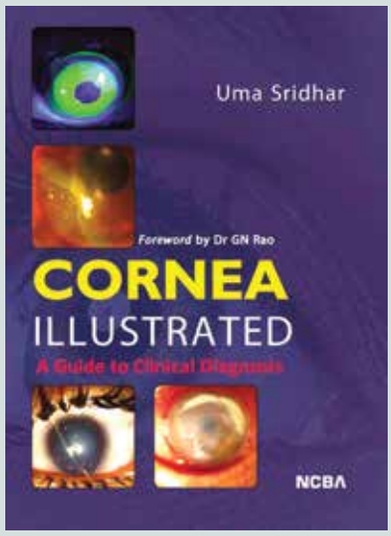
Financial Interest: *The authors do not have any financial interest in any procedure/product mentioned in this manuscript.*

BOOK REVIEW by Dr Radhika Tandon
Professor of Ophthalmology,
Dr R P Centre, AIIMS, New Delhi



Name of the Book

CORNEA
ILLUSTRATED
A GUIDE TO CLINICAL DIAGNOSIS

Name of the Author:

Dr Uma Sridhar

About the Author:

Dr Uma Sridhar is a well known, experienced cornea specialist who, after finishing her training in Ophthalmology, completed her cornea fellowship from the L V Prasad Eye Institute in Hyderabad. She is working as a cornea surgeon at ICARE Noida. She has many years of experience and several publications to her credit.

Publisher

New Central Book Agency (P) Ltd Hyderabad, Ernakulum, Bhubaneswar, New Delhi, Kolkata, Pune, Guwahati.

Description of the Book

The book is hard bound with a foreword written by Dr GN Rao, a dedication, preface, acknowledgements and introduction, contributions from 15 renowned ophthalmologists covering 35 chapters with numerous images ranging from 10 to 90 in number per chapter depending on the topic. Extensive references, have been provided in each chapter ranging from 2 to 100 as per requirement. The book has 537 pages and an index.

The chapters are divided in sections covering various relevant aspects and information is juxtaposed with illustrations, line drawings, histopathpology images, screen snapshots and clinical photographs, check lists, recommended reading lists, tabular formats, ray diagrams, and flow charts.

Appraisal

The book is a well written compilation of all the important aspects of managing corneal disorders covering the diagnosis, differential diagnosis and management with investigations, medical treatment and surgery quite nicely. The book aims to cover the cornea and ocular surface including conjunctival disorders and diseases involving the sclera and is broadly meant for general ophthalmologists. The scope of the book can be considered useful both for ophthalmologists in training and practitioners who wish to update their knowledge and have a handy manual accessible to refer to for atypical cases or less commonly seen disorders. The strength of the book is that it gives a comprehensive coverage of the subject in a simple, easy to follow style supported by extensive examples of corneal diseases which not all students or practitioners may have gotten to see during their training or routine clinical practice. The ample illustrations serve as a very substantial help for memory and understanding. Slightly bulky and heavy, the book is not convenient to carry around for students, but a soft copy in CD is available for portable ease.

All in all the book is useful and would be advisable for purchase for both personal use and institutional libraries.

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Prof Atul Kumar - Dr R P Centre

Dr Harimohan Oration 2017 in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Prof V P Gupta - G.T.B. Hospital

Dr P K Jain Oration 2017 in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Mahipal Singh Sachdev - Centre for Sight

Dr S N Mitter Oration 2017 in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

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Goyal Eye Institute

Dr Bodhraj Sabharwal Trophy for the best DOS monthly clinical meeting 2016 - 2017

Dr S Bharti - Bharti Eye Hospital

Dr Krishna Sohan Singh Trophy for best clinical talk in DOS monthly clinical meeting 2016 - 2017

Dr Sabitabh Kumar - Bharti Eye Hospital

Dr H S Trehan Trophy for best case presentation in DOS monthly clinical meeting 2016 - 2017

Dr Devesh Kumawat & Dr Pranita - Dr R P Centre

Dr V K Kalra Memorial Trophy for DOS Quiz Winners

Dr Uma Sridhar - Icare Hospital

Best guest case presentation in DOS monthly clinical meeting

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Winners - Free Paper Sessions - DOSCON

JOINT WINNERS of Dr A C Agarwal Trophy for best free paper session in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Raghav Ravani - Dr R P Centre

Title-*Intraoperative OCT assisted vitreoretinal surgery with fovea sparing internal limiting membrane peeling for myopic traction maculopathy: our experience*

and

Dr Sumit Monga - Centre for Sight

Title-*Spectacle prescription in children: understanding prevalent practive trends of DOS members*

❖ ❖ ❖ ❖

Dr T P Agarwal Trophy for best free paper Cornea Session – 2 in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Tushar Agarwal - Icare Hospital

Title - *Exvivo culture of mammalian corneal epithelial cells on artificial polymer membrane versus human amniotic membrane*

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Best free paper – Refractive Surgery in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Tushar Grover - Narayana Nethralaya

Title - *A novel inverse finite element approach to analuse corneal biomechanics after SMILE and LASIK*

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Best free paper – Retina in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Prashant Jain - Giridhar Eye Institute, Kochi

Title - *Complex interplay between ocular perfusion pression and choridal thickness in diabetic retinopathy*

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Best free paper – Oculoplasty & Ocular Oncology in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Sima Das - Shroff Charity Eye Hospital

Title - *Factors predictive of treament abandonment and impact of integrated services and neoadjunvant chemotherapy in reducing abandonment in retinoblastoma*

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Best free paper – Cataract in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr R Kavithaa - MN Eye Hospital

Title - *To evaluate the safety and efficacy of new generation extended range of Vision IOL*

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Best free paper – Pediatric Ophthalmology, Strabismus & Neurophthalmology in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Vikas Veerwal - Guru Nank Eye Centre

Title - *Focal Loss Volume (FLV) and Global Loss Volume (GLV) as novel parameters to assess ganglion ceel loss in optic neuritis*

❖ ❖ ❖ ❖

Best free paper – Cornea & Ocular Surface in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Arushi Garg - Narayana Nethralaya

Title - *A novel approach to imaging and analytics of meibomian glands*

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Best free paper – Allied Ophthalmic Sciences in in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Gaganjeet Singh Gujral - Dr Shroff's Charity Eye Hospital

Title - *Evaluation of effect and safety of Dexmedetomidine as a additive to local anaesthesia in peribulbar block for vitreoretinal surgery*

❖ ❖ ❖ ❖

Best free paper – Glaucoma in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Deepti Mittal - Dr R P Centre

Title - *Impact of mediation and yoga based ingervention on quality of life of glaucoma patients: A prospective randomized control study*

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Best Ophthalmic Photography in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Lakshey Dudeja Aravind Eye Hospital, Madurai

Title - *Conjunctival Rhinosporidiosis*

Best E-poster in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Deepali Singhal - Dr R P Centre

Title - *Comparison of Oral Voriconazole Vs Oral Ketoconazole as an Adjunct to Topical Natamycin in Fungal Keratitis: A Randomized Controlled Trial*

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Best E-Video in the 68th Annual conference of DOS – DOSCON 2017: Ophthalmic Spectrum

Dr Shreyas Temkar - Dr R P Centre

Title - *Intralesional Antibiotic Injection in Infectious Subretinal Abscess*

COMPILED ANSWERS FOR DOS TIMES QUIZ

EPISODE-1 (JULY-AUGUST 2016)

1. d. Systemic workup to rule out metastasis is required.
2. b. Blue stimulus on a yellow background
3. d. Cytomegalovirus
4. c. Perifoveal telangiectasia
5. d. 80%
6. d. OIS
7. c. Temperature 21 degree Celsius, relative humidity 40%
8. d. Pseudoexfoliation
9. Oculodigital sign of Franceschetti, Leber congenital amaurosis
10. d. Autofluorescence, pattern RPE dystrophy
11. c. pigment dispersion
12. a. contraction of smooth muscle tissue in the trabecular meshwork
13. c. 1, 2, 4
14. c. Turner syndrome
15. b. amiodarone, anterior capsular cataract

EPISODE-2 (SEPTEMBER-OCTOBER 2016)

1. Adaptive Optics OCT. Photoreceptors
2. Ultrasound Bio-Microscope (UBM). 50 Hz
3. Raindrop implant. Presbyopia correction
4. E.- Well differentiated
5. B.- Cleft palate
6. Retinal astrocytoma. Tuberous sclerosis
7. D.- Syphilis
8. Blepharophimosis (BPES)
9. C.- 20-30% rate of recanalization is expected
10. A.- Are congenital lesions often containing cartilage

EPISODE-3 (NOVEMBER-DECEMBER 2016)

1. Collagen cross linking of cornea. UV-A radiation at 370 nm.
2. Double plate Molteno aqueos shunt. Polyproplylene.
3. 250
4. Undine. Used for irrigation and cleaning of eyes.
5. C.-Eyelid
6. Ocular histoplasmosis (POHS)
7. Pleomorphic adenoma
8. D.- Fraser syndrome
9. A.- Central scotoma
10. B.- Can present with oscillopsia

EPISODE-4 (JANUARY-FEBRUARY 2017)

1. B. Foveal involvement of the white dots
2. E. Type V
3. C. Onset in females is usually before 2 years of age
4. B. Type VIII and Type IV
5. D. Utilizes a 100cd/m2 blue background
6. A. Basal cell carcinoma
7. Coat's disease
8. C. Exotropia in gaze away from the affected eye of a unilateral case can sometimes be seen
9. C. If the patient has ocular myasthenia for 2 years, the conversion rate is about 25-30%
10. D. Sildenafil citrate

EPISODE-5 (MARCH-APRIL 2017)

1. B - Idiopathic juxtafoveal (parafoveal) retinal telangiectasis
2. B - Peak incidence in 3rd decade
3. B - HLA DR 1 association more commonly seen than HLA DR 4
4. D - Most commonly lower lid is affected
5. B - Chaismal area
6. C - Damage to the pontine gaze centres
7. B - Peripheral neuropathy
8. C - Distichiasis
9. D - Masseter muscle
10. C - Chen's media – 7-10 days

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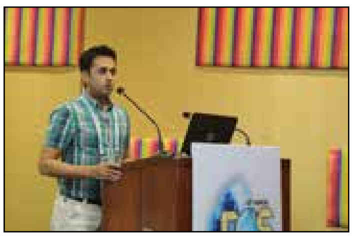

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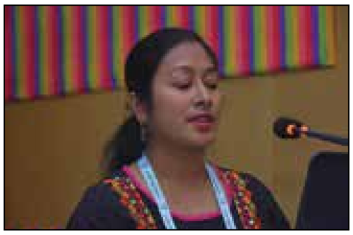























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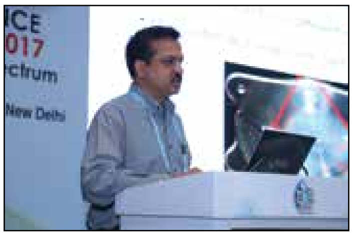













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