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Our dilemmas ..... our dreams ...

There remain a basic dilemma in the heart of the author. The author in this situation is invariably a budding young ophthalmologist who started practicing Ophthalmology only over the last few years. After a whole day's labourious clinics and surgeries, he sits down to prepare his paper for the upcoming annual conference. Thereafter, once being adjudged to be the best paper in the conference, he becomes legally bound to submit his original article in the Bengal Ophthalmic Journal. Here starts the dilemma. The dilemma of submitting his labourious hard work with innovative conclusions to be compulsorily being published in a non-peer-reviewed journal of the Society. The young author dreamt of publishing the same article in a peer-reviewed national or even an international journal, the readership of which is perhaps more far-flung and thought-incipiting. His dreams are genuine and acceptable. The compulsions are there over the decades together.

The plight of the scientific journal is even more precarious. The nature of the journal being non-peer-reviewed, it fails to persuade authors to submit their best possible original article in the journal. If the best papers from the annual conferences are also not being included, the standards will tend to drop down furthermore. The publication then will be more of a farce, or an eye-wash.

In order to strike a matching balance between these two dilemmas, we need to upgrade ourselves on two different fronts. First and foremost, we should strive to upgrade ourselves to be a peer-reviewed journal. Our Society need to take this up as an important agenda, as the journal is said to be the scientific face of the Society. This upgradation would require some definite steps over a span of few years.

Second but not the least, each individual member should be prepared to submit their best possible article in the journal. A concerted effort by the members would definitely improve the quality and quantity of the publications, even publishing more than one volume annually, maintaining excellent standard over a prolonged period.

We look forward for a bright future not only for our Society, but also for our journal. The two has to go ahead in tandem in perfect co-ordination to achieve greater heights.

Debashis Das
Editor, Bengal Ophthalmic Journal.

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Infectious Keratitis: A Review

Shaji Hussain1,2, Aditi Johri1, Srinivas K Rao1

Abstract: Infectious keratitis is an important problem in the Indian context, and epidemiological studies suggest a higher prevalence of disease as compared to the developed world. Various aspects of the problem, including the host defence, ocular and systemic risk factors and microbial mechanisms that enhance pathogenesis have been discussed. The clinical and microbiological approach to the infected eye and patient and the relevant tests have been outlined. The major classes of medications that are used and the methods of delivery are specified. Finally, the approach to patients with non-responsive keratitis that requires surgical manoeuvres is also highlighted.

Key words: Infectious keratitis, corneal ulcer, corneal drawings.

Current Epidemiology of Infections

The epidemiology of blindness in the recent years has shifted to important causes, such as cataract, corneal trauma and infective keratitis1 from traditional infectious causes, such as trachoma, onchocerciasis and leprosy. The epidemiology of corneal disease is a complicated affair as it encompasses a wide variety of infectious and inflammatory eye diseases and hence still remain only second to cataract, among the major causes of blindness in the world. In addition, depending on many factors, such as availability and general standards of eye care, the prevalence of corneal blindness varies from country to country and even from one population to another.2 For instance, the most common cause of monocular blindness in many regions of Africa are corneal diseases, especially corneal ulceration. A case-control study by Lewallen & Courtright demonstrated that there is a significant association between the use of traditional eye medicines and corneal ulceration, especially peripheral ulceration, which is common in these communities.

Corneal scarring due to corneal diseases is also a common cause of monocular and bilateral blindness in children and young adults. In high-risk groups, the incidence of childhood cornea-related visual loss is 20-times higher in some parts of Africa and Asia, than in industrialized countries. In a hospital-based study in north-west Cambodia, where cataract was found to be the main cause of blindness in adults (59%), children were more commonly blinded by corneal scarring (40%).4

Recently corneal ulceration in developing countries has been recognized as a “silent epidemic”5. In 1996 Gonzales et al. found that the annual incidence of corneal ulceration in Madurai District in South India was 113 per 1 lakh people6, 10 times the annual incidence of 11 per 1 lakh reported from Olmsted County, Minnesota, in the United States of America.7 By applying the 1996 corneal ulcer incidence rate in Madurai District to all of India, there are an estimated 840000 people a year in the country who develop an ulcer. This figure is 30 times the number of corneal ulcers seen in the United States.8 Extrapolating the Indian estimates further to the rest of Africa and Asia, the number of corneal ulcers occurring annually in the developing world quickly approaches 1.5–2 million, and the actual number is probably greater.

There is a preliminary report of significance from Madurai that 44% of all central corneal ulcers are caused by fungi.9 This high prevalence of fungal pathogens in south India is significantly greater than that found in similar studies in Nepal (17%),9 Bangladesh (36%),9 and south Florida (35%).10 It is essential to determine the local aetiology within a given region when planning a corneal ulcer management strategy. The most common cause for bacterial keratitis is known to be Streptococcus pneumoniae based on various studies done.9 With regard to fungal keratitis the strain causing infection varies between the south and north of India. In the south, of the 155 fungal isolates cultured from 154 corneal ulcers 47.1% were Fusarium species, and 16.1% were Aspergillus species.11 In another study from south India, Fusarium(306, 37.2%) and Aspergillus species (417, 30.7%) among the hyaline fungal spectrum and Curvularia species (39, 2.8%) among the dematiaceous isolates, were the predominant organisms seen.12

Whereas in North India, the spectrum of fungi isolated were Aspergillus species in 78 (41%) followed by Curvularia species in 55 (29%).11 In another study, Aspergillus flavus was the most common fungus isolated in 31.16 per cent cases, followed by A. fumigatus (16.88%) and Fusarium spp. (7.79%). Yeasts were also isolated in 21.62 percent cases.13

Ocular surface defence - Normal protective mechanisms

Unlike all other wet-surfaced epithelia of the body, the ocular surface is directly exposed to the outside world where it is especially subject to desiccation, injury and pathogens. As a consequence, numerous protective mechanisms are present in the Ocular Surface System to ensure corneal integrity. When a pathogen begins to
invade, the first barrier is the tear-epithelial cell interface which has a hydrophilic, heavily glycosylated glycocalyx (formed from membrane associated mucin) and human specific antibody H185 on the apical surface membranes of the epithelia. The epithelium also provides protection by healing quickly, adhering tenaciously to underlying connective tissue and secreting cytokines interleukin IL-1α. Tears flush foreign particles from the ocular surface, and transport antimicrobial proteins (lactoferrin, lysozyme, lipocalin, and beta-lysin) and immunoglobulin A to the ocular surface to prevent infections. In the superficial stroma, keratocytes secrete IL-1α, TNFα and Defensins.

Types of Corneal Infections

BACTERIAL KERATITIS progress rapidly with patient’s complaining of rapid onset of pain, photophobia, and decreased vision. The most common groups of bacteria responsible for bacterial keratitis are: Streptococcus Pneumonia, Pseudomonas, Enterobacteriaceae (including Klebsiella, Enterobacter, Serratia and Proteus), and Staphylococcus species. Up to 20% of cases of fungal keratitis (particularly candidiasis) are complicated by bacterial co-infection. Acute pain with watering and rapidly spreading corneal ulcer is likely to be due to Pseudomonas aeruginosa and Streptococcus pneumoniae.

The ulcer usually present with severe conjunctival congestion, epithelial defect, distinct margins, wet slimy surface, mucopurulent discharge, stromal inflammation with infiltrates and suppuration, DM folds, severe AC reaction, synechiae, hypopyon (occurs as a reaction to the released exotoxins which is usually sterile with fluid like consistency and is mobile). Hypopyon is also an important sign of Pneumococcal or Pseudomonas ulcer. Haemorrhagic hypopyon is associated with pneumococcal or Herpes simplex keratitis.

Gram Positive Cocci are white discrete stromal infiltrates with minimal haze forming small abscess like lesions. Staphylococcus is seen in compromised eyes with bullous keratopathy and in chronic herpetic keratitis. Pneumococci have a progressive edge with other edge healing.

Gram Negative Bacilli are rapid and corneal destruction may be complete in 24-48 hours. Pseudomonas causes severe inflammation, greenish discharge, marked corneal melt, ring infiltrates, surrounding stroma has ground glass appearance, diffuse greying of epithelium.

The characteristics of Atypical bacteria are:

Mycobacteria presents with a cracked wind shield appearance with spoke like margins. Its often seen in post Lasik eyes and heals slowly. Nocardia occurs from minor trauma or exposure to soil. It has multiple, raised, superficial, white small pin head, wreathe like infiltrates with small filaments and bush-fire like borders. Bacillus is a gram positive Bacilli occurring post trauma commonly in broom stick injury, with rapid aggressive peripheral stromal abscess. The following ring ulcer is distinct stromal infiltrate remote from area of trauma. Moraxella which is a gram negative diplo bacilli, occurs in malnourished, diabetics and alcoholics. They are superficial with moderate oedema and minimal infiltrates.
FUNGAL KERATITIS is characterised by insidious onset with an indolent course. Mainly caused by yeast (mainly candida) and filamentous (septate and nonseptate) fungi. Fungal organisms usually extend from mid periphery to the centre of cornea or can even extend from the cornea into the sclera and intraocular structures. Filamentary Fungi present with an epithelial defect, infiltrate with hyphae feathery ill defined edges, elevated and dry surface with rough texture, greyish white appearance. Presence of brown pigmentation, satellite lesions and ring like infiltrates are other characteristic findings. Hypopyon (contains fungal filaments, thick, immobile), stromal abscess, yellow immune ring and endothelial plaque are also seen. Candida may resemble staphylococcal, Moraxella ulcers, Stromal herpes and other low virulent bacterial ulcers.

VIRAL KERATITIS is the most common cause of infectious blindness in the Western world. Patient usually present with photophobia, redness and watering. Mainly caused by Herpes Simplex Virus type 1, Herpes Zoster Virus and Adenovirus.

Herpes Simplex Virus: Primary herpes infection of the eye, usually unilateral blepharoconjunctivitis with characteristic vesicles on the skin of the lids, follicular conjunctivitis, preauricular lymphadenopathy, and occasional punctate keratitis. After primary infection, recurrence rates of Herpes simplex keratitis (HSK) are about 25 percent within 1 year and 33 percent within 2 years and 63% in 20 yrs. Earliest signs are raised SPK, MACRO DENDRITIC ulcers (commonest presentation, linear branching pattern with terminal bulbs, swollen epithelial borders that contain live viruses, and central ulceration through the basement membrane taking double stain), sensation reduced. GEOGRAPHIC ulcer - broad epithelial defect wherein borders are scalloped, irregular and angulated. MARGINAL ulcer - dendrite develops close to the limbus, its anterior stroma gets infiltrated by leukocytes from the limbal blood vessels. METAHERPETIC/ Persistent Epithelial Defect-occurs due to damaged basement membrane, antiviral toxicity or neurotrophic component. Its characterised by heaped up edges, smooth ovoid contour, irregular corneal surface, located in the central or inferior paracentral area, and usually lies within the interpalpebral fissures. STROMAL KERATITIS can be primary or secondary (to infectious epithelial keratitis, neurotrophic keratopathy, or endotheliitis). Two forms are Necrotizing Stromal Keratitis and Immune Stromal Keratitis. Necrotizing Stromal Keratitis presents with dense stromal infiltrate, ulceration and necrosis (viral replication occurs within stromal keratocytes resulting in severe host inflammatory response) which usually results in thinning and perforation within a short period. It is usually a diagnosis of exclusion from fungal/bacterial/ Acanthamoeba keratitis/retained FB/drain toxicity. Immune Stromal Keratitis (ISK), also known as Nonnecrotizing Stromal Keratitis and Stromal Interstitial or Disciform Keratitis, is a manifestation of chronic, recurrent ocular HSV disease. ISK may clinically present with focal, multifocal, or diffuse cellular infiltrates which may obscure the underlying endothelium, Wessley immune rings appear as granular greyish ring formed by antibody complement cascade. Recurrent viral infection are characterised by neovascularisation, ghost vessels or scarring. ENDOTHELITIS present with keratic precipitates (KP), minimal iritis, endothelial guttate, oedema of overlying stroma and epithelium without stromal infiltrate or neovascularisation. It can be classified as Disciform Endotheliitis and Diffuse Endotheliitis. Disciform Endotheliitis present with corneal oedema in a central or paracentral region with a clear demarcation between involved and uninvolved cornea. Always assess the iris for segmental ischaemic necrosis which may occur with or without trabeculitis that may cause a secondary IOP rise. Varicella Zoster: Herpes zoster ophthalmicus (HZO) occurs when reactivation of the latent virus in the trigeminal ganglia involves the ophthalmic division of the nerve. 20% of primary infection reactivates. The virus damages the eye and surrounding structures by secondary perineural and intraneural inflammation of sensory nerves. The prodromal phase of herpes zoster ophthalmicus includes an influenza-like illness with fatigue, malaise, and low-grade fever that lasts for a week, before the rash over the forehead appears, along with varying degrees of dermatomal pain. Subsequently, erythematous macular lesion rapidly progress to papules and vesicles containing clear serous fluid and later, pustules. These lesions rupture and typically crust over, requiring several weeks to heal completely. They strictly occur on one side of the midline. They present with follicular conjunctivitis and blepharitis. Corneal complications occur in 40 percent of cases of HZO. Corneal presentation include subepithelial punctate keratitis, Pseudo-dendrites (which are multiple, smaller with tapered ends, without bulbs and central ulceration occurring mainly at periphery), multiple superficial stromal nummular fine infiltrates, deep stromal infiltrates with lipid and vascular infiltration. Severe cases may also present with uveitis, ARN, PORN, optic neuritis, EOM palsies.

Adenovirus: In the first week usually present with conjunctivitis, pseudomembrane, preauricular lymphadenopathy and dryness due to lacrimal gland inflammation. Second week corneal involvement may occur with diffuse, fine punctuate epithelial keratitis (PEK) that stains with fluorescein and rose bengal. Third week, immune reaction takes over with subepithelial keratopathy and the viral penetration and inflammation is only up to the Bowman’s layer. It usually persists for 2-3 weeks. Corneal sensations are normal.

Parasitic Infections

Acanthamoeba Keratitis is now often reported with much frequency due to increased use of contact lens wearers. Exposure to muddy or brackish water is also important predisposing factors. It’s more significant among the infectious category because of the delay in its diagnosis. This has a cyst form (dormant) and a trophozoite form (active). Bacteria and fungi sometimes coat the surface of the trophozoite that may result in a mixed infection. Acanthamoeba binds through mannose glycoprotein of corneal epithelium and secretes proteins which are cytolitic to the epithelium and proteases that help in further penetration. Its characterised by pain disproportionate to signs, radial keratoneuritis, mid peripheral
stromal ring infiltrate with intact epithelium, satellite lesions and pseudodendrites. This may also be associated with scleritis or limbitis. High degree of suspicion should occur, especially in a young contact lens wearer with a recent diagnosis of keratitis, who is not responding to therapy. Steroids should never be instilled even on resolution, as it may convert trophozoite form to cystic form which may activate later.

Microsporidia are obligate intracellular eukaryotic pathogens known to cause superficial punctate keratitis and stromal keratitis in both immune compromised and immune competent individuals. They have been recently reclassified as fungi. Microsporidial keratitis is suspected when an SPK responds but later recurs on tapering steroids. Microscopic examination of a diagnostic epithelial scraping reveals aggregates of intracellular organisms in the cytoplasm of epithelial cells consistent with microsporidia. Steroid use should be discontinued, and resume treatment with topical voriconazole 1%, every 2 hours.

**Importance of detailed drawings**

Standardised schematic representation of corneal disorders is essential for proper follow up of patients, and also for clinical research. It improves clinician’s focus and treatment skills. It may come in handy during medico legal issues. Following colour coding is generally used to document the findings of anterior segment.

- **Brown:** Pupil, Pigmentation, iron, melanin and iris defects.
- **Red:** Blood vessels, Rose Bengal staining, Haemorrhages.
- **Orange:** Hypopyon, Keratic precipitates.
- **Green:** Fluorescein staining of cornea, Punctuate epithelial keratopathy (dots), Filaments (small lines), Epithelial defects, Lens and vitreous haze.

**Assessment of Healing**

Healing ulcer is characterised by re-epithelisation, blunting of the hyphate edges, decrease in stromal infiltrates, decrease in stromal oedema and endothelial plaque, cessation of corneal thinning, decrease in the anterior chamber reaction, height and surface of hypopyon. If the ulcer is not healing then advice for recapture to confirm initial diagnosis, recheck the corneal structures, repeat blood sugar levels. We might as well initiate alternative treatment modalities like intrastromal, intracameral or subconjunctival antimicrobial therapy.

Surgery is warranted in case of perforated corneal ulcer, impending perforation, if ulcer is not healing in spite of appropriate and adequate therapy for 1 week, fulminant ulcer that’s not showing any response in three days, a slow healing ulcer for 1 month.

**DIAGNOSIS - Microbiology**

**Routine scrape:** Topical anaesthesia, avoid contamination while collecting sample, place wire speculum, clean superficial debris, scrape from the base and leading edge of ulcer, avoid thin necrotic areas, direction should only be towards one side.

<table>
<thead>
<tr>
<th>Stain</th>
<th>Organism</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grams</td>
<td>Bacteria, Fungi, Acanthamoeba, Microsporidia</td>
<td></td>
</tr>
<tr>
<td>Giemsa</td>
<td>Bacteria, Fungi, Acanthamoeba, Microsporidia, Chlamydial inclusions</td>
<td></td>
</tr>
<tr>
<td>10% KOH</td>
<td>Fungi</td>
<td>Corneal tissue completely digested by KOH</td>
</tr>
<tr>
<td>Periodic Acid Schiff</td>
<td>Fungi</td>
<td>Fungal elements take up Magenta colour</td>
</tr>
<tr>
<td>Gomori Methenamine Silver</td>
<td>Fungi</td>
<td>Fungal filaments seen in black colour against light green background.</td>
</tr>
<tr>
<td>Calco Flour White</td>
<td>Fungi, Acanthamoeba</td>
<td>Observed under fluorescent microscope</td>
</tr>
<tr>
<td>Ziehl Nielsen</td>
<td>Mycobacteria, Nocardia</td>
<td></td>
</tr>
<tr>
<td>Immunoflorescent Staining</td>
<td>Virus, Chlamydia</td>
<td></td>
</tr>
<tr>
<td>Acridine Orange</td>
<td>Bacteria, Fungi, Acanthamoeba,</td>
<td></td>
</tr>
<tr>
<td>Cold Carbol Fuchsin</td>
<td>Nocardia</td>
<td></td>
</tr>
</tbody>
</table>
Corneal biopsy - should include an adequate area of cornea affected clinically. Corneal button - The trephined corneal button in therapeutic PK is sent to Microbiology Laboratory in a sterile container immediately. The corneal tissues are then cut into small pieces in a small sterile petridish and inoculated onto various culture media.

<table>
<thead>
<tr>
<th>Culture Media</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Agar</td>
<td>Aerobic Bacteria, Saprophytic Fungi</td>
</tr>
<tr>
<td>Chocolate Agar</td>
<td>Haemophilus, Neisseria, Moraxella, 37° for Bacteria, Room temp. for Fungi</td>
</tr>
<tr>
<td>Brain Heart Infusion Broth</td>
<td>Bacteria, Fungi</td>
</tr>
<tr>
<td>Sabouraud's Dextrose Agar</td>
<td>Fungi</td>
</tr>
<tr>
<td>Thioglycolate Broth</td>
<td>Anaerobic And Aerobic Bacteria</td>
</tr>
<tr>
<td>Lowenstein Jensen Agar</td>
<td>Atypical Mycobacteria</td>
</tr>
<tr>
<td>E.Coli Plated Non Nutrient Agar</td>
<td>Acanthamoeba</td>
</tr>
</tbody>
</table>

If the ulcer is primary, small, peripheral or non virulent, then scraping need not be done. It can also be delayed if the clinician is experienced or if the ulcer is responding. Else it is warranted if corneal infiltration is large, infiltrates extend deep into stroma, has a chronic nature, no response to treatment or has typical features of fungal, amoebic or mycobacteria keratitis.
Clinical Features

INFECTIOUS: Usually has a traumatic onset, slow to fast progressing, minimal to severely symptomatic with sharp aching pain. Conjunctival and ciliary hyperaemia with lid oedema and discharge are present. Ulcers are central or superior, more than 1 mm and superficial to deep with epithelial defect, swollen edges, dry/wet surface. It may also present with pseudo guttate, DM folds and endothelial plaque. They are usually associated minimal to marked AC reaction, KP’s and hypopyon.

INFLAMMATORY: Usually due to contact lens, dryness, OSD, immune systemic diseases with a slow progress, symptomatic with FB sensation. There is minimal conjunctival congestion, with ciliary hyperaemia. Infiltrates are peripheral, less than 1 mm, single/multiple, well defined, subepithelial or in superficial stromal. Lucid interval is present between limbus and infiltrates. There is minimal AC reaction with or without hypopyon.

Microbiology ensures confidence in treatment regimen, can handle medico-legal issues, with respect to completion of documentation, get drug sensitivity of organisms and also on academic interest.

Treatment

Specific medications

<table>
<thead>
<tr>
<th>ORGANISM</th>
<th>STRAIN</th>
<th>TOPICAL DRUG</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACTERIA</td>
<td>Gram Positive Cocci</td>
<td>Moxifloxacin/Gatifloxacin</td>
</tr>
<tr>
<td></td>
<td>Gram Negative Bacilli</td>
<td>Cefazolin (50 mg/ml)*</td>
</tr>
<tr>
<td></td>
<td>Atypical</td>
<td>Amikacin (20 mg in 0.5 ml)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceftazidime (50 mg/ml)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amikacin (20 mg in 0.5 ml)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moxifloxacin/Gatifloxacin</td>
</tr>
<tr>
<td>FUNGAL</td>
<td>Filamentary- South- Fusarium</td>
<td>Amphotericin B (0.15%)</td>
</tr>
<tr>
<td></td>
<td>Filamentary - North- Aspergillus</td>
<td>Voriconazole/ Natamycin</td>
</tr>
<tr>
<td></td>
<td>Candida</td>
<td>Amphotericin B (0.15%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fluconazole</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tab Fluconazole 150 bd</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>Tear substitutes q 1 H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vigamox2/d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluoromethalone e/d 3/d tapered in 5 days</td>
<td></td>
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<tr>
<td></td>
<td>Oral Diclofenac bd x 3 days</td>
<td></td>
</tr>
<tr>
<td>Herpes Simplex Virus</td>
<td>Tear substitutes</td>
<td></td>
</tr>
<tr>
<td>Metaherpetic / PED</td>
<td>Stop all medications</td>
<td></td>
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<tr>
<td></td>
<td>Preservative free Tear substitutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Punctal plugs / BCL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluoromethalone 3/D tapered weekly</td>
<td></td>
</tr>
</tbody>
</table>
General Principles

1. In general reduce frequency of drops by half.
2. Avoid fortified ABs if frequency < 6 times.
3. Use medicines only as required.
4. Monitor carefully for medication toxicity.
5. Add steroids when appropriate to modulate healing.
6. Stopping treatment can sometimes take months.
7. Patching - best avoided, even in ABRASIONS.
8. Subconjunctival injections - Only if poor compliance.
10. Oral Antimicrobials – given in scleral, limbal or intraocular infections.
11. Grade infection as “better”, “worse”, or “stable” on follow ups.
12. Quick surgical intervention is required if infection is worsening.
13. Surgical adjuncts often needed in fungal keratitis.
14. Oral Acyclovir 400 mg b.d to be given prior to patients undergoing TPK in herpetic scar.

Management of associated conditions / risk factors

1. Treat sugar level in high diabetics.
2. Treat associated dacryocystitis.
3. Adjunct with antibiotic in a fungal infections.
4. Stop contact lens.

Other medications

1. Cycloplegics- atropine e/d b.d – relieves pain due to ciliary spasm, prevents synaechiae, brings more antibodies to aqueous humor and reduces exudation.
2. Topical steroids: prescribed after resolution of infection is ensured, helps to avoid scarring.
4. Vitamin C helps in collagen synthesis.
5. Anti-glaucoma-if pressures are high-Tab Acetazolamide ½ tab t.i.d.

Adjunctive measures

1. Epithelial debridement in fungal keratitis helps in better penetration of the drug.
2. Patching not advisable as it can exaggerate infection.
3. Cauterization with Betadine can destroy tissues.
4. Subconjunctival/intra stromal /intra cameral antimicrobials – if the ulcer is slow healing/ not responding to topical medications.
5. In impending perforation-avoid strain, decrease IOP, glue BCL, TPK.
Surgical management

Glue BCL – Ulcer should be located away from the limbus. Cyanoacrylate glue is bacteriostatic and longer lasting than fibrin glue. It is also believed to inhibit polymorphonuclear lymphocytes and the production of collagenases, which may halt the corneal melting process.

1. With perforation (<2 mm) – Debride surface and surrounding unhealthy epithelium, form chamber with air (30 G), place speck of methacrylate glue on surface, let dry, instill Vigamox e/d, place BCL.
2. Impending perforation - Debride surface and surrounding unhealthy epithelium, place speck of methacrylate glue on surface, let dry, instill Vigamox e/d, place BCL.
3. Post procedure patient should be on Vigamox 2/d and Flurometholone 1/d until glue falls off. If glue doesn’t fall in 3 months then it is mechanically debrided in OR.

Intracameral / Intrastromal injections

1. Intra stromal: One or more Intrastromal injection of antimicrobials at the junction of clear cornea and infiltrates, using a 30-gauge needle in five quadrants to form a barrage around the ulcer.
   a. Voriconazole 5%(50 μg in 0.1 ml)
   b. Fluconazole 0.2% (2 μg in 0.1 ml)
   c. Ampho B 0.7% (7.5 μg in 0.1 ml)
2. Intra cameral : injections of antimicrobial through a paracentesis
   a. Voriconazole 5%(50 μg in 0.1 ml)
   b. Fluconazole 0.2% (2 μg in 0.1 ml)
   c. Ampho B 1% (10 μg in 0.1 ml)

Patch grafts

Corneal patch grafts, either lamellar or full-thickness, can be used temporarily for central corneal perforations (> 3 mm) or permanently for peripheral corneal perforations or descemetocoeles. Ideally, all necrotic tissues and epithelium are removed from the bed of the ulcer or margins of the corneal perforation until a viable tissue is reached before a lamellar disc of donor cornea or patch graft is sutured in place with interrupted 10-0 nylon sutures.

Lamellar Grafts

Lamellar keratoplasty virtually eliminates the risk of graft rejection. But the disadvantages of lamellar keratoplasty are intralamellar neovascularisation and incomplete removal of pathogens. Lamellar keratoplasty has been performed for Acanthamoeba, fungal, herpetic, post-laser in-situ keratomileusis (LASIK) Mycobacterial keratitis, post Gonococcal keratitis, descemetocoeles and graft infection.

Therapeutic Penetrating Keratoplasty

The primary aim of the procedure is to eliminate the infectious disease process and establish the integrity of the globe. This procedure offers a microbiological cure rate of upto 100% in bacterial keratitis; recurrence of infection remains a concern following fungal, viral and Acanthamoebic keratitis. Indicated when ulcer does not respond despite the maximum therapy applied.

Examination is necessary to value the following points:
   a. Evaluate the size, depth and location of the infiltrate or corneal ulcer.
   b. If the limbus is compromised, trephination should include the involved rim.
   c. Evaluate the posterior pole under dilation, if not possible, advice a B Scan ultrasound.
   d. In cases of poor vision assess PL, PR, RAPD, Red - Green Appreciation.
   e. Ideal not to touch the cataractous lens during TPK.
   f. Soft eye is essential during surgery: Assess the IOP pre operatively and advise IV Mannitol pre operatively which can also reduces vitreous volume.
   g. In eyes with a crystalline lens or posterior chamber intraocular lens, and patients with iris incarcerated in a wound, give Pilocarpine 2% 1 hour prior to surgery, to protect the lens, and maintain a posterior lens-iris diaphragm.
   h. It is much better to perform it under general anaesthesia than local anaesthesia and in all cases we must maintain the arterial pressure under control to reduce the risk of expulsive choroid haemorrhage, especially in those patients with perforation.

Donor material:
   a. Corneal tissue of excellent grade offers the following advantages:
      i. Healthy tissue with intact epithelium minimizes the risk of re-infection in the graft.
      ii. Healthy endothelium is critical for the survival of the graft.
      iii. Compact and clear tissue helps in monitoring anterior chamber reaction during the immediate postoperative period.

During the TPK
   a. Place the appropriate trephine over the cornea and create an indentation in the epithelium.
   b. Use lid speculum.
   c. Suture a Fleringa ring in place to provide scleral support.
d. In cases of large ulcers that reach up to the limbus, peritomy is required and homeostasis is achieved by the use of wet-field cautery.

e. If possible, a 1 mm rim of healthy corneal tissue should also be removed to leave a stable, not infected recipient bed.

f. Careful partial-thickness trephination with a Sharp trephine is done in the absence of any perforation.

g. In eyes with a perforation, i. Support is obtained with cyanocrylate and viscoelastic protection and anterior chamber can be reformed, care should be taken to avoid exerting excessive pressure on the globe to prevent extrusion of the ocular contents.

ii. A freehand dissection of the host bed may be done.

h. Clearing the anterior chamber of exudates i. Irrigation of the anterior chamber is done using a medicated balanced salt solution.

ii. Removal of cataracts should be deferred because the lens forms an effective barrier that prevents the spread of infection into the vitreous.

i. Donor button should be trephined after the size of the recipient opening is measured and preparation of the host bed, because necrotic tissue may require additional trimming which may alter the size of the graft.

Sutting by 10-0 monofilament Nylon interrupted sutures passing through at least 70% depth of the host cornea is the preferred technique. Full thickness bites are not taken as they may form a conduit for passage of infection from the cornea into the anterior chamber. It is not uncommon to use greater number of sutures than conventional technique of keratoplasty (16 Sutures). 37, 38

Fungal keratitis.

- **Topical antifungals**: Every hour initially continue for 8-12 weeks.
- **Systemic antifungals**: Oral Itraconazole 200 mg two times daily continues for 2-6 weeks.
- **Corticosteroids**: Only under extremely special conditions. Given judiciously.
- **Cyclosporine**: Topical drops 0.5%
- **Cycloplegics**: Recommended to ciliary spasm and prevent synaechiae.
- **Antiglaucoma medication**: If intraocular pressure is elevated (avoid pilocarpine, prostaglandin analogues).
- **Tears substitutes**: Frequent instillation is recommended to hasten re-epithelization.

Acanthamoeba keratitis.

- **Topical amoebicidal**: Drugs - every 1 to 2 hours.
- **Systemic antifungal**: Oral Itraconazole 200 mg two times daily.
- **Topical Corticosteroids**: Given judiciously.
- **Cycloplegics**: Recommended to ciliary spasm and prevent synaechiae.
- **Antiglaucoma medication**: If intraocular pressure is elevated (avoid pilocarpine, prostaglandin analogues).
- **Tears substitutes**: Frequent instillation is recommended to hasten re-epithelization.

j. Evisceration / Enucleation: Corneal ulcers that result in the loss of eye in elderly population:

i. Are frequently associated with glaucoma and persistent epithelial defects.

ii. The majority of these cases have non-healing microbial keratitis caused by pseudomonas aeruginosa.

iii. Present late to clinic.

iv. Suffer from long standing severe pre-existing ocular disease due to systemic associations like rheumatoid arthritis.

Role of steroids

Topical steroids with antiviral agents reduce progression of viral stromal keratitis and shorten duration. Helps to prevent scarring, neovascularisation, relieve pain and restore vision.

a. In bacterial keratitis, can be given early after infection is controlled, to bring down the inflammation.
b. In fungal and viral keratitis avoid steroids except in stromal viral keratitis.
c. Post TPKs start steroid after 1 week in bacterial cause and after two weeks in fungal. In viral etiology it can started immediately under Oral Acyclovir cover.40

Conclusions
Corneal ulcers from an important part of the disease spectrum seen by the ophthalmologists in India, not just because of its prevalence, but also because of the severe ocular morbidity that occurs when managed inappropriately. This article addresses some important aspects of those problems. Following the principles described can result in good outcomes in the majority of patient with infectious keratitis.

References
29. AAO Basic and Clinical Science Course. External Disease and Cornea; 2005-2006; 134-45.
Cytokines are regulatory proteins produced by cells in different organs in response to a variety of inducing stimuli and play a crucial role in inflammatory process. Their role in the pathogenesis of intraocular inflammation was extensively investigated by analysing aqueous or vitreous samples taken from uveitis patients for diagnostic or therapeutic purposes. Biologicals are a group of biologically active proteins and monoclonal antibodies, directed against one specific cytokine, one specific type of inflammatory cell or one specific cell surface receptor. This short review discusses the basic principles and immunological aspects of these monoclonal antibodies and fusion proteins, used for the treatment of intraocular inflammation.

Keywords: Biologicals, Uveitis, Cytokines, Fusion proteins.

Over the years with better understanding of the immune systems and a holistic approach to a variety of tools and technologies, various newer medications have been developed to treat various diseases like cancer, systemic rheumatic diseases etc. Similarly various new immunomodulatory agents have been tried in the management of uveitis and intraocular inflammation also. Undoubtedly biologicals are one of them. These groups of drugs were introduced as an alternative therapy for refractory cases of uveitis about 15 years ago. They are also termed as immunotherapy or biotherapy, biologic response modifiers etc. Most of these agents are primarily monoclonal antibodies or fusion proteins produced with the help of recombinant technology. Detailed discussions on the immunological aspects of these particles are beyond the scope of this article; however few salient points on cytokine, monoclonal antibodies and fusion proteins will be useful for better orientation.

Cytokines and intraocular inflammations:

During inflammatory and immune processes, multiple chemical mediators are released from the local tissue and immune cells. Among them cytokines play a crucial role in inflammatory process. Cytokines are regulatory proteins produced by cells in different organs in response to a variety of inducing stimuli. Normally, concentration of cytokines in body fluids is mainly in the picogram range, although their concentration at the site of action may be much higher since most cytokines display their activity in the direct vicinity of their cellular source. Cytokines are pleiotropic (one cytokine may have many different functions) and redundant (many cytokines have overlapping activities) in nature. Cytokines play an essential role in deciding which types of lymphocytes or antibody classes will be involved in the immune defense. Thus they play an important role in controlling cell proliferation and cell differentiation phenotype. Cytokines play an important role in maintaining the immunosuppressive environment of the anterior chamber. Cytokines have been shown to induce ocular inflammation after intraocular administration and their role in the pathogenesis of intraocular inflammation was extensively investigated by analysing aqueous or vitreous samples taken from uveitis patients for diagnostic or therapeutic purposes (table 1).

Table 1: Cytokines

<table>
<thead>
<tr>
<th>Cytokines</th>
<th>Raised level in intraocular inflammation</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-1</td>
<td>Sarcoidosis, Intermediate uveitis.</td>
</tr>
<tr>
<td>IL-2</td>
<td>Behçet’s Disease, Fuchs Uveitis, Ankylosing Spondylitis, Intermediate Uveitis, Posterior Uveitis.</td>
</tr>
<tr>
<td>IL-6</td>
<td>Sarcoidosis, Vogt-Koyanagi-Harada disease, Behçet’s Disease.</td>
</tr>
<tr>
<td>IL-8</td>
<td>Inflammatory cystoid macular oedema.</td>
</tr>
<tr>
<td>IFN-γ</td>
<td>Behçet’s Disease, Fuchs Uveitis, Ankylosing Spondylitis, Vogt-Koyanagi-Harada disease.</td>
</tr>
<tr>
<td>IL-10</td>
<td>Fuchs’s Uveitis, Intermediate Uveitis.</td>
</tr>
</tbody>
</table>

IL=Interleukin, IFN=Interferon, TNF= Tumour Necrosis Factor

Biologicals:

Biologicals are a group of biologically active proteins and monoclonal antibodies, developed with the help of biological techniques rather than through chemistry. They include monoclonal antibodies, soluble receptors, cytokine themselves e.g. Interferons and natural cytokine antagonist like anakinra etc. Most of the biologicals are monoclonal antibodies directed against one specific cytokine, one specific type of inflammatory cell or one specific cell surface receptor. They also include recombinant cytokines like interferons too. These drugs exert selective inhibition of the specific part of the immune system and inflammatory pathways. They prevent inflammation induced structural and functional damage to eye without global suppression of the immune system. Biologicals are not recommended as first line therapy in control of intraocular inflammation. They are usually used in patients where standard immunosuppression has failed or has been poorly tolerated. Also they are often used in systemic condition with ocular involvements where control of concomitant inflammation might benefit. Examples include Behçet’s disease, severe rheumatoid arthritis, juvenile idiopathic arthritis etc. Most

Address for correspondence:
Dr Parthopratim Dutta Majumder, Department of Uveitis & Intraocular Inflammation, Sankara Nethralaya, Chennai.
e-mail: drparthopratim@gmail.com
Biologicals can be directed against one specific cytokine (B), one specific type of inflammatory cell (A) or one specific cell surface receptor (C). These drugs exert selective inhibition of the specific part of the immune system and inflammatory pathways.

Table 2: Biologicals

<table>
<thead>
<tr>
<th>Group</th>
<th>Name of Molecules</th>
<th>Acts Against</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNF – α Blocker</td>
<td>Etanercept</td>
<td>TNF – α</td>
</tr>
<tr>
<td></td>
<td>Infliximab</td>
<td>TNF – α</td>
</tr>
<tr>
<td></td>
<td>Adalimumab</td>
<td>TNF – α</td>
</tr>
<tr>
<td></td>
<td>Certolizumab</td>
<td>TNF – α</td>
</tr>
<tr>
<td></td>
<td>Golimumab</td>
<td>TNF – α</td>
</tr>
<tr>
<td>Anti-interleukin</td>
<td>Daclizumab</td>
<td>IL-2 receptor</td>
</tr>
<tr>
<td>therapies</td>
<td>Anakinra</td>
<td>IL-1 receptor</td>
</tr>
<tr>
<td></td>
<td>Gevokizumab</td>
<td>IL-1β</td>
</tr>
<tr>
<td></td>
<td>Tocilizumab</td>
<td>IL-6R</td>
</tr>
<tr>
<td></td>
<td>Rituximab</td>
<td>CD20</td>
</tr>
<tr>
<td>Interferons</td>
<td>IFN α</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recombinant IFN α-2a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recombinant IFN α-2b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pegylated interferons</td>
<td></td>
</tr>
<tr>
<td>Fusion protein</td>
<td>Abatacept</td>
<td></td>
</tr>
<tr>
<td>of cytotoxic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-lymphocyte-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>associated protein 4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monoclonal antibody:

Monoclonal antibodies can be regarded as the cornerstone of modern immunological advances in medicine. Monoclonal antibody (mAb) is an antibody produced by a single clone of cells or cell line and consisting of identical antibody molecules. Over the last decade these agents had developed as most promising tools for the treatment of variety of disorders. Till date more than 30 monoclonal antibodies have been approved as therapeutic drugs by the Food and Drug Administration (FDA) and it is estimated that more than 500 such agents are presently under development. For the benefit and better understanding, before going into the detailed discussion of biologicals, we need to discuss the following:

- Murine monoclonal antibodies: The term “murine” is generally used to relate animals belonging or pertaining to the Muridae, an Old World family of rodents, typically having
long hairless tails: includes rats and mice. Because of the dissimilarities between murine and human immune systems, murine antibodies have short half-lives, cause relatively reduced stimulation of cytotoxicity and can form complexes after repeated administration, leading to allergic reactions and sometimes anaphylactic shock. The suffix “–omab” is usually used to denote such antibodies.

- **Chimeric monoclonal antibodies:** A chimeric antibody is an antibody made by combining genetic material from a nonhuman source like mouse with genetic material from human beings. In chimeric antibodies, constant regions are typically derived from human IgG, and variable regions are derived from mouse IgG, leading to formation of antibodies that are approximately 65% human. This technique increases serum half-lives and increase their immunologic efficiency, compared to murine antibody. The suffix “–ximab” is used to denote the chimeric monoclonal antibodies.

- **Humanized monoclonal antibodies:** Humanized antibodies are made in a similar way like chimeric antibodies but contain 90–95% human genetic materials. Complementarity-determining regions (CDR) are immunoglobulin hypervariable domains that determine specific antibody binding. In humanized monoclonal antibodies, CDR regions are derived from the parental mouse IgG, but the remaining 90–95% of the antibody is composed of sequence derived from human IgG. That is why humanized monoclonal antibodies are also known as “CDR-grafted” antibodies. The suffix “–zumab” is used to denote the humanized monoclonal antibodies.

- **Human monoclonal antibodies:** Human monoclonal antibodies are produced by first transferring human immunoglobulin genes into the murine genome. The transgenic mouse is vaccinated against the desired antigen, leading to the production of monoclonal antibodies. This technique allows the transformation of murine antibodies in vitro into fully human antibodies. They are produced using transgenic mice or phage display techniques. The suffix “–umab” is usually used to denote human monoclonal antibodies.

The first human monoclonal antibody to be approved by the US Food and Drug Administration (FDA) was Adalimumab in 2002. Till date, seven human monoclonal antibodies have been approved for marketing in the United States.

**Fusion proteins:**
Fusion proteins can be defined as the proteins created by the joining of two or more genes that originally coded for separate proteins. Most of the therapeutic fusion proteins are Fc based fusion proteins, which are composed of an immunoglobulin Fc domain that is directly linked to another proteinaceous molecule of interest. These Fc based fused proteins have significant therapeutic potential, and they have spectrum of biological and pharmacological properties. The presence of the Fc domain also increases their plasma half-life and enables them to interact with Fc-receptors found on immune cells, a feature that is particularly important for their use in the management of intraocular inflammation. The suffix “–cept” is usually used to denote such fusion proteins. Examples include abatacept, etanercept etc.

Thus, biologicals can be considered as new frontiers in the armament of tackling uveitis, especially the cases that are refractory to more traditional immunosuppressive therapies. However risk of reactivation of granulomatous infections, prohibitive cost and limited long-term safety data must have to be taken into consideration.

**References:**
10. Ooi KG, Galatowicz G, Calder VL, Lightman SL.
E-consultation of Posterior Uveitis Cases-A Preliminary Study of Ten Cases

Jyotirmay Biswas1, Preeti Sharma1, Vatsal Parikh2, Sundaram Natarajan3, Aditya Kelkar4

Abstract: Electronic consultation (E-consultation) is the use of medical information exchanged from one site to another via electronic communications to improve the health status of a patient. It includes the various modes of consultation and videoconferencing. This paper presents an innovative E-consultation of uveitic cases by a single uveitis expert. Three primary ophthalmologists participated in this E-consultation. The average number of usual referrals per week was 3 per consultant. One uvea specialist who had 30 years of experience in this subject participated in the E-consultation. Ten cases were analysed and discussed over electronic media and treated accordingly. E-consultation is a promising tool. It improves the access to specialty care. It can overcome the scarcity of uvea specialists, particularly in India. This is also helpful for elderly, frail and extremely busy patients.

Key words: E-consultation, telemedicine, teleophthalmology.

Telemedicine as defined by American Telemedicine Association is the use of medical information exchanged from one site to another via electronic communications to improve the health status of a patient. It is a powerful tool for compensation of the lack of doctors in remote areas which are poor in resources1,2. Thus, application of telemedicine in the field of ophthalmology is termed as teleophthalmology. It includes the various modes of consultation such as use of mobile phones, e-mails, teleconferencing and videoconferencing.

Teleophthalmology has issues of requirement of simultaneous presence of the patient, the primary ophthalmologist or a physician and the specialist and also was complicated by the use of expensive specialized equipment, whereas consultation via E-mails is the most cost effective and allows for more direct communication and hence the kind of relationship building between the primary ophthalmologist and specialists.

Some of the ophthalmic conditions like ocular trauma, corneal ulcers, orbit cellulites, uveitis, retinal detachment, vascular occlusions, and acute glaucoma demand immediate care3,4. E-consultations can improve the efficiency of healthcare systems burdened with an increasing number of uveitic patients, and a limited number of uveitis specialists in India. This paper presents an innovative E-consultation of uveitic cases by a single uveitis expert which has not been reported before.

Table 1- Details of the cases referred for E-consultation

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Referred from</th>
<th>Probable diagnosis</th>
<th>Data sent</th>
<th>Final diagnosis</th>
<th>Treatment advised</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mumbai</td>
<td>Choroiditis</td>
<td>Fundus photo</td>
<td>Serpiginous Choroiditis</td>
<td>Systemic steroids</td>
</tr>
<tr>
<td>2</td>
<td>Mumbai</td>
<td>Choroiditis with optic neuritis</td>
<td>Fundus photo/FFA/OCT</td>
<td>Multifocal choroiditis with optic neuritis</td>
<td>Systemic steroids</td>
</tr>
</tbody>
</table>

We herein discuss two representative cases whose diagnosis were made with the help of E-consultation.

Case 1: A 40 year old patient with complaints of diminution of vision in both eyes since 15 days. On examination anterior segment of both the eyes was within normal limits. Fundus examination of both eyes showed hyperaemic disc and subretinal white lesions Fundus photographs(Figure 1A and 1B) and Fundus Fluorescein Angiography (Figure 1C and 1D) pictures were sent to the uvea

Address for correspondence:

Dr. Jyotirmoy Biswas, Medical Research Foundation, Sankara Nethralaya, No 41, College Road, Nungambakkam, Chennai, India Email: drjb@snmail.org

1 Medical Research Foundation, Sankara Nethralaya
2Drushti eye centre, Mumbai
3Aditya Jyot Eye Hospital, Mumbai
4National Institute of Ophthalmology, Pune
### Table 1

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Referred from</th>
<th>Probable diagnosis</th>
<th>Data sent</th>
<th>Final diagnosis</th>
<th>Treatment advised</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Mumbai</td>
<td>Healed tubercular choroiditis (OU)</td>
<td>Fundus photo</td>
<td>Active Tubercular choroiditis</td>
<td>AKT + Systemic steroids</td>
</tr>
<tr>
<td>4</td>
<td>Mumbai</td>
<td>Viral Retinitis</td>
<td>FFA, OCT</td>
<td>Bilateral VKH with subretinal fibrosis</td>
<td>Steroids</td>
</tr>
<tr>
<td>5</td>
<td>Mumbai</td>
<td>(CNVM ) post choroiditis</td>
<td>FFA/ICG/OCT</td>
<td>Steroid induced CSR</td>
<td>Avoid steroids or Anti VEGF</td>
</tr>
<tr>
<td>6</td>
<td>Mumbai</td>
<td>Choroiditis with CNVM</td>
<td>FFA/OCT</td>
<td>Reactivation of serpiginous choroiditis</td>
<td>Systemic steroids</td>
</tr>
<tr>
<td>7</td>
<td>Baku</td>
<td>Birdshot chorioretinopathy</td>
<td>Fundus photo</td>
<td>Syphilis</td>
<td>To investigate for same</td>
</tr>
<tr>
<td>8</td>
<td>Pune</td>
<td>APMPPE/ Serpiginous choroiditis</td>
<td>Fundus photo /FFA</td>
<td>APMPPE</td>
<td>Systemic steroids</td>
</tr>
<tr>
<td>9</td>
<td>Baku</td>
<td>VKH disease</td>
<td>FFA</td>
<td>VKH confirmed</td>
<td>IVMP</td>
</tr>
<tr>
<td>10</td>
<td>Mumbai</td>
<td>Choroiditis</td>
<td>FFA/OCT</td>
<td>ARMD related CNVM</td>
<td>Anti VEGF</td>
</tr>
</tbody>
</table>

FFA-Fundus fluorescein angiography; OCT-Optical Coherence Tomography; VKH-Vogt Koyanagi Harada disease; CNVM-Choroidal Neovascular Membrane; ICG-Indocyanine Green Angiography; APMPPE-Acute posterior multifocal placoid pigmented epitheliopathy; IVMP-Intravenous methylprednisolone; AKT-Anti Koch’s treatment

**Figure 1A and 1B:** Fundus photograph of right and left eye respectively showing multiple yellowish white discrete placoid lesions involving posterior pole respectively.

**Figure 1C:** Fundus Fluorescein Angiography pictures of left eye showing early blocked fluorescence corresponding to placoid lesions.

**Figure 1D** Fundus Fluorescein angiography pictures of right and left eye showing late hyperfluorescent spots corresponding to placoid lesions which showed blocked fluorescence in early phases.
specialist and diagnosis was made as acute posterior multifocal placoid pigmented epitheliopathy (APMPPE). Patient was started on systemic steroids at dose of 1mg/kg/body weight.

Case 2: A 28 year old male patient presented to primary ophthalmologist with complaints of sudden diminution of vision in both eyes since 15 days with best corrected visual acuity 3/60 and N18 in both eyes. On Slit Lamp examination anterior chamber was quiet in both the eyes. Fundus examination showed bilateral serous macular detachment. Vitritis was absent. Disc was normal. Fundus photographs (Figure 2A and 2B) and Fundus Fluorescein Angiography (Figure 2C and 2D) pictures were sent to the uvea specialist and diagnosis was made as Vogt Koyanagi Harada (VKH) disease. Patient was started on injection intravenous methylprednisolone followed by combination of systemic steroid at dose of 1 mg/kg/body weight and Azathioprine at dose of 50 mg 3 times daily for a month.

Discussion

E-consultation is new in diagnosis and management of posterior uveitis cases. The two cases described above i.e APMPPE and VKH disease were easily diagnosed with the help of good quality fundus photographs and fundus Fluorescein angiography pictures.

APMPPE clinically presents as multiple yellowish discrete placoid like lesions involving posterior pole which shows fundus Fluorescein angiography finding as early blockage with late phase staining. Similarly VKH disease classically presents as multiple pockets of subretinal fluid which initially shows
multiple pin point hyperfluorescence with leakage in late phases of Fundus Fluorescein angiogram. However other diseases like toxoplasmosis, tuberculous choroiditis, vasculitis which have typical clinical picture can easily be diagnosed by good quality clinical photographs.

In our present study the images were acquired with various available range of instruments which sometimes posed a challenge for us.

Electronic consultation (E-consultation) is a promising tool that help primary ophthalmologist to communicate with specialists about patients. It improves access to specialty care. Specialities like uvea for which images and investigations comprise a main diagnostic tool are more viable to use e-consultation because fundus pictures and angiography pictures can be easily attached to e-consultation requests.

The authors have also described the application of telecommunication in ophthalmic pathology.

Our study was limited by small number of cases. We will need a large case series to evaluate the efficacy and sensitivity of diagnosing cases through E-consultation.

E-consultation is definitely not going to replace face-to-face ophthalmic consultations. E consultation can be a powerful tool to overcome the scarcity of uvea specialists particularly in India. The availability of E-consultation has also been effective in reducing waiting times for specialist visits and avoiding unnecessary face to face visits. Patients who were not willing to travel to the specialist either because they were elderly and frail or unable to leave work were most likely to opt for the e-consultation option.

References

Salvaging DALK with Micro-bubble in Failed “Big Bubble” Cases

Sanjib Banerjee

**Purpose:** To report achievement of bare Descemet's membrane (DM) dissection with the help of micro-bubbles in eyes with failed big bubble formation. **Methods:** Retrospective review of 75 cases who underwent deep anterior lamellar keratoplasty (DALK). In 20 (26.7%) eyes big bubble failed. After manual layer dissection multiple tiny intrastromal micro-bubbles were noticed. Micro-bubble nearest to DM identified. After puncturing the bubble with tip of 26G needle, viscodissection helped to achieve successful separation of DM from the remaining stroma. **Results:** Microperforation occurred in 3 eyes. However, DALK was completed without any complications in 2 and conversion to PK in one eye. Micro-bubble guided visco-dissection helped in achieving 85% (17/20) success to expose bare Descemet in failed big-bubble cases of deep anterior lamellar keratoplasty (DALK). **Conclusion:** Micro-bubble guided DALK is effective in achieving bare DM in eyes with failed big bubble.

**Key words:** DALK, big bubble dissection, microbubble technique.

Lamellar keratoplasty has become an acceptable alternative to full thickness penetrating keratoplasty in the management of stromal dystrophies and keratoconus. Deep Anterior Lamellar Keratoplasty (DALK) involves the transplantation of the donor epithelium, Bowman's layer and stroma onto the recipient bed which contains only the bare Descemet's membrane (DM) with endothelium. The advantages of DALK are the absence of endothelial rejection and reduced incidence of steroid induced glaucoma and cataract. The big bubble technique is useful in separating the posterior stroma from the DM. However the success rate in achieving a big bubble varies from 50-90%. Failure to achieve a big bubble necessitates a conversion to Penetrating Keratoplasty (PK) or a trial of manual dissection which can lead to perforations and eventual conversion to PK. Here, we describe our experience of successful bare descemets DALK in 20 cases with failed big bubble by incising microbubble surgical technique.

**Patients and Methods**

Seventy five patients who underwent DALK for keratoconus, stromal dystrophies and corneal scar were selected based on a retrospective review. We also studied extensively in wet lab on failure of formation of big bubble. With the help of Anterior segment photography and AS-OCT we tried to analyse what change take place at the posterior surface of cornea. We also noticed the formation of multiple tiny bubbles (micro-bubble) of various size and at various depth.

**Figure 1a:** a) Failed Big bubble in Wet lab study, b) Posterior surface showing microbubbles, c) AS-OCT showing micro bubbles separated DM.

**Address for correspondence:**
Dr. Sanjib Banerjee, Disha Eye Hospitals, 88(63A) Ghosh Para Road, Barrackpore, Kolkata - 700120.
E-mail: dr.sanjiban@gmail.com

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Some are very close to and some have already separated the descemets. Puncturing this microbubble and injecting viscoelastic substance into it revealed easy separation of descemets from rest of the stroma in wet lab. Similar procedure applied in real situation when initial big bubble was failed.

**Surgical Technique**

**Big bubble DALK Surgery**

All DALK procedures were performed initially using Anwar’s big bubble (BB) technique. Handheld trephine was used for a circular partial thickness trephination of the host cornea. Partial thickness anterior stroma was dissected with crescent blade. A side port incision was made to drain some aqueous and some amount of air was introduced in AC. Needle was inserted bevel down at the peripheral trephination and advanced centripetally just above the DM. Air was slowly injected to create a cleavage plane between the posterior stroma and DM. In successful cases, the creation of a BB was indicated by the appearance of a white ring made of tiny bubbles surrounding an opaque circle. Thereafter, air was released by rapidly but carefully incising the remaining posterior stroma which was then divided into four quadrants and excised. Donor was trephined 0.25 mm larger than the recipient bed. A dry spear sponge was then used to remove the donor endothelium and the DM was stripped off with Macpherson’s forceps. This donor button now devoid of endothelium and DM was positioned onto the exposed DM of the recipient bed and sutured in place with 16 interrupted 10-0 nylon sutures with buried knots.

**Microbubble Technique**

There was failure of formation of big bubble in 20 cases. In these 20 cases, a BB was not achieved and instead numerous tiny bubbles of air rendered the stroma white in appearance.

In these cases of failed big bubble, manual layer by layer dissection and removal of the stroma was performed. After manual layer by layer dissection multiple tiny intrastromal micro-bubbles were noticed. Micro-bubble nearest to DM identified. After puncturing the bubble with tip of 26G needle, viscoelastic substance injected into it. Viscodissection helped to achieve successful separation of DM from the remaining stroma.

**Post Operative Care**

All patients were started on topical steroids, starting with Prednisolone Acetate eye drop in a tapering dose, antibiotics and artificial tears.

**Results**

Post-operative course was uneventful in all the cases. Using the microbubble incision technique, successful baring of the DM and subsequent DALK was achieved in 17 out of 20 failed

![Figure 2](image-url)
big bubble cases. Microperforation occurred in 3 cases out of which DALK was successfully completed in 2 cases and 1 was converted to PK. Micro-bubble guided visco-dissection helped in achieving 85% (17/20) success to expose bare Descemet in failed big-bubble cases of deep anterior lamellar keratoplasty (DALK).

Discussion

DALK is very challenging yet rewarding corneal surgery. DALK allows for grafting the donor’s anterior stroma including the epithelium, its basement membrane, and Bowman layer into the host bed, thus preserving the integrity of the healthy posterior tissue of the recipient cornea.

Anwar and Teichmann proposed the big-bubble technique, in which a successful big bubble formation allows one to expose bare Descemet membrane and creates a smooth surface to gain high optical quality because the level of visual acuity is related to the thickness of the residual recipient corneal stroma.

Here, we describe a salvaging technique for big bubble DALK when big bubble formation is not accomplished successfully initially. This novel technique described in this study seems to allow for an easier rescue and a safer way of preparation of bare DM in big-bubble DALK with failed big-bubble formation. This approach may even further increase the success rate of big bubble DALK, even in cases of failed big bubble formation.

Whether this surgical technique will indeed reduce the rate of conversion to PK will have to be analysed in a larger prospective study. Limitations of this case series are the limited number of patients and the short duration of follow-up. A larger prospective series will be necessary to validate these findings.

In addition, future studies will have to evaluate successful microbubble DALK using an intraoperative optical coherence tomography technique. Nonetheless, microbubble technique is a novel salvaging technique for baring DM in failed big bubble.17, 20

References

Corneal Endothelial Changes in Patients with Alcohol Dependence Syndrome

Alok Sati1, Mansa K V1, Rashmi Ranjan1, P S Moulick1, M A Khan1, Sandeep Gupta1, Sandeep Shankar2, Ashok Jha2, Deepak Kalra2

Abstract: Corneal oedema is known to occur following acute alcohol intake. Do corneal endothelial changes occur in alcohol dependence syndrome? Methods: Eighty two corneas, each of alcohol dependent syndrome (ADS) and control groups were examined by noncontact specular microscope. Influence of abstinence of alcohol, amount and years of drinking were evaluated. Results: Polymegathism is significantly more in ADS group than age matched control (p=0.03). Insignificant difference seen in cell density and pleomorphism. Conclusion: Polymegathism of corneal endothelium occurs in patients with alcohol dependence syndrome.

Keywords: Corneal oedema, Alcohol Dependence Syndrome, polymegatheism.

Bilateral corneal oedema is known to occur following acute intake of alcohol. The same has been reported by Shiono et al in 1987. They attributed this phenomenon to temporary endothelial dysfunction which was manifested by polymegathism and pleomorphism on specular microscopy. Of late, the similar phenomenon is seen in our clinical practice. If an acute alcohol intake leads to the endothelial insult, can the endothelial disturbance occur in patients who are dependent on alcohol? The current study is primarily aimed to evaluate the alterations of the corneal endothelium in patients with alcohol dependence syndrome.

Material and Methods

This study adheres strictly to the tenets of the Declaration of Helsinki, and a prior approval of the institutional ethical committee has been taken. It is a prospective, non interventional, nonrandomized, comparative study done at a tertiary care centre from August 2013 to August 2014. A total of 164 corneas have been evaluated. Out of 164 corneas, 82 corneas are of patients with ADS and the remaining act as control. We examined the corneal endothelium by noncontact specular microscopy in all patients. Patients with ADS and with diabetes mellitus, previous ocular surgery, and external ocular disease were excluded. Patients with a history of contact lens wear were also excluded. One cornea was randomly selected, and the central corneal endothelium was examined. Endothelial morphologic characteristics were quantified by measuring the cell density (cells/mm²), the coefficient of variation of cell size (a measure of polymegathism), and the percentage of hexagonal cells (an index of pleomorphism).

The endothelial count was performed with a noncontact specular microscope. The specular microscope was connected to a system that digitalised the images on finding them in camera-computer digital. These images were later visualized on the computer screen and the three best images per eye (i.e., six per patient) were selected and preserved.

In all cases, a complete ophthalmologic examination was performed at the initial contact and consisted of visual acuity, examination of the anterior segment, pachymetry, noncontact tonometry, examination of the posterior pole after dilatation, and specular microscopy of the endothelium. Following the initial examination and abstinence of alcohol for 1 month duration, re-evaluation was done with non contact specular microscopy and the same parameters were analysed once again. The factors influencing our study parameters (ECD, CV, % of hexagonality) i.e. life time alcohol consumption (0-100, 100-200, >200) and years of drinking (7-15 years & >15 years) were also evaluated.

Results

First we studied the homogeneity of the two groups (cases and control) in terms of age. Age is the variable that most affects the endothelium. Because of the importance of this parameter in this study, we made a special effort in the similarity of the groups in age parameter. Our groups showed no significant differences in age. Mean age in the patients with ADS was 36.63 years (35.03-38.23 with 95% CI) and 36.83 years (35.03 – 38.62 with 95% CI) in the control group. With the Student t test, we did not observe significant differences in these results (p = 0.20).

On admission, in the individuals with ADS, mean ECD was 2795.31+SD (2737.98-2852.64 with 95% CI) and individuals without ADS showed mean ECD of 2726.48 +SD (2721.94-2831.02 with 95% CI) with p=0.082. The cases showed mean CV of 38.88+SD (34.60-43.17 with 95% CI) as compared with controls who showed a mean CV of 34.28+SD(33.18-35.38 with 95% CI) with a significant as p=0.035. With ADS the mean % of hexagonality was 55.16+SD (55.16-55.16 with 95% CI) and without ADS the mean was 55.59+SD (53.82-57.35 with 95% CI) with p=0.45.

On comparing the endothelial parameters on day 1 and day 30 in individuals with ADS, no significant difference was seen as highlighted in table 1.

Address for correspondence:
Lt. Col Alok Sati, Dept of Ophthalmology, AFMC, Pune-40
E-mail : aloksati_123@rediffmail.com

1 Dept of Ophthalmology, AFMC Pune-40
2 Dept of Ophthalmology, Command Hospital (EC), Kolkata-27

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Among 31 individuals with a lifetime alcohol score of (0-100) showed higher means in ECD and CV with \( p = 0.219 \) and \( p = 0.525 \) and mean % hexagonality being more in score of (101-200) with \( p = 0.204 \). Years of drinking is grossly divided into 2 groups, consuming alcohol for 7-15yrs \( (n=64) \) and >15yrs \( (n=18) \). All the three parameters showed high means in 2nd group with ECD \( (p=0.336) \), CV \( (p=0.185) \), % hexagonality \( (p=0.608) \).

**Discussion:**

According to ICD -10 classification of mental and behavioral sciences, ADS is defined as presence of at least three of the following features for at least one year

- Tolerance : increasing amount and frequency
- Craving : strong desire
- Loss of control : over onset, termination and levels
- Harmful use : persisting use despite harm
- Salience : neglect of alternate pleasures
- Withdrawal

Though the literature is deprived of study of the similar nature, the current study clearly states endothelial alteration in form of coefficient of variation in patients with ADS.

Possible attributors for changes in endothelium are firstly due to the direct toxicity of ethanol which is secreted in aqueous and causing the cell damage and leading to endothelial alterations. Secondly, the prolonged hypoglycemia in ADS patients leads to lower levels of glucose in aqueous {normal glucose in aqueous is 60% of serum level} which leads to corneal oedema. The proposed mechanism being at a low glucose levels, the ATP which is not enough to maintain the Na-K ATPase pump. It is due to the shutdown of this pump, secondary changes are seen in the endothelium.

The strength of the current study is its uniqueness i.e. the first study of its kind. Moreover, it enables us to known that we have to be careful in dealing with the intraocular procedures in ADS patients.

Because this is the first study of this subject, further studies should be carried out to confirm or contest these results and to analyze the possible causes of these alterations in greater depth.

**References:**


### Table 1: Endothelial parameters

<table>
<thead>
<tr>
<th>Endothelial parameters</th>
<th>No of patients</th>
<th>Base line</th>
<th>Day 1</th>
<th>Follow up</th>
<th>Day 30</th>
<th>P value</th>
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<tr>
<td>ECD</td>
<td>82</td>
<td>2795.31</td>
<td>2812.96</td>
<td>0.626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV</td>
<td>82</td>
<td>38.88</td>
<td>34.82</td>
<td>0.072</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of hexagonality</td>
<td>82</td>
<td>57.16</td>
<td>56.78</td>
<td>0.363</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Glaucoma is an optic neuropathy characterized by progressive loss of retinal ganglion cells, which ultimately can lead to functional loss, visual disability, and blindness. Intraocular pressure (IOP) is a modifiable risk factor for glaucoma. IOP may be underestimated in eyes with thin corneas and overestimated in eyes with thick corneas.

A report of the landmark Ocular Hypertension Treatment Study (OHTS) showed that central corneal thickness (CCT) was found to be a powerful predictor of development of primary open-angle glaucoma among ocular hypertensive eyes. Eyes with CCT of 555 µm or less had a threefold greater risk of glaucoma developing than participants who had CCT of more than 588 µm.

Frequency doubling technology (FDT) perimetry has been proposed as a test for the early detection of glaucomatous functional damage. Testing involves presentation of frequency-doubling stimulus, and the contrast sensitivity of the stimulus is adjusted to determine the limit of detection. Several independent studies have shown that FDT has high sensitivity and specificity for discriminating glaucomatous and healthy subjects.

This present study aims to study the correlation between central corneal thickness (CCT) measured by ultrasound pachymetry and FDT in patients aged more than or equal to 40 years with high IOP and normal discs. This research work has two arms, the rural arm is an eye care centre in Hooghly District of West Bengal (Village: Kuliapara, P.O. Dhobapara, PS. Balagarh) and the urban arm is a tertiary eye hospital in Kolkata, West Bengal. People aged 40 years and above or those turning 40 in the calendar year with high IOP and normal discs and not on any topical or systemic medications underwent complete ophthalmological examination including CCT assessment by ultrasound pachymetry (Ocuscan RxP) and FDT (Humphrey, Carl Zeiss). Patients with history of intraocular surgery, ocular trauma, corneal opacities preventing accurate applanation tonometry and media haze dense enough to preclude adequate fundal view were not enumerated.

One hundred and eighty subjects fulfilled the laid down study inclusion criteria. Average CCT for the right eye (RE) is 530.74 µ and that for the left eye (LE) is 531.32µ (p=0.61, not statistically significant). IOP in the RE varied from 18 to 32 mm Hg with an average value of 23 mm Hg and that in the LE varied from 14 to 32 mm Hg with an average value of 22 mm Hg. Abnormal FDT in either eye was present in eighteen subjects of whom nine subjects had bilateral abnormal FDT and eight subjects had only RE affection and one subject had only LE affection.

Our study concludes that the included subjects with abnormal FDT had thinner CCTs as compared to those with a normal FDT. Extending this relation further, we conclude that among subjects with a higher IOP and normal discs or patients grouped as ocular hypertensives, thicker corneas lower the risk for development of early glaucomatous functional damage as picked up by FDT, as compared to patients with thinner corneas.

Key words: Frequency Doubling Perimetry, Central Corneal Thickness, Intraocular Pressure, Optic Disc.

Materials and Methods:
Institutional Ethics Committee clearance was obtained for conducting this population based cross sectional study. This research work has two arms, the rural arm is an eye care centre in Hooghly District of West Bengal (Village: Kuliapara, P.O. Dhobapara, PS. Balagarh) and the urban arm is a tertiary eye hospital in Kolkata, West Bengal.

People aged 40 years and above or those turning 40 in the calendar year and not on any topical or systemic medications were examined. Patients with history of intraocular surgery, ocular trauma, corneal opacities preventing accurate applanation tonometry and media haze dense enough to preclude adequate fundal view were not enumerated.

All patients were examined as follows:
(a) Ocular and medical history -- A detailed history pertaining to medical and ophthalmic problems was elicited. Data collected includes use of glasses and its duration, history of previous trauma or surgery or laser in the eyes, history of ocular and oral medication, significant systemic illness with special reference to diabetes or hypertension, significant family history and addiction history.
(b) Refraction and recording of uncorrected and best-corrected visual acuity.
(c) Torch light external ocular examination including ocular movements and any other obvious strabismus / eyelid pathology.

Address for correspondence:
Dr Subhrangshu Sengupta, B.B. Eye foundation, Sukhsagar; 2/5 Sarat Bose Road, Kolkata-700020.
Email: drssengupta@gmail.com

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(d) Pupillary evaluation – Carried out in dim light conditions. The patient is asked to focus on a distant object and the strength and the direct and indirect reaction of each pupil noted. The presence or absence of an afferent pupillary defect is also checked for.

(e) Slit lamp biomicroscopy, including Van Herrick grading of the angle of the anterior chamber angle.

(f) Applanation tonometry using the Goldmann Applanation Tonometer.

(g) Corneal pachometry – Central corneal thickness using ultrasound pachometry (Ocuscan RxP, Alcon labs, USA). Average of three readings, rounded off to the nearest whole number, was taken.

(h) Gonioscopy – Done in dim illumination using a narrow slit beam not extending onto the pupillary area. Goldmann single mirror lens is used for the purpose. The angle is graded using Shaffer’s grading system.

(i) Grading of lens opacities – using the LOCS II Classification after pupillary dilatation.

(j) Evaluation of optic disc using +78D lens. The vertical cup-disc ratio (VCDR) was recorded and any other significant findings like presence of peri papillary atrophy, optic disc/ peripapillary haemorrhage, bayonetting sign, baring of circumlinear vessels, laminar dot sign, etc were recorded.

(k) Frequency Doubling Perimetry (Humphrey FDT, Carl Zeiss, Dublin, USA) was performed in all patients. FDT perimetry was performed using a modified binary search staircase threshold procedure with stimuli presented for a maximum of 10° square, 0.25 cyc/° sinusoidal gratings, counterphasing at 25 Hz. Targets are presented in 1 of 19 test areas located within the central 30° of the visual field. The test uses a modified binary search staircase threshold procedure with stimuli presented for a maximum of 720 msec and measures the contrast needed for detection of the stimulus. During the first 160 msec, stimulus contrast is increased gradually from zero to the contrast selected for that presentation. If the stimulus is not seen, it remains at this contrast for up to 400 msec and then is gradually decreased to zero during the final 160 msec. The interstimulus interval varies randomly up to 500 msec. Abnormality for an FDT examination was determined by comparison with the manufacturer’s internal normative database. An abnormal examination was defined for this study by the presence of at least two test areas (points) with P<0.05 or worse on the pattern deviation plot or by the presence of a PSD with P<0.05 or worse. To be included, all subjects had to have reliable visual field results. This was defined as 25% or fewer false-positive results, false-negative results, and fixation losses.

All subjects over 40 years or turning 40 in the calendar year and gonioscopy revealing Shaffer’s Grading 3 or more in more than 180 degrees in both eyes were included for enumeration and analysis. More than two thousand people were thus enumerated.

All of the enumerated patients with IOP more than or equal to 21 mm Hg in either eye and VCDR of less than or equal to 0.5 in both the eyes were included for this current study.

Results:

One hundred and eighty subjects fulfilled the laid down study inclusion criteria. Average age of the subjects was 55 years and male: female ratio was 85:95. Average CCT for the right eye (RE) was 530.74 µ and that for the left eye (LE) was 531.32µ (p=0.61, not statistically significant). IOP in the RE varied from 18 to 32 mm Hg with an average value of 23 mm Hg and that in the LE varied from 14 to 32 mm Hg with an average value of 22 mm Hg. However, interestingly there was a statistically significant difference in the average IOP values of the two eyes (p<0.001). Abnormal FDT in either eye (defined by the presence of at least two test areas (points) with p<0.05 or worse on the pattern deviation plot or by the presence of a PSD with p<0.05 or worse) was present in eighteen subjects as compared to males is similar to various other similar studies.

With high sensitivity and specificity for glaucoma diagnosis, FDT perimetry is increasingly used as a diagnostic tool for glaucoma.\textsuperscript{9-11} FDT perimetry also offers the potential advantage of reduced testing time and less variability compared with SAP.\textsuperscript{12} Overall 10%(18/180) of the subjects had abnormal FDT in either or both eyes. This is in accordance with previous studies in which the prevalence of FDT abnormalities in eyes with OHT has been reported to be between 11% and 46%, depending on the

| Table1: CCT in various groups |

<table>
<thead>
<tr>
<th>Groups</th>
<th>Number of subjects</th>
<th>CCT in Right Eye(µ)</th>
<th>CCT in Left Eye(µ)</th>
<th>Average CCT (µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilateral abnormal FDT</td>
<td>9</td>
<td>516µ</td>
<td>518µ</td>
<td>517µ</td>
</tr>
<tr>
<td>Only Right Eye Abnormal FDT</td>
<td>8</td>
<td>521µ</td>
<td>531µ</td>
<td>526µ</td>
</tr>
<tr>
<td>Only Left Eye Abnormal FDT</td>
<td>1</td>
<td>477µ</td>
<td>472µ</td>
<td>475µ</td>
</tr>
<tr>
<td>Abnormal FDT in one or both</td>
<td>18</td>
<td>516µ</td>
<td>521µ</td>
<td>519µ</td>
</tr>
<tr>
<td>Normal FDT in both eyes</td>
<td>162</td>
<td>532µ</td>
<td>533µ</td>
<td>532µ</td>
</tr>
</tbody>
</table>
criteria used and the specific risk characteristics of the population evaluated.\textsuperscript{2,13}

With the screening protocol of FDT, Quigley\textsuperscript{14} found that the criterion with best performance to discriminate between glaucoma and normal eyes was the presence of two or more abnormal locations, regardless of the severity of the defect. This criterion resulted in a sensitivity of 91\% with specificity of 94\%. In his study, Quigley also found that the severity of abnormal points with FDT was not as well correlated with glaucoma damage as the total number of abnormal points.

Among the eyes included in our study, average CCT of both the eyes as well as individual eyes was lower in the abnormal FDT group as compared to the subjects with normal FDT in both eyes. This difference was not statistically significant when the individual eyes are compared in the two groups (for RE p=0.055 and for LE p=0.13). However when the average CCT for both eyes was compared between the two groups of with normal and abnormal FDT, a statistically significant difference was obtained (p=0.013, ie p <0.05). This result is similar to that obtained by Medeiros et al\textsuperscript{9} who studied 65 eyes with OHT and normal optic discs. They found that patients currently diagnosed with OHT, but with visual field loss detected by FDT perimetry, had significantly lower CCT measurements than patients with OHT with normal FDT results.

FDT is widely accepted as a test for early detection of functional glaucomatous damage. Our study concludes that the included subjects with abnormal FDT had thinner CCTs as compared to those with a normal FDT. Extending this relation further, we conclude that among subjects with a higher IOP and normal discs or patients grouped as ocular hypertensives, thicker corneas lower the risk for development of early glaucomatous functional damage as picked up by FDT, as compared with patients with thinner corneas.

This study focuses on the subgroup of patients with normal discs and high IOP. Generally a normal SAP for this group classifies them as ocular hypertensives and they are mainly followed up without initiation of anti glaucoma drugs. However, if these patients are not adequately motivated and explained regarding their ocular condition with special emphasis on the need for follow up at regular intervals, there is a very high chance of them being lost to follow up. The findings of our study further substantiates the need for very close follow up in those who have a thinner CCT, by showing the appearance of functional glaucomatous damage in this group through FDT. Further this study also assumes significance in the setting of rural India where a Humphrey Standard Automated Perimeter may not be easily accessible. FDT being a portable instrument, our study shows that this instrument can be used effectively to stratify the sub group of OHTs with lower CCT into a very important target group for regular follow up. This can further help in the better resource and manpower utilization. Therefore this study establishes that CCT should be taken into account when assessing the risk of patients with OHT to develop glaucoma.

References :


Retinal Detachment in Morning Glory Syndrome: Providing Proof of Concept

Preeti Sharma1, Rupak Roy1, Kumar Saurabh1, Debmalya Das2, Avirupa Ghose2, Dhileesh P. Chandrasekharan2

Abstract: To report a case of retinal detachment with MGS and explore the causative factors using SD-OCT. METHODOLOGY: Sixteen year old male presented with left eye Morning Glory disc and total retinal detachment. SD-OCT line scan passing through the disc showed a communication between subretinal space and optic nerve suggestive of a break and a hyper-reflective echo at the level of vitreous suggestive of fibroglial tissue. Patient underwent 23 G pars plana vitrectomy with endodrainage via disc break, red diode laser around disc and silicone oil tamponade. Results: At final follow up, left eye showed attached retina with BCVA improving to 6/60 and successful closure of the communication on SD-OCT. Conclusion: MGS is a part of a spectrum of optic disc cavitory anomalies. The cause of retinal detachment in MGS is still unclear. Formation of break in anomalous peripapillary tissues and traction are considered contributory. SD-OCT is a valuable tool in detection of breaks in MGS and help in accurate pre-operative planning.

Key words: SD OCT, Morning glory syndrome, retinal detachment.

Morning Glory Syndrome (MGS) is a congenital anomaly of optic nerve head characterized by excavated nerve-head defect with a central tuft of white fibroglial tissue. Retinal detachment (RD) has been reported in 26-38% of patients with MGS and is considered as the most common ocular complication associated with MGS.1 Due to anomalous development, the peripapillary area is prone to retinal breaks. Identification of retinal breaks is difficult due to the lack of contrast between the white scleral background and the anomalous disc.2 Cennamo et al3 has described the SD OCT features of MGS. The current report highlights the role of Spectral Domain Optical Coherence Tomography (SD-OCT) in imaging peripapillary breaks and in managing RD associated with MGS.

Case Report

A 16 year old male presented with complaints of diminution of vision in left eye since 1 week. His best corrected visual acuity (BCVA) in right eye was 20/20 and counting finger 1 meter. Right eye fundus showed normal disc and attached retina. Left eye fundus examination showed Morning Glory disc associated with total retinal detachment. (Figure 1A). SD-OCT line scan passing through the disc of left eye showed a communication between subretinal space and optic nerve suggestive of a break in that area (Figure 1B) A hyper reflective echo at the level of vitreous with attachment to the same area was noted suggestive of fibroglial tissue over optic nerve. (Fig 1B) Subsequently patient underwent three port 23 G pars plana vitrectomy with endodrainage via disc break with fluid air exchange, endolaser around the disc with red diode laser and silicone oil tamponade. At final follow up 8 weeks later, left eye examination showed attached retina with silicone oil in situ. (Fig 2A) His BCVA improved to 6/60. SD-OCT documented successful closure of the communication. (Fig 2C).

Address for correspondence:
Dr. Rupak Roy, Aditya Birla Sankara Nethralaya, 147, Mukundapur, E.M.Bypass, Kolkata-700 099, West Bengal, India.
1Aditya Birla Sankara Nethralaya, Kolkata.
2Shri Bhagwan Mahavir Vitreoretinal Service Sankara Nethralaya, Chennai-600 006, Tamil Nadu, India
email: rayrupak@gmail.com

Figure 1A: Colour fundus montage photograph of left eye showing morning glory disc with associated retinal detachment.

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**Figure 1B:** Spectral Domain optical coherence tomography of left eye preoperatively showing abnormal communication between subretinal space and optic nerve (arrow) and vitreous tractional bands (arrowhead).

**Figure 1C:** Colour fundus photograph of left eye showing the area through which the line scan passes.

**Figure 2A:** Colour fundus montage photograph of the left eye showing attached retina with laser marks post-operatively.

**Figure 2B:** Fundus photograph of left eye showing the area through which the line scan passes.

**Figure 2C:** Spectral Domain optical coherence tomography of left eye shows closure of the communication postoperatively (black arrow).


Discussion

Morning Glory syndrome is a part of a spectrum of optic disc cavitary anomalies which include optic disc pit and optic disc coloboma. Optic disc colobomas and the morning glory syndrome are uncommon. Retinal detachment may develop in up to one-third of patients with morning glory syndrome and spontaneous resolution has also been observed.

Various theories have been advanced regarding the origin of the subretinal fluid seen in these eyes, whether this is cerebrospinal fluid or fluid from the vitreous space. This issue remains a subject of controversy. In both optic disc colobomas and morning glory syndrome, the peripapillary retina extends into the anomalous peripapillary scleral defect. The retinal tissue within the defect has been observed to be thinner, incompletely developed, and atrophic. Sometimes the retina is detached in this area. Retinal breaks have been observed in the peripapillary retina but because the breaks were observed in some eyes undergoing reoperation for retinal detachment, the exact origin remains uncertain.

The vitreous in young eyes, such as these, is usually transparent and clear, and thus is also difficult, if not impossible, to appreciate on clinical examination. Specifically, the 3D image allowed a qualitative assessment of the degree of vitreous condensation and adhesion in the area of the optic disc. Although still not possible to determine the degree of traction, the density of the vitreous strands could be better visualized on 3D scans compared with two-dimensional scans. 3D reconstruction allows rotation of the viewing perspective, improving the ability to identify retinal breaks within the coloboma.

The risk of causing a retinal break within the optic nerve defect in the thin retina overlying the coloboma is high, and care was taken not to pull too firmly and cause any new retinal breaks centrally. The use of laser endophotocoagulation at the retinal margin of the colobomatous defect seems to provide an effective barrier to the passage of fluid into the subretinal space. It is suggested that the long wavelength of the diode laser (840 nm) may be safer by reducing the damage to the inner retina caused by photocoagulation. In these eyes, the resolution of the subretinal fluid and retinoschisis often took up to 12 months postoperatively.

Formation of break in anomalous peripapillary tissues and traction forces are postulated to be contributory. Surgical success of the retinal reattachment procedure depends vastly on accurate preoperative localisation of breaks. In the present case we were able to document both the break and the overlying tractional elements accurately with SD OCT, in the preoperative period and document successful closure of the break and elimination of tractional forces by SD OCT in the postoperative period. Hence this report gives credence to hypothesis of the role of both the breaks and tractional forces in MGS related RD. SD OCT is an extremely valuable tool in detection of breaks in optic disc cavitary anomalies including MGS and help in accurate preoperative planning.

References:

Cataract Surgery in Infant Following Iatrogenic Posterior Capsular Rupture During Intravitreal Injection Bevacizumab for Retinopathy of Prematurity - A Case Report

Lav Kochgaway, Partha Biswas, Ajoy Paul, Sagar Bhargava, Maneesh Singh

Abstract: Bevacizumab seems to have a promising future for the treatment of ROP; however, there is still a lot of uncertainty that surrounds its use. The potential for development of vascularized peripheral retina makes injection of VEGF inhibitors an exciting option. Bevacizumab injection for ROP also has potential for use in the Third World, where babies are screened through telemedicine and ophthalmologists are not locally available for laser treatment. ROP is likely to become more of a problem in developing countries as neonatal care improves. The unpredictable post-injection course and the unknown systemic side effect profile in premature infants have created significant controversy and limited its widespread acceptance. One of the complications of intravitreal Bevacizumab in premature infants with crowded anatomical landmarks is lens touch with the needle. In this article we present a case of iatrogenic cataract in an infant following posterior capsular rupture with needle of intravitreal Bevacizumab injection.

Key words: Paedatric cataract, Bevacizumab, Retinopathy of Prematurity.

The aim of this article is to discuss the management of iatrogenic cataract (Figure 1) following posterior capsular rupture from needle of intravitreal Bevacizumab injection in a three month old infant.

Figure 1: Iatrogenic Cataract in Infant.

The child presented to us at around three months of age with cataract in one eye. The referring doctor had diagnosed retinopathy of prematurity in the child and treated with intravitreal Bevacizumab injection for the same. Unfortunately in premature children where anatomical landmarks are not the same as adults, there was lens touch with the needle and the child developed cataract which was visible to parents few weeks later as white pupillary reflex.

Initial clinical examination and B scan ultrasound evaluation of posterior segment was done before taking up the child for surgery. The surgical procedure was explained to the patient's parents. After discussion with them it was decided to implant an intraocular lens in the child due to the following factors - educational level and awareness in parents was lacking - so compliance with contact lens would not be good. Implanting an intraocular lens targeting a refraction of moderate hyperopia would at least not induce amblyopia due to non compliance.

Methods

The child was posted for surgery under GA following preoperative evaluation and clearance from the paediatrician. Preoperatively we were aware that it would be more challenging than a regular paediatric cataract surgery, due to the crowded anterior chamber and low scleral rigidity. The initial capsulorrhexis was smooth, for which a micro rhexis forceps was used (Figure 2). A larger rhexis was aimed as capsulorrhexis would contract fast at such young age and may lead to visual axis opacification. Towards the final stages of capsulorrhexis - iris started protruding out of the main port (Figure 3). Aiming for less instrumentation and also anticipating pre-existing posterior capsular defect, the 23 gauge cutter itself was used to aspirate the cortical matter (Figure 4). Slow aspiration of the cortex laid bare the pre existing defect in the posterior capsule (Figure 5). After the defect was recognized - combination of aspiration cut and only aspiration settings were used to remove the remaining cortex without causing vitreous traction. Meanwhile the pupil was getting smaller due to the iris prolapse and unstable anterior chamber. Luckily there was no vitreous prolapse in the bag or anterior chamber, as vitreous gel is quite well formed at this age.
Figure 2: Capsulorhexis.

Figure 3: Iris Prolapse During Capsulorhexis.

Figure 4: Cortical Aspiration Using Cutter.

Figure 5: Pre-existing Posterior Capsule Defect Exposed.

Figure 6: Iris Hooks for Better Visualization.

Figure 7: Intraocular Lens Being Dialled in Capsular Bag.
Discussion

Bevacizumab (Avastin; Genentech Inc., San Francisco, California, USA) is a full anti-VEGF human monoclonal antibody approved in 2004 by the FDA for the treatment of metastatic colon cancer and used off-label in the treatment of neovascular retinal diseases, such as retinopathy of prematurity (ROP)\(^1\)\(^\text{-}\)\(^2\). The first reports on the use of bevacizumab for ROP were published in 2007 and they presented the experience in aggressive posterior ROP (AP-ROP)\(^3\)\(^\text{-}\)\(^\text{5}\). This severe form of ROP progresses rapidly to retinal detachment and often has an unfavorable outcome with standard laser treatment\(^6\)\(^\text{-}\)\(^\text{10}\). The reports on bevacizumab in AP-ROP included a small number of infants, but the finding that the outcomes were better in comparison with the ones of laser brought them into the spotlight.

Nicoara et al reported no intraocular side effects in their series of 74 eyes in which intravitreal Bevacizumab was injected for ROP. Saeed et al described cataract surgery technique in patients with iatrogenic posterior capsule rupture following intravitreal bevacizumab injection. Careful preoperative planning and attention to fluidics, low bottle height, appropriate incisions, careful hydrodelineation without hydrodissection, avoidance of nuclear rotation, and use of a dispersive ophthalmic viscosurgical device to tamponade vitreous allows safe phacoemulsification with secure posterior chamber intraocular lens implantation. Biaxial microincision cataract surgery can achieve efficient removal of the lens matter without rotating the nucleus, reducing the chance of capsule tear extension and loss of nuclear fragments into the posterior pole.

Conclusion

Iatrogenic posterior capsular rupture is a known complication of intravitreal injection Bevacizumab in premature infants with retinopathy of prematurity. Cataract surgery in these infants is a challenging situation.

References


An Effective Model for Counselling in Diabetic Patients

Meena Chakrabarti, Preethi Benjamin, Arup Chakrabarti

Aim: There is mainly a lacunae in the awareness of the available treatment modalities for diabetic retinopathy. In addition there is no proven service delivery model for diabetic retinopathy. With the overall aim of controlling diabetes and creating an awareness of its complications we developed a comprehensive model to screen for diabetic retinopathy.

Materials and Methods: The Main Objectives of this Model were 1. Eye Health Promotion by creating awareness in the community, among Ophthalmologists and in all diabetic patients visiting our tertiary eye care centre 2. Prevention by developing screening model for diabetic retinopathy patients for the general population and by screening High risk diabetic cases for diabetic retinopathy 3. Treatment by providing tertiary care in the form of appropriate treatment for diabetic retinopathy patients.(FFA and Laser Photocoagulation, Vitrectomy, Pharmacological therapies) and 4. Rehabilitation by providing low vision care using low vision aids for burnt out diabetic retinopathy with sub normal vision. Results: Analysis of our database showed the effect of the awareness programme 1. Improvement in diabetic control 78%, Compliance to follow up: in 78%, Rate of early detection of diabetic retinopathy: in 10%, Progression of existing retinopathy (worsening of the retinopathy status) occurred in 20%. 86 patients with progression of retinopathy underwent vitrectomy. Conclusion: Controlling diabetes and creating an awareness of its complications was possible in this comprehensive model to screen for diabetic retinopathy.

Key words: Diabetic retinopathy awareness, Diabetic retinopathy screening, Diabetic retinopathy prevention.

There are approximately 93 million people with diabetic retinopathy globally, 17 million with proliferative diabetic retinopathy, 21 million with diabetic macular edema and 28 million with vision-threatening diabetic retinopathy worldwide. The prevalence of diabetic retinopathy is 18% in an urban population with Diabetic Mellitus in India. According to WHO, India will become one of the major hubs of diabetic population; the number of cases of adult onset diabetes mellitus will grow to nearly 80 million in 2030. This epidemic increase in prevalence of diabetes is compounded by the fact that this disease can only be controlled and never cured in the life time of the patient. In addition to being a major cause of morbidity from multisystem complications, diabetes is the leading cause of blindness from diabetic retinopathy in the “working age” population.

The real problem lies in the fact that diabetic patients are not aware that diabetes affects the eyes. Physicians and general medical practitioners do not give much importance to this aspect of the disease. Many ophthalmologists refer cases at a very advanced stage to tertiary centers when nothing can be done. This is mainly due to the lacunae in the awareness of the available treatment modalities. In addition there is no proven service delivery model for diabetic retinopathy. With the overall aim of controlling diabetes and creating an awareness of its complications we have developed a comprehensive model to screen for diabetic retinopathy.

Materials and Methods:
The Main Objectives of this Model are

1. Eye Health Promotion
   - To create awareness in the community.
   - To create awareness among ophthalmologists.
   - Awareness in all diabetic patients visiting our tertiary eye care centre.

2. Prevention
   - Develop “screening model for diabetic retinopathy patients” for the general population.
   - Screen “High risk” diabetic cases for diabetic retinopathy.

3. Treatment
   To provide tertiary care in the form of appropriate treatment for diabetic retinopathy patients:
   - FFA and Laser Photocoagulation.
   - Vitrectomy.
   - Pharmacological therapies.

Rehabilitation:
To provide low vision care using low vision aids for burnt out diabetic retinopathy with sub normal vision.

Stage I of Model
Primary Physicians Awareness Program
The following were the guidelines given to primary care physicians. They were advised to interact with their diabetic patients and

1. Inform patient about sight threatening complications of diabetes.
2. Educate patients on Ophthalmic Examination schedule in various type of diabetes.
   - Type I Insulin dependent DM: At least one dilated ophthalmic evaluation (including dilated fundus evaluation) within 5 yrs of diagnosis.
   - Type II Maturity Onset DM: At time of diagnosis of DM.
   - Pregnant Diabetic: Once in every Trimester.
3. Create awareness of results of Major multicentre trials on diabetes in their diabetic patients.
   - Glycaemic control and progression: Good and constant glycaemic control can prevent progression of diabetic retinopathy.
   - PDR is an important risk factor for development of myocardial infarction, stroke and amputation.
   - Patients with PDR are at higher risk of developing diabetic nephropathy.
   - Increased blood Pressure, anemia (Hb<12g %), elevated lipid and gross proteinuria can accelerate the course of diabetic retinopathy.
   - There is no ocular contraindication to Aspirin therapy when required for cardiovascular diseases.

**Primary Physician Awareness was achieved through**
- Seminars and Workshops for Medical Practitioners: 2 per month
- Guest Lectures in clubs and organizations: 1 per month
- Regular Press Meetings: 1 every third month

Brochures depicting stages of Diabetic Retinopathy and Treatment modalities were distributed at these meetings after diabetic lectures on screening, prevention and management of diabetic retinopathy.

**Stage II of Model:**

**Awareness Program in Diabetic Patients**
- Conducting Diabetes Screening Camps in association with Diabetologists, Indian Diabetic Education Association, labs, drug companies and residents association clubs: 2 per month for the past 3 years (2012 – 2015) = 60 camps conducted over the past 3 years.
- Diabetic Retinopathy Screening Camps: 60 camps conducted from 2012 – 2015. (Fig. 1)
- Education of diabetic patients attending our centre (5600 patients in 3yrs). Using Flip Charts, educational CD’s and giving educational literature.

**Stage III of Model:**

Training of Paramedical Staff to support counselling. The paramedical staff were made to follow a structured 30 days programme where they were taught all the main points to be emphasized on during counseling. They attended angiography, laser and had postings in the OT during diabetic vitrectomies to enhance their ability to counsel.

To assess the efficacy of this model programme we tried to analyze

1. The rate of reference of diabetic retinopathy to our tertiary care centre (Table 1).

The number of references to our centre has shown a progressively increasing trend. Analysis of our database showed the effect of the awareness programme.
2. Improvement in diabetic control by comparing HbA1C done every 3rd month in patients who could afford this test showed that stable diabetic control could be achieved in 78%.

3. Compliance to follow up: The scheduled follow up strategy was discussed with the patients. Analysis of our data on 5600 patients followed up for 3 yrs revealed that we were able to get compliance in 78% of patients who reported regularly at least once in 6 months.

4. Rate of early detection of diabetic retinopathy: We were able to detect early retinopathy in the form of microaneurysms and dot and blot hemorrhages in 10% of the patients who were followed up at our centre. They were again educated on the necessity for strict diabetic control and advised 4 monthly follow up.

5. Progression of existing retinopathy (worsening of the retinopathy status) occurred in 20% of our subjects. These were all patients with preproliferative and proliferative stages of retinopathy at baseline. Depending on the condition they were subjected to either fill in PRP or vitrectomy if there was non resolving hemorrhage. Eighty six patients with progression of retinopathy underwent vitrectomy.

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### TABLE 1: Rate of References

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of References</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2009-2010</td>
<td>198</td>
</tr>
<tr>
<td>2010-2011</td>
<td>250</td>
</tr>
<tr>
<td>2011-2012</td>
<td>325</td>
</tr>
<tr>
<td>2012-2013</td>
<td>460</td>
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<tr>
<td>2013-2014</td>
<td>600</td>
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<tr>
<td>2014-2015</td>
<td>1200</td>
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</table>

### TABLE 2: Treatment Protocol

<table>
<thead>
<tr>
<th>STAGE OF RETINOPATHY</th>
<th>TREATMENT</th>
<th>% OF PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDR/No Maculopathy</td>
<td>Observation</td>
<td>42%</td>
</tr>
<tr>
<td>BDR/Maculopathy CSME</td>
<td>FFA; Focal Laser / Intravitreal Pharmacotherapy (Avastin / Bevacizumab)</td>
<td>12%</td>
</tr>
<tr>
<td>BDR/ Maculopathy/ Gross CSME</td>
<td>FFA; Grid Laser, Intravitreal Pharmacotherapy (Avastin / Bevacizumab)</td>
<td>8%</td>
</tr>
<tr>
<td>PPDR</td>
<td>Observation of compliance to F/U</td>
<td>10%</td>
</tr>
<tr>
<td>PPDR</td>
<td>PRP I</td>
<td>6%</td>
</tr>
<tr>
<td>PDR</td>
<td>PRP II</td>
<td>10%</td>
</tr>
<tr>
<td>PDR VH/TRD</td>
<td>PPV</td>
<td>3%</td>
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<tr>
<td>IVA</td>
<td></td>
<td>1%</td>
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</table>

### TABLE 3: Prevalence of Diabetic Retinopathy

<table>
<thead>
<tr>
<th>SL. NO</th>
<th>STUDY</th>
<th>YEAR</th>
<th>PREVALENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WESDER (Wisconsin Epidemiological study of Diabetic Retinopathy)</td>
<td>1980-1982</td>
<td>50.3%</td>
</tr>
<tr>
<td>2</td>
<td>SLVDS (Scan Louis Valley Diabetic Study)</td>
<td>1984-1988</td>
<td>35.3%</td>
</tr>
<tr>
<td>3</td>
<td>SAHS (San Antonio Health Survey)</td>
<td>1985-1987</td>
<td>36.2%</td>
</tr>
<tr>
<td>4</td>
<td>BDES (Beaver Dam Eye Study)</td>
<td>1988-1990</td>
<td>35.1%</td>
</tr>
<tr>
<td>5</td>
<td>Barbados Eye Study</td>
<td>1988-1992</td>
<td>28.8%</td>
</tr>
<tr>
<td>6</td>
<td>Melbourne VIP, Melbourne</td>
<td>1991-1998</td>
<td>27.5%</td>
</tr>
<tr>
<td>7</td>
<td>Blue Mountain Eye Study</td>
<td>1992-1994</td>
<td>29.0%</td>
</tr>
</tbody>
</table>

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### Analyzing the Treatment Protocol Adopted

Sequential scheduled follow up helped in early detection and early initiation of treatment and early stabilization of retinopathy.

This model for counseling diabetic patients can be carried out at all levels of eye care. Efficient and trained paramedicals can act as excellent counselors to the patients.

The results of our study show that this is an excellent model to emulate at other eye care centers. Creating public awareness, screening for early detection; initiation of treatment at the earliest will go a long way in controlling an epidemic of diabetic retinopathy.

### Discussion:

The WHO has estimated the diabetic population in the world to be about 150 million – 170 million. This population is expected to grow to more than 370 million by the year 2030. While diabetes will continue as a major health problem in the developed world it is estimated that approximately 70% of all new cases will appear in the developing countries.

There is a rising prevalence of diabetes in urban India. Between 1989 and 2004, the prevalence of diabetes increased by 72.3%. The prevalence rate-age standardized for the Chennai census 1991 according to the Cures Study was 14.3%. The diabetic population in India will increase from 19 million in 1995 to 57 million in 2025. The diabetes Care Asia study, a multi country, multi centre study conducted in 230 centres in 12 South East Asian countries and enrolling 22,000 patients was undertaken to study and compare the diabetes profile and quality of care. It is also note worthy that patients from India have the lowest mean age of onset of 43.6 years in comparison to other South East Asian countries where the mean age of onset is higher and ranges from 49.6 (Thailand) to 51.5 (Taiwan) in this study.

The reported prevalence of diabetic retinopathy varies in different studies as very few population-based studies had standardized grading and documentation systems. The Table 3 given below summarizes the prevalence of diabetic retinopathy reported in various studies.
IN the Indian Scenario, JS Jain et al screened a diabetic population attending the diabetic clinic and eye outpatient service of PGI, Chandigarh and reported a prevalence rate of 42.9%. Two large clinic based Indian studies have shown prevalence rate of diabetic retinopathy in Type 2 diabetic patients in South India as 34.1% and 37% respectively. These studies are biased by the referral of more severe cases to tertiary care centre.

The Andhra Pradesh Eye Disease Study (APEDS) analyzed the prevalence of diabetic retinopathy in a population of self reported diabetics and reported a prevalence ratio of 26.2% for diabetic retinopathy. The Chennai Urban Rural Epidemiology Study (Cures I), a population based survey where 4 field fundus photography was performed on 1382 subjects, reported a prevalence ratio of 17.6%.

The rising prevalence ratio is attributed to a change in lifestyle due to urbanization, intake of high calorie and high fat diet, decreased physical activity, and an increased longevity. Indians are more prone to diabetes and its attendant complications making India the diabetic capital of the world. Indians have a genetic phenotype characterized by low body mass index, high upper body adiposity, high body fat percentages and a high level of insulin resistance which are risk factors for diabetes.

Considering the large number of diabetic subjects in India, diabetic retinopathy still poses an enormous public health and economic burden. We need to strengthen our primary healthcare facilities to diagnose and initiate treatment for diabetes and diabetic retinopathy at an early stage.

The DRS and ETDRS have conclusively advocated the role of regular eye examination to ensure early detection and treatment of diabetic retinopathy and thereby prevent severe visual loss. The awareness and adherence to periodic eye checkup is poor even in developing countries. The scenario in developing countries like India is worse. These factors highlight the need for a population based diabetic retinopathy awareness programmes, screening and appropriate counseling. The physicians and ophthalmologists require further awareness and training so that they can educate their own patients. The three level model adopted by our centre was very effective in screening and detecting early cases of diabetic retinopathy. These patients were vigorously counseled and were followed up for 3 years. Any progression in retinopathy could be therefore detected and treated.

References:
Capsular tension rings (CTR) are one of the most important accessories in the armament of cataract surgeons to combat subluxated or compromised integrity of the capsular bag. Almost all cataract surgeons have used the ring at some point or the other and it has saved many from sleepless nights.

CTR can be inserted in the eye either manually or with the help of either disposable or metallic injectors. One of the problems faced during either manual insertion or with the help of current injectors is that the trailing end sometimes get lost in the sulcus and complicates further a complicated situation. Another important point is that, when we inject the CTR by the common current methods, it puts a lot of stress on the remaining zonules and may further weaken or damage them. Some have advocated threading one eye of the CTR segment for easy retrieval if it is dislocated posteriorly.

We needed a design which could overcome these problems, but was not only easy and fast to make but also cheap. Hence, we designed this new CTR delivery system.

### Materials and Method:

Conventional CTR was used. Initially, a 10-0 Nylon suture with straight needle and 16G or 18G IV catheter was used to make the delivery system. The eye of CTR was threaded with suture 10-0 Nylon. CTR was injected into the bag through the main phaco port in a folded manner through 2.2 and 2.8 mm incisions. The sutures were removed only after completion of surgery. **Result:** The CTR insertion was smooth. Threading allowed slow and guided release of CTR in the bag and safe recovery if CTR removal was required in case of PCR. No complications were noted. **Conclusion:** New CTR delivery system is easy to make and use; is reproducible and safe to use. It also allows safe and easy removal preoperatively if need be.

**Key words:** Sub-luxated Cataract, Capsular Tension Ring( CTR), Phacoemulsification.

### Address for correspondence:

Dr. Surya Gupta; Alo Eye Care, FE-10, Salt Lake, Kolkata-106.  
Email: suryagupta@yahoo.com
Figure 1: Threading of the “eyelets” of the CTR with 10-0 Nylon Sutures.

Figure 2: Pulling the CTR inside the IV catheter in a “folded” manner for “Injectable” insertion in the bag.

Figure 3: “Injection” of the CTR inside the Bag.

Figure 4: Exit of the Sutures from the side of the IV catheter, about 1 cm from the tip of the catheter.

Figure 5: Removal of the sutures after completion of the surgery. The sutures are supported away from the margins of the anterior capsule to avoid injury, by a spatula.

Discussion:
CTR have come to the rescue to many surgeons in difficult situations to stabilize the capsular bag but they are not free from complications[3]. CTR being lost in the sulcus while insertions can be very difficult and traumatic to retrieve. Dislocation of CTR during insertion or during surgery after inadvertent posterior capsular rent can be nightmare. Stress on the remaining zonules during insertion in the bag with compromised stability is also something to worry about with current delivery methods[1,2].

This new CTR delivery system tries to overcome most of these complications. The insertion in a folded manner in the bag ensures equal stress in all quadrants of the bag without undue stress in any one segment. This helps in reducing stress in the remaining segments or in areas with weak zonules. Since both the eyes of the CTR are threaded, if need be, the CTR can be removed in a foldable manner by simply pulling the stay sutures and pulling the CTR back into the IV cannula. The stay sutures also ensure that the ends of the CTR are always accessible when dislodged out of the bag or in case of posterior capsular rent, when they need to be removed. The materials used in this new delivery system are freely available and can be used with current phaco incisions. The materials are made of freely available and can be used with current phaco incisions. It’s beauty lies in its simplistic design and the rapidness with which it can be made, when needed. With further design modification and refinement, we hope to improve this further and make phacoemulsification in sub-luxated cataracts more comfortable.

Reference:
Fungal keratitis is a prevalent problem in the eastern region of India. Around 40% to 50% of fungal keratitis require surgery to take care of the infection. Therapeutic deep lamellar keratoplasty, as a modality of treatment, is a relatively recent approach to management of fungal keratitis.

The potential disadvantage of performing lamellar keratoplasty in fungal keratitis is that eradication of the infection may not be complete, leading to recurrence of infection in the graft; advantages include reduced risk of subsequent rejection and graft failure with preservation of recipient endothelium and less risk of secondary endophthalmitis as entry of anterior chamber can be largely avoided.

We present here a case series of 7 eyes of 7 patients in which deep anterior lamellar keratoplasty was done for treatment of fungal keratitis. To our knowledge, this is the first such report from Eastern India.

Materials and methods

Seven eyes of 7 patients undergoing deep lamellar keratoplasty were chosen for analysis. Our selection criteria were culture proven cases of fungal keratitis, non responsive to maximal medical therapy. We excluded cases with anterior chamber involvement or endoeuxudate, except for case 7 in which an endoeuxudate with hypopyon was present.

The age of the patients varied from 19 to 75 years (average age 56.5 years), and comprised of 6 males and 1 female patient, for a period ranging from January to December 2012. Three of the patients gave recent history of eye trauma. All the patients were on antimicrobial therapy before attending our hospital.

Address for correspondence:
Dr Jayanshu Sengupta, Priyamvada Birla Aravind Eye Hospital, Kolkata.
email: jayansu@hotmail.com
1 Ocular Microbiology Division.
2 Cornea and Ocular Surface Disease Clinic, Priyamvada Birla Aravind Eye Hospital, Kolkata, West Bengal.
Surgical Procedure

In all cases a trephine size 0.5 mm larger than the area of fungal corneal infection was chosen. Lamellar debulking of the superficial stroma was done, followed by viscodissection to expose the Descemet's membrane. In the case with a descemetocle, the central surrounding stroma was separated gently by viscodissection, and in the periphery, residual stroma was retained. The host bed was washed with liposomal Amphotericin B 0.15%. Same sized donor tissue, with the DM removed, soaked for 30 minutes in Liposomal Amphotericin B solution, was then sutured onto the host bed. Donor Tissue Characteristics: Pseudophakic, Aphakic tissue, with average age of donors 76.3 years (65-92 years), overall grading of tissue poor, with endothelial status CD 1200/mm², CV 67%, 6A 15%.

Results

Our outcome measures were divided into three classes. Complete success was defined as no recurrence. Qualified success was defined as recurrence controlled by medical and/or surgical therapy without full thickness keratoplasty. Failure was defined as recurrence necessitating full thickness keratoplasty.

There were 3 cases of Aspergillus, 2 cases of Fusarium, 1 case of Alternaria and 1 case of Scedosporium.

Four of the 7 cases (57.14%) were deemed as completely successful, with no recurrence of infection and patients maintaining clear grafts till last follow up (24 months average). There was an average of 4.8 lines of improvement of vision by Snellen's chart. Mean endothelial cell count was 1846/sq mm.

One of the cases in this group developed suture infiltrate at 3 months, which was managed by topical antibacterial drops, and resolved in 3 weeks time with localized scarring. Graft clarity was maintained.

Case No 4, which was a case of Fusarium keratitis, showed recurrence of the infection at 6 weeks. Scrapings taken from the infiltrate grew Fungi on culture. Antifungal treatment (Natamycin 1%, along with oral Ketoconazole 200 mg BD) was started. Conjunctival hooding was performed at 10 days of recurrence. The ulcer healed with scarring and interface haze.

Case No 6 was a case of Scedosporium Keratitis which showed rapid progression after presentation, proceeding to surgery within 48 hrs. We noted recurrence in the graft within 72 hrs postoperatively, which was non responsive to medical therapy, and a full thickness graft had to be performed on the 7th day.

Figure 2: Post operative photographs of 7 cases after therapeutic DLK.

lesions in all patients except case 2 were scraped, for laboratory evaluation, as well as to remove superficial necrotic tissue.
**Outcome**  | **No of cases**
---|---
Complete success | 4
Qualified Success | 1 (Case No 4)
Failure | 2 (Case No 6, Case No 7)

| Organism   | Outcome | Successful | Failure |
---|---|---|---|
Aspergillus | 2 | - | 1 |
Fusarium | 2 (1 qualified success) | - | - |
Alternaria | 1 | - | - |
Scedosporium | - | - | 1 |

**1 yr follow up data**

| Metric | Data |
---|---|
No of lines improved | 4.8 lines |
Adverse Events | - |
Suture infiltrate | 1 case |
Cataract | 1 case |
Graft failure | Present |
Endothelial Counts | 1846/sq mm |
| Data | Non recordable |

**Discussion**

The first treatment for fungal keratitis is the use of antifungal therapy, including oral antifungal therapy. However, unlike the advances in our chemotherapeutic arsenal against bacteria, antifungal agents are few. Most cases require prolonged therapy, and 40-50% of cases progress to surgery.

Conjunctival flaps have been used as a way of treating recalcitrant fungal ulcers. In the study by Sanders, 9 cases of nonresponsive fungal ulcers were treated by conjunctival flaps with favourable results obtained in five of these cases.

The decision to perform a lamellar keratoplasty for infectious keratitis has several advantages and disadvantages. It is a technically difficult procedure to perform in an inflamed eye. In full thickness grafts, however, the risk of introducing the infection into the eye is always present. An additional problem present with large penetrating grafts is immunologic rejection. Thus when a donor graft larger than 8.5 mm is placed, immune reactions are likely to occur, and lead to graft failure. In the recent article by Anshu et al, DALK and PK eradicated infection in 84.6 and 88%
of cases respectively. Recurrence of primary infection occurred in 15.3% and 12% of the DALK and PK group. However in the study, 3 different techniques of stromal dissection was carried out and recurrence occurred in the manual dissection group. In contrast, we carried out viscodissection in all 7 cases in our series.

One of the points to note is that different fungal species appear to grow in different patterns. In many cases, fungal hyphae are arranged in a parallel growth array, or may be perpendicular to the arrangement of corneal collagen lamellae. Fusarium and Aspergillus are the 2 most common fungal pathogens in this case series. Xie et al found that 85% of Fusarium strains grow in a horizontal pattern, while 15% grow perpendicular to corneal lamellae. Aspergillus usually grows perpendicular to the cornea. In our study, one case of Fusarium keratitis was a success and another was a qualified success with recurrence not necessitating TKP. One case of Aspergillus was a failure after DALK.

Penetrating keratoplasty has several other disadvantages including cataract, glaucoma, synechiae formation. The prolonged use of topical steroids is also a concern with PK which would be reduced with all lamellar procedure. The quality of the tissue would also be of less significance for a lamellar procedure, a very important consideration in our country where the tissue supply falls so woefully short of the demand.

A very important point for consideration is the risk of immunologic rejection, especially since these grafts are performed in inflamed vascularized eyes, and are large sized grafts. A second graft may also at times be required for optical purposes, in which case, prior host sensitization increases the chances of rejection.

As we see in our case series, appropriate case selection is mandatory as demonstrated amply in the 7th case where a full thickness procedure would have worked better. Our outcome with Aspergillus keratitis also looks better than that reported in literature.

However, a larger sample size with a control arm is required. Confocal microscopy, if available, may have helped in better case selection by assessment of extent of hyphal spread.

References

Retinoblastoma and Acute Inflammation

Dipankar Das 1,2, Panna Deka 2, Damaris Magdalene 2, Kasturi Bhattacharjee 2, Harsha Bhattacharjee 2, Sumita Sarma Barthakur 2, Manab Jyoti Barman 2, Rushil Kumar Saxena 2, Apurba Deka 2

Abstract: Retinoblastoma (RB) is an embryonic malignant tumour of retinal origin in children. This embryonic neoplasm can have uncontrolled proliferation and the inhibition of apoptosis contribute significantly for the tumour biology. Inflammation is an important constituent of a tumour and its evolution.

We report an unusual case of retinoblastoma in a 3-year old child with evidence of acute inflammation with local iris, focal choroidal and perineural optic nerve invasion. Immunohistochemistry (IHC) for neuron specific enolase (NSE) and p53 were done in the tumour sample.

Key word: Retinoblastoma, differentiation, undifferentiation, acute inflammation.

Retinoblastoma (RB) is a childhood embryonic malignant tumour of retinal origin[1]. Inflammation plays decisive roles at different stages of tumour development, conversion, invasion and metastasis[2]. Inflammation often affects the immune surveillance and response to treatment [2]. Many of the patients with retinoblastoma, chronic inflammations were evident, while, presence of leucocytes within the tumour was observed in the 19th century by Rudolf Virchow, provided the first indication of possible link between inflammation and cancer. [2] It was during last decade; somewhat clear evidence had been obtained that inflammation playing a critical role in tumorigenesis[2-3].

We report a unilateral group E RB in a 3-year old child with focal iris, choroidal and perineural optic nerve invasion with the evidence of acute inflammation in the tumour. Immunohistochemistry (IHC) for neuron specific enolase (NSE) and p53 were positive in the tumour.

Case history

A 3-years old female child presented at a tertiary institute of north east India with a white pupillary reflex in the right eye (OD). She was clinically diagnosed as group E RB in her OD and B scan ultrasound and computed tomography scan of OD showed intraocular densely calcified soft tissue mass. Examination under general anesthesia with a written consent was done on the day of surgery for the confirmation of intraocular RB. Left eye (OS) was found normal. Intraocular pressure was normal in both the eyes.

The specimen was sent to ocular pathology laboratory of the institute. After adequate fixation of eyeball in 10% neutral buffered formalin, it was examined next day. Eyeball was measured anterior posteriorly 22.13 mm, horizontally 21.89 mm, vertically 22.24 mm; cornea was measured horizontally 11.95 mm and vertically 11.00 mm. Optic nerve was measured 12.33 mm in length and 5.23 mm in diameter along with its meninges. Transillumination defect was negative. The globe was sectioned vertically. Exudative fluid was seen in the vitreous cavity with soft whitish tumour; measured 11.43mm X 11.95mm. Lateral calottes were cut separately and were submitted for histopathology. Separate transverse section of the distal end of optic nerve was cut and submitted for evaluation. Gross documentation was done (Figure 1).

Figure 1: Gross documentation of retinoblastoma specimen.

Microscopic study of the specimen in hematoxylin-eosin (H and E) showed normal cornea, anterior chamber, and focal iris involvement in the lateral calottes. There was an endophytic tumour seen in the vitreous cavity with necrosis and calcification. Sclera was normal. Lateral calottes showed choroidal involvement which was more than one-third depth. Acute inflammation was noted in the differentiated, Flexner Wintersteiner (FW) rosette and undifferentiated zone of the tumour. Acute inflammations were seen in the differentiated and undifferentiated zone. Acute inflammatory cells were seen in the lumen of the rosettes and mitoses were seen in the peripheral cells of the rosettes (Figure 2). Leucocytes were seen in the differentiated zone of the tumour disintegrating the rosettes (Figure 3). The rosettes that were involved with inflammation were larger and in some of them, they were in the process of breakdown (Figure 3). One of the calottes showed adjacent peri-neural optic nerve involvement (Figure 4). Cut end of the optic nerve was normal.

IHC was done from paraffin embedded block by antigen retrieval technique for NSE (Anti-NSE, MIG-N3, AM 055-5M, mouse
monoclonal antibody in PBS with carrier protein, BioGenex, Fremont, USA) and p53 Anti-p53 protein, BP 53-12, AM-1950213, mouse monoclonal antibody in PBS in carrier protein, BioGenex, Fremont, USA were done. NSE (Figure 5) and p53 were positive in the sample (Figure 6). For comparative results, positive and negative controls were taken.

**Discussion**

RB, an intraocular tumor, has several important models for study of cancer and constituted much to know about the tumorogenesis[4]. Proliferation and differentiation process in retinoblastoma has various pathways in the inflammatory response against the tumour and its spread[4].

Tumour microenvironment can often largely organized by inflammatory cells which can take a crucial step in neoplastic progression and promoting proliferation, survival, tumour
conversion and migration. Chronic inflammations may be seen in solid tumours, in general and retinoblastoma, in particular.

In our case, we had seen the evidence of acute inflammation. These acute inflammatory cells were seen in differentiated zone, undifferentiated zone and there were disintegration of rosettes by the inflammatory cells. Cellular elements had been found active in conversion of tumour from differentiating form to undifferentiating one within the mass. Mitoses were evident in the peripheral cells of FW rosettes. There were neither previous history of cryotherapy or laser application in the tumour or there was history of any infective foci in the patient for such acute inflammatory response.

RB1 codes for RB protein and it functions as tumour suppressor oncogene by controlling the cell cycle through complex interactions\(^1\)\(^-\)\(^4\). The retinoblastoma protein (pRb), in its hyperphosphorylated form, releases E2 promoter binding factor-1 (E2F 1), which drives cell proliferation. This promoter binding factor involves in the cellular proliferation and apoptosis\(^6\)\(^-\)\(^9\).

IHC for NSE and p53 were done in the sample with positive and negative control. With the development of molecular biology research, it was indicated that p53 tumor suppressor gene plays an important role in DNA transcription, cell growth and proliferation, DNA repair and various metabolic processes\(^9\)\(^-\)\(^10\). In our case, we had got IHC for p53 positive. It had shown p53 positive cases can have poor prognostic factor \(^10\). High risk factors seen in our case was consistent with the IHC finding of p53 and studies from India and abroad had shown similar results \(^5\)\(^-\)\(^8\)\(^,\)\(^10\). Patient is on follow-up with oncologist and we look forward for the survival index in this patient, in future.

References


Modification of Jones Procedure or Lower Lid Shortening Effective in Lower Lid Senile Entropion Correction

Salil Kumar Mandal\(^1\), Aparna Mandal\(^2\), Sanjay Chatterjee\(^3\)

Abstract:

Purpose: Lower lid senile entropion is a common trouble some condition especially in old age. Various surgical procedures have been described, of which many of them are technically difficult and failure or recurrence rate is high. To prevent failure and recurrence a Modification of Jones’ procedure has been introduced. It is safe, technically easy and has a high success rate.

Material and Methods: This is a retrospective non-comparative experimental study comprising of over 60 patients with lower lid senile entropion without significant horizontal lid laxity. The amount of in-roll of the lower lid was assessed first, and then a skin incision was made 6 mm below and parallel to the lower lid margin along its outer two thirds. Once the skin and muscle was incised, the orbital fascia (septum) became exposed at the base of tarsal plate. Plication of this orbital fascia along with lower lid retracter (capsulopalpebral fascia) with 6 – 0 Polyglactin created a permanent horizontal pleat or shortening. Then the skin was tucked along with the plicated complex by 4 – 0 black silk suture. Extra skin and orbicularis muscle may be excised if needed.

Results: In this series of patients the follow-up ranged between 3 to 36 months, with an average of 24 months. Amongst these 4 cases had been overcorrected which was treated by gentle upward massaging. It was counted as failure. In this case series, success rate was 93.33% Conclusion. This Modification of Jones’ procedure (shortening of lid) is one of the best procedures for lower lid senile entropion correction. It is technically easy, there is a clear working field and success rate is high. Moreover it can be done as a day care surgery also.

Keywords: Lid deformity, Entropion, Lid inversion, Lid spasm.

Address for correspondence:
Dr. Salil K Mandal, Medical College Kolkata, 88 College Street Kolkata -700073, West Bengal, India.

e-mail: Salil-dum@live.com
Lower lid entropion is a common condition in the elderly; the prevalence increases steadily with age. The condition may be mild or severe, and it usually involves the entire eyelid margin. In entropion (en =in; trepín =to turn) there is inversion of the lid margin, so that the eye lashes are in contact with the globe. The main danger of entropion is the constant irritation of the eye by the lashes which may cause conjunctivitis, keratitis, and even corneal ulcer. In entropion the lid margin and cilia are normal but the whole border of the eye lid is turned inward. Entropion differs from trichiasis and distichiasis. In trichiasis, there is distortion of the lid margin or misdirection of the eye lashes towards the globe. Distichiasis is a congenital anomaly with a double row of eye lashes, of which posterior row is usually turned inward\(^8,10,14,15\). Lower lid senile entropion develops as result of weakening of the orbital septum (fascia) and lower lid retractor complex, lid laxity and overriding of preseptal orbicularis fibers on the tarsal and pretarsal fibers\(^2,4,8\).

### Material and Methods

**Inclusion criteria**
1. Senile lower lid entropion
2. Age more than 50 years

**Exclusion criteria**
1. Spastic entropion.
2. Mechanical entropion
3. Cicatricial entropion
4. Age less than 50 years

This is a retrospective non-comparative study comprising of sixty cases from the year 2005 to 2009, of which 38 cases were females and 22 cases were males. All cases were operated under local anesthetic agent 2% lignocaine with adrenaline (1:100,000). In most of the cases the age ranged between 50 – 65 years. Mean age was 55 years. Out of all of the cases 80% had pre existing corneal opacity and 70% had immature senile cataract. All the patients having minimal horizontal laxity of the lower lid were included in the study.

**Surgical Procedure**

Topical: 3-4 drops of lignocaine 4% are put at an interval of 2-3 minutes in the conjunctival cul-de-sac. Local infiltration: This was done with 2% lignocaine with adrenaline (1:100,000). Avoid in cases of hypertension, arrhythmias and other cardiac problems. 0.5 to 1 ml is injected with the help of a 26 G. disposable needle near the lateral canthus, 2 – 3 mm below the lash line, so that the anesthesia goes over the tarsal plate and sub muscular plane. A cotton swab is taken and by applying firm pressure the anesthetic agent is made to spread all over the lower tarsus in smooth fashion.

The aim is to unroll the lower lid so that lashes no longer are in contact with the globe. First we assessed the amount of lower lid in-rolling that needs to be corrected by plication of the orbital septum (fascia) along with lower lid retractor complex and then excise of redundant skin, and orbicularis muscle. Finally the plicated orbital septum – lower lid complex is tucked with skin. Wound is then closed by additional interrupted silk sutures for good apposition.

The skin incision is made 6 mm below and parallel to the outer two third of the lid margin. It is carried upwards beyond the lateral canthus. Incision is deepened and undermined upwards and downwards to expose the orbicularis muscle. This is split horizontally at the base of the tarsus. Now the orbital septum is exposed by blunt dissection. It can be identified by its white glistening surface. The amount of in rolling of the lower lid is assessed, then 6-0 polyglaclin interrupted vertical mattress sutures or continuous interlocked.

Sutures are applied over the orbital septum (fascia) along with lower lid retractor complex which is adherent intimately with the fascia. Tightening causes plication of orbital fascia along with the lower lid retractor complex. The length of this plicated complex is approximately 5-6 mm. Then a 4-0 black silk suture, with a cutting needle engages the skin going in, tucks in the plicated complex and emerges out of the opposite skin edge. Then an additional skin suture with 4 – 0 black silk is applied for good wound closure. Usual post-operative advice e.g. systemic antibiotics, analgesic, and anti-inflammatory agent is prescribed. Removal of sutures is done after 7 days.

**Results**

All the cases were followed during the post-operative period up to 24 months. In the entire series of cases, lower lid margin was well opposed to the globe. In none of the cases did the lower lid lashes touch the globe or cornea. Six cases had mild epiphora. The lower lid scar mark was prominent for the initial two months, but it gradually faded by use of topical of steroid ointment. Over correction was occupied in 4 cases which were then treated by upward massaging. Over correction was counted as primary failure, giving a success rate of 95%.

**Discussion**

Lower lid entropion is a common condition particularly in the elderly. It may cause a continuous gritty sensation, watering, redness and difficulties in opening the eye. Entropion is more frequent in women than in men. This disparity may be related to the relatively smaller (on average) tarsal plates of women. In this study also females were more commonly involved (57%). Entropion results from the vector mechanical effect of an atrophied or smaller-than-average (partially or fully disinserted) tarsal plate being overcome by the normal or increased tone
of the preseptal / pretarsal orbicularis muscle. Mechanism of the senile entropion includes horizontal laxity of the eyelid, weakened orbital septum or fascia and lower eyelid retractor complex (capsulopalpebral fascia), vertical shortening of the posterior lamella of the eyelid, and spasm or over activity of the orbicularis oculi muscle\textsuperscript{1, 3-7}. Incision made over skin 6 mm below and parallel to the outer two third of the lid margin and curve upward beyond the lateral canthus. Then incision deepen to incise the orbicularis muscle. Orbital septum exposed, continuous or interrupted 6-0 polyglactin suture applied to plicate the orbital fascia and inferior retractor together causes vertical shortening of the lid. (Figure 2 and Figure 3).

Tightening of the continuous suture (Schematic 5b) and interrupted( schematic 5c) along with inferior retractor causes plication of orbital fascia and lower lid retractor complex (Fig 5d schematic 1 and II). It causes vertical shortening of the lower lid. Tucking of skin, muscle with plicated fascia by 4-0 black silk (Figure5d schimatic-III and Figure-5e).
Previously in general, lower lid entropion correction was less successful than ectropion. When we applied the Jones’ procedure for lower lid correction (tucking with silk suture and plication of inferior retractor) some of the cases failed and recurrence was about 25%. But a comparative study between Jones’ with Weis procedure shows that in Jones’ procedure failure rate was about 16% and in Weis procedure failure was about 48%. The probable explanation of failure is plication or shortening of lower lid made by interrupted silk suture. Initially it is corrected due to tissue fibrosis but after removal of the silk suture or after a certain period of time, in rolling occurs again. This is because the tissue fold made by this silk suture is not a permanent fold. Due to frequent forceful closure of both lids, the tissue pleat made by the non-absorbable suture eventually slips, resulting in in-rolling of the lid. Another explanation is that plication made on only inferior retractor by 6-0 polyglactin suture is not sufficient enough, or sometimes it is difficult to identify anatomical structures, thereby not permitting strengthening of orbital septum. After observing this for a long period we then applied 6 – 0 Polyglactin as a delayed absorbable suture as a very close vertical mattress or continuous inter-locked suture that shorten the lower lid. This is JONES’ procedure modified by SALIL. The modification is that plication made by this silk suture is not a permanent pleat. Due to frequent forceful closure of both lids, the tissue pleat made by the non-absorbable suture eventually slips, resulting in in-rolling of the lid. Another explanation is that plication made on only inferior retractor by 6-0 polyglactin suture is not sufficient enough, or sometimes it is difficult to identify anatomical structures, thereby not permitting strengthening of orbital septum. After observing this for a long period we then applied 6 – 0 Polyglactin as a delayed absorbable suture as a very close vertical mattress or continuous inter-locked suture to make a permanent fold over the orbital septum (fascia) and under lying lower lid retractor complex. The overlying skin was tucked along with the plicated complex using 4 – 0 black silk suture. In this study we have shown that the correction of the lower lid entropion is 93.33%, which was success rate in this study. Some cases were over corrected, which was due to wrong assessment preoperatively and they were treated by upward gentle massage. Over correction accounted as primary failure. There was no incidence of recurrence8-13. In this study we made a permanent pleat in the orbital fascia by using a 6 – 0 polyglactin suture that helps in shortening of the lower lid by pulling it down and causing out-rolling of the lower lid. Then this pleat was anchored to the skin by 4 – 0 black silk.

The redundant skin and orbicularis, if needed was excised. Here, the skin suture to the tarsus, with no intervening orbicularis muscle, in order to prevent the preseptal muscle from riding up the indented scar in the lower lid, is slow to disappear. The skin incision is made in the lateral two third of the lid because an incision in the medial two thirds would interfere with the normal function of the lacrimal pump. Therefore, unless the integrity of the punctum and canaliculus are compromised, this does not happen. Moreover mild over correction in the lateral half of lid is mandatory so that it would not interfere with the tear drainage system. In our opinion this is JONES’ procedure modified by SALIL. The modification is the pleat made on orbital fascia (septum) and under lying lower lid retractor complex by a 6 – 0 polyglactin vertical mattress or continuous inter-locked suture that shorten the lower lid. This plicated orbital fascia along with the lower lid retractor complex is eventually anchored to the skin by 4 – 0 black silk. There is no need to dissect the orbital septum and identify the inferior retractor complex, because it is intimately adherent with the orbital septum. During plication it automatically comes along with the septum. Removal of part of orbicularis is required to disturb the regular muscle fibres and prevent its spasm that causes the occurrence of entropion. This simple and easy procedure can be practiced by any ophthalmologist as a day care procedure and carries minimal chance of failure.

**References**


**Neuroretinitis following Chicken Pox: A Case Report**

**Mandal D*, Raval V**, Das D**, Biswas J**

**Abstract:**

Chicken pox is usually a benign self limiting infectious disease with few anterior segment involvements like conjunctivitis, keratitis, episcleritis, scleritis, iridocyclitis and glaucoma. Retinal involvement manifests as retinitis, vitritis, neuroretinitis and retinal detachment. Neuroretinitis is a rare complication of...
An immunocompetent 22 year old male presented with complaint of sudden, painless diminution of vision in the right eye for 1 week. He gave a history of chickenpox 2 weeks prior to onset of visual symptoms. Systemic examination revealed vesicular rash typical of chickenpox on the face and the extremities (Figure 1).

Ocular examination revealed a best corrected visual acuity of 20/200; <N36 in the right eye and 20/30; N6 in the left eye. There was a relative apparent pupillary defect in the right eye. Intraocular pressure by Goldmann applanation tonometry was 14 mm Hg in both the eyes. Anterior segment was normal. Fundus examination of the right eye showed hyperemic disc, retinal edema, resolving exudates at the macula and multiple flame shaped hemorrhages in the posterior pole (Figure 2).

**Figure 1:** Rash of chickenpox on face.

**Figure 2:** Neuroretinitis Right eye.

Left eye fundus was normal. A provisional diagnosis of viral neuroretinitis due to varicella zoster virus was made and the patient was started on oral Acyclovir 800 mg 5 times per day with oral prednisolone 40 mg once a day for 2 weeks. On follow up visit after 1 week, visual acuity improved to 20/30 in the right eye and fundus showed resolving disc and retinal oedema.

**Discussion:**

Very few case reports of posterior segment involvement due to varicella zoster virus (VZV) infection in children and adults have been reported.

Biswas et al have reported a case of neuroretinitis following chickenpox virus infection in a 23 years old male. Fundus showed swollen and hyperaemic optic disc with elevation of the peripapillary retina and few hard exudates in the macular area in a stellate configuration. The patient was started on oral Acyclovir 800 mg five times a day and prednisolone 40 mg once a day for two weeks.

Capone and Meredith had also reported a case of unilateral central visual loss in a 2 year old child caused by chickenpox retinitis with optic neuritis resulting in a poor visual outcome.

Neuroretinitis is a particular form of optic neuritis characterized by swelling of the optic disc, appearance of peripapillary and macular hard exudates. Gass emphasized that the condition commonly occurs in children and young adults and that up to 50% of them had a viral illness usually affecting the respiratory tract a few weeks before the onset of the visual symptoms. Neuroretinitis is thought to be an infectious or immune-mediated process that may be precipitated by a number of different agents. Differential diagnosis for the etiology of neuroretinitis includes leptospirosis, cat scratch fever, influenza, mumps and chickenpox. No definite

**Key words**: Chickenpox, varicella zoster, neuroretinitis, Acyclovir.
guidelines for the management of such cases are available due to
the limited number of cases reported. Acyclovir has been used
orally or intravenously in these patients. As these lesions resolve
with or without Acyclovir, the precise role is not clear.

References:
neuroretinitis with oral acyclovir: A case report. Ocular
2. Capone A, Meredith TA. Central visual loss caused by
1992;113:592-593.
3. Gass JDM. Diseases of the optic nerve that may stimulate
1997;83:766-769.
Photo Gallery

Indranil Deb (1-6), Arnab Biswas (7-12).

1A & B: Accommodative esotropia: Surgery not required in all cases of squint. Esotropia corrected with hypermetropic glass.

2 A, B, C & D: Congenital esotropia- squint not corrected with glass, classical cross fixation—on covering right eye, fixation by left eye (this excludes lateral rectus paresis).

3: Fish bone injury.
4: Maggots in a necrotic intraocular tumour.

5 A, B, C & D: Marfan’s syndrome: Bilateral upward subluxation of lens with webbing between long spider-like fingers, arm-span more than height.

6: Phthiriasis palpebrarum.
7. Sebaceous horn upper lid.

8. Astrocytoma.

9. Coloboma disc and choroid.
10. Ankyloblepharon.

11. Giant magnet to remove IOFB.

12. Steven Johnson's Syndrome.
Severe adverse events associated with local anaesthesia in cataract surgery: 1 year national survey of practice and complications in the UK.


Lee RM, Thompson JR, Eke T.

Abstract

Background: Recent years have seen a major change in practice of local anaesthesia (LA) for cataract surgery.

Aims: (1) To estimate current usage of LA techniques for cataract surgery, (2) to estimate the incidence of severe adverse events associated with each LA technique, (3) to compare with our previous 2003 study.

The Effect of Cataract Surgery on Circadian Photoentrainment : A Randomized Trial of Blue-Blocking versus Neutral Intraocular Lenses

Ophthalmology, October 2015, Volume 122, Issue 10, Pages 2115–2124

Adam Elias Brøndsted, Birgit Sander, Cand Scient, Birgitte Haargaard, Henrik Lund-Andersen, Poul Jennisen, Steen Gammeltoft, Line Kessel

Abstract

Purpose: Cataract decreases blue light transmission. Because of the selective blue light sensitivity of the retinal ganglion cells governing circadian photoentrainment, cataract may interfere with normal sleep–wake regulation and cause sleep disturbances. The purpose was to investigate the effect of cataract surgery on circadian photoentrainment and to determine any difference between blue-blocking and neutral intraocular lenses (IOLs).

Design: The study was a single-center, investigator-driven, double-masked, block-randomized clinical trial.

Participants: One eye in 76 patients with bilateral age-related cataract eligible for cataract surgery was included.

Methods: Intervention was cataract surgery by phacoemulsification. Patients were randomized to receive a blue-blocking or neutral IOL.

Main Outcome Measures: Primary outcome was activation of intrinsic photosensitive ganglion cells using post-illumination pupil response (PIPR) to blue light from 10 to 30 seconds after light exposure as a surrogate measure. Secondary outcomes were circadian rhythm analysis using actigraphy and 24-hour salivary melatonin measurements. Finally, objective and subjective sleep quality were determined by actigraphy and the Pittsburgh Sleep Quality Index.

Results: The blue light PIPR increased 2 days (17%) and 3 weeks (24%) after surgery (P < 0.001). The majority of circadian and sleep-specific actigraphy parameters did not change after surgery. A forward shift of the circadian rhythm by 22 minutes (P = 0.004) for actigraphy and a tendency toward an earlier melatonin onset (P = 0.095) were found. Peak salivary melatonin concentration increased after surgery (P = 0.037). No difference was detected between blue-blocking and neutral IOLs, whereas low preoperative blue light transmission was inversely associated with an increase in PIPR (P = 0.021) and sleep efficiency (P = 0.048).

Conclusion: Cataract surgery increases photoreception by the photosensitive retinal ganglion cells. Because of inconsistency between the significant findings and the many parameters that were unchanged, we can conclude that cataract surgery does not adversely affect the circadian rhythm or sleep. Longer follow-up time and fellow eye surgery may reveal the significance of the subtle changes observed. We found no difference between blue-blocking and neutral IOLs, and, because of the minor effect of surgery in itself, an effect of IOL type seems highly unlikely.
Cataract Surgery Outcomes in Uveitis: The Multicenter Uveitis Steroid Treatment Trial

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Purpose: To assess the visual outcomes of cataract surgery in eyes that received fluorocinolone acetonide implant or systemic therapy with oral corticosteroids and immunosuppression during the Multicenter Uveitis Steroid Treatment (MUST) Trial.

Design: Nested prospective cohort study of patients enrolled in a randomized clinical trial.

Participants: Patients that underwent cataract surgery during the first 2 years of follow-up in the MUST Trial.

Methods: Visual outcomes of cataract surgery were evaluated 3, 6, and 9 months after surgery using logarithmic visual acuity charts. Change in visual acuity over time was assessed using a mixed-effects model.

Main Outcome Measures: Best-corrected visual acuity.

Results: After excluding eyes that underwent cataract surgery simultaneously with implant surgery, among the 479 eyes in the MUST Trial, 117 eyes (28 eyes in the systemic, 89 in the implant group) in 82 patients underwent cataract surgery during the first 2 years of follow-up. Overall, visual acuity increased by 23 letters from the preoperative visit to the 3-month visit (95% confidence interval [CI], 17e29 letters; P < 0.001) and was stable through 9 months of follow-up. Eyes presumed to have a more severe cataract, as measured by inability to grade vitreous haze, gained an additional 42 letters (95% CI, 34e56 letters; P < 0.001) beyond the 13-letter gain in eyes that had gradable vitreous haze before surgery (95% CI, 9e18 letters; P < 0.001) 3 months after surgery, making up for an initial difference of -45 letters at the preoperative visit (95% CI, -56 to -34 letters; P < 0.001). Black race, longer time from uveitis onset, and hypotony were associated with worse preoperative visual acuity (P < 0.05), but did not affect postsurgical recovery (P > 0.05, test of interaction). After adjusting for other risk factors, there was no significant difference in the improvement in visual acuity between the 2 treatment groups (implant vs. systemic therapy, 2 letters; 95% CI, -10 to 15 letters; P = 0.70).

Conclusion: Cataract surgery resulted in substantial, sustained, and similar visual acuity improvement in the eyes of patients with uveitis treated with the fluorocinolone acetonide implant or standard systemic therapy.

Ultra-Wide-Field Fundus Autofluorescence in Multiple Evanescent White Dot Syndrome

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Hideaki Hashimoto B, Shoji Kishi

Purpose: To observe the progression of affected lesions using ultra-wide-field fundus autofluorescence (FAF) in multiple evanescent white dot syndrome.

Design: Retrospective, observational case series.

Methods: Institutional setting, patient population: 14 eyes of 13 patients (mean age, 35.8 years) with acute disease unilaterally, observation procedures: Patients underwent ultra-wide-field FAF, spectral-domain optical coherence tomography (SD OCT), multifocal electrotretinography (mfERG), and Goldmann or automated perimetry; the best-corrected visual acuity (BCVA) and refractive error were measured, main outcome measure: Ability of ultra-wide-field FAF to detect lesions with greater sensitivity compared with color fundus photography.

Results: Ultra-wide-field FAF imaging enabled improved visualization of the affected lesions and showed that the core lesion was in the posterior fundus involving the peripapillary retina and posterior pole and surrounded by hyper-autofluorescent spots outside the vascular arcade. The posterior lesions expanded rapidly and peripheral spots spread farther peripherally and reached a maximal extent during the acute stage. During follow-up, the peripheral hyper-autofluorescent spots resolved and then hyper-autofluorescence of the posterior fundus gradually faded. SD OCT showed diffuse disruption of the photoreceptor inner segment/outer segment junction (IS/OS) in the posterior fundus during the acute stage. The correlation between the IS/OS abnormality and hyper-autofluorescent areas was unclear. The disrupted IS/OS was restored with normalization of the FAF.

Conclusion: Ultra-wide-field FAF showed that the lesions arise from the peripapillary retina and the posterior pole and spread peripherally in a centrifugal manner during the acute stage. The hyper-autofluorescent spots faded from the periphery in a centripetal manner.
Enlargement of Foveal Avascular Zone in Diabetic Eyes Evaluated by En Face Optical Coherence Tomography Angiography.


Takase N, Nozaki M, Kato A, Ozeki H, Yoshida M, Ogura Y.

Abstract

Purpose: To evaluate the area of the foveal avascular zone (FAZ) detected by en face OCTA (AngioVue, Avanti OCT; Optovue) in healthy and diabetic eyes.

Methods: Retrospective chart review of patients who underwent fundus examination including en face OCTA. Eyes with proliferative diabetic retinopathy and history of laser photocoagulation were excluded. The FAZ area in the superficial and deep plexus layers were measured and evaluated using ImageJ software.

Results: The FAZ area in the superficial layer was 0.25 ± 0.06 mm in healthy eyes (n = 19), whereas it was 0.37 ± 0.07 mm in diabetic eyes without retinopathy (n = 24) and 0.38 ± 0.11 mm in eyes with diabetic retinopathy (n = 20). Diabetic eyes showed statistically significant FAZ enlargement compared with healthy eyes, regardless of the presence of retinopathy (P < 0.01). The FAZ area in the deep plexus layer was also significantly larger in diabetic eyes than in healthy eyes (P < 0.01).

Conclusion: Our data suggest that diabetic eyes show retinal microcirculation impairment in the macula even before retinopathy develops. En face OCTA is a useful noninvasive screening tool for detecting early microcirculatory disturbance in patients with diabetes.

Endoresection technique with/without brachytherapy for management of high posterior choroidal melanoma: extended follow-up results.


Garcia-Arumi J, Leila M, Zapata MA, Velázquez D, Dinares-Fernandez MC, Tresserra F, Corcostegui B.

Abstract

Purpose: To evaluate the long-term efficacy and safety of endoresection for high posterior choroidal melanoma.

Methods: Retrospective nonrandomized interventional case series. Forty-one patients had endoresection as primary treatment for posterior choroidal melanoma. Of these, 21 patients had adjuvant brachytherapy. The inclusion criteria were tumour thickness ≥8 mm, base diameter <15 mm, and posterior tumours not extending anterior to the equator. Main outcomes measures were enucleation rate, visual outcome, surgical complications, local recurrence, metastasis, and mortality.

Results: Mean follow-up time was 102.5 months. Mean preoperative best-corrected visual acuity was 20/100. Mean tumour thickness was 9.8 mm (range, 7.7-13.5 mm; standard deviation, 1.7 mm), mean base diameter was 9.9 mm (range, 5-15 mm; standard deviation, 2.8 mm). At the latest visit, 36 patients (87.8%) still retained the eye. Mean postoperative best-corrected visual acuity was 20/1,625. Retinal detachment was the main postoperative complication (28.9%). At completion of follow-up, 12% of patients had phthisis bulb, and 3 developed chronic hypotony. Five patients (12.2%) had local tumour recurrence; none of them had received brachytherapy as initial treatment. At 5 years of follow-up, 3 patients (7.3%) had liver metastasis. On Kaplan-Meier analysis at 10 years, all-cause mortality was 7.3% and specific mortality because of melanoma was 2.4%.

Conclusion: Endoresection of high posterior melanomas was not associated with a higher risk of metastasis, death, or local recurrence than other reported techniques used to treat similar melanomas.
Reproducibility of retinal nerve fiber layer measurements across the glaucoma spectrum using optical coherence tomography

Jayesh Vazirani, Sushmita Kaushik, Surinder Singh Pandav, Pramod Gupta

Abstract

Purpose: The purpose was to determine intra-session and inter-session reproducibility of retinal nerve fiber layer (RNFL) thickness measurements with the spectral-domain Cirrus optical coherence tomography (OCT) (SD-OCT) in normal and glaucomatous eyes, including a subset of advanced glaucoma.

Materials and Methods: RNFL measurements of 40 eyes of 40 normal subjects and 40 eyes of 40 glaucomatous patients including 14 with advanced glaucoma were obtained on the Cirrus OCT* (Carl Zeiss Meditec, Dublin, CA, USA) five times on 1-day (intra-session) and on five separate days (inter-session). Intraclass correlation coefficient (ICC), coefficient of variation (COV), and test-retest variability (TRT) values were calculated for mean and quadrant RNFL in each group separately. Reproducibility values were correlated with age and stage of glaucoma.

Results: For intra-session reproducibility, the ICC, COV, and TRT values for mean RNFL thickness in normal eyes were 0.993, 1.96%, and 4.02 µm, respectively, 0.996, 2.39%, and 3.84 µm in glaucomatous eyes, and 0.996, 2.41%, and 3.70 µm in advanced glaucoma. The corresponding inter-session values in normal eyes were 0.992, 2.16%, and 4.09 µm, 0.995, 2.62%, and 3.98 in glaucoma and 0.990, 2.70%, and 4.16 µm in advanced glaucoma. The mean RNFL thickness measurements were the most reproducible while the temporal quadrant had the lowest reproducibility values in all groups. There was no correlation between reproducibility and age or mean deviation on visual fields.

Conclusion: Peripapillary RNFL thickness measurements using Cirrus OCT demonstrated excellent reproducibility in normal and glaucomatous eyes, including eyes with advanced glaucoma. Mean RNFL thickness measurements appear to be the most reproducible and probably represent the best parameter to use for longitudinal follow-up.

Topical cyclosporine to control ocular surface disease in patients with chronic glaucoma after long-term usage of topical ocular hypotensive medications

Eye (2015) 29, 808-814; doi:10.1038/eye.2015.40; published online 10 April 2015

M Saini, R Dhiman, T Dada, R Tandon and M Vanathi

Abstract

Purpose: To evaluate changes in ocular surface and central corneal sub-basal nerve fiber layer (SBNFL) after topical cyclosporin therapy in chronic glaucoma patients on long-term topical antiglaucoma therapy.

Methods: A prospective comparative study of ocular surface evaluation of chronic glaucoma patients on long-term topical antiglaucoma therapy treated concurrently with a topical cyclosporine 0.05% twice daily for 6 months and controls was done. The study parameters evaluated at recruitment and at the 6-month follow-up included details of topical antiglaucoma medications, visual acuity, intraocular pressure, ocular surface evaluation parameters (TBUT, Schirmer’s I, ocular surface staining scores and ocular surface disease (OSD) index score (OSDI), central corneal sensation (Cochet Bonnett aesthesiometer), and central confocal microscopy to study the SBNFL density (SBNFLD).

Results: Thirty-two eyes of 16 patients with chronic glaucoma and 30 eyes of 15 normal subjects as controls were studied. Mean TBUT, pre/post CsA treatment was 8.67 ± 3.01/12.24 ± 1.83 s (P = 0.007). Mean conjunctival /corneal staining scores pre/post CsA treatment were 3.38+1.93/1.50 + 0.718 (P = 0.00) /5.19 ± 1.82/1.81 ±0.78 (P = 0.098), respectively. Mean OSDI pre/post CsA treatment scores were 30.63+14.61/14.76 + 6.06 (P = 0.007); Mean corneal sensations scores pre/post CsA treatment were 4.64 + 0.46/4.94 + 0.39 (P =0.002). Central corneal SBNFLD pre and post CsA treatment was 8811.35 ± 2985.29/10335.13 ± 4092.064 µm/mm2 (P = 0.0001).

Conclusion: Schirmer’s test, ocular surface staining scores, OSDI, corneal sensations, and corneal SBNFLD showed a statistically significant improvement following a 6-month concurrent topical CsA therapy.
Abstract

Objective: To assess the efficacy and short-term safety of levodopa as adjunctive treatment to patching for amblyopia.

Design: Randomized, placebo-controlled trial.

Participants: One hundred thirty-nine children 7 to 12 years of age with residual amblyopia resulting from strabismus, anisometropia, or both combined (visual acuity [VA], 20/50-20/400) after patching.

Methods: Sixteen weeks of oral levodopa or placebo administered 3 times daily while patching the fellow eye 2 hours daily.

Main Outcome Measures: Mean change in best-corrected amblyopic-eye VA at 18 weeks.

Results: At 18 weeks, amblyopic-eye VA improved from randomization by an average of 5.2 letters in the levodopa group and by 3.8 letters in the placebo group (difference adjusted for baseline VA, +1.4 letters; 1-sided P=0.06; 2-sided 95% confidence interval, -0.4 to 3.3 letters). No serious adverse effects from levodopa were reported during treatment.

Conclusion: For children 7 to 12 years of age with residual amblyopia after patching therapy, oral levodopa while continuing to patch 2 hours daily does not produce a clinically or statistically meaningful improvement in VA compared with placebo and patching.

Comparison of lateral rectus muscle re-recession and medial rectus muscle resection for treatment of postoperative exotropia.


Lueder GT, Galli M.

Abstract

Purpose: To compare the outcomes of unilateral lateral rectus muscle re-recession and medial rectus muscle resection for treatment of recurrent or persistent exotropia.

Design: Retrospective nonrandomized clinical trial.

Methods: Setting: Hospital-based clinical practice.

Patient Population: Forty patients with recurrent or persistent exotropia following bilateral lateral rectus muscle recessions.

Intervention: Fourteen patients were treated with unilateral medial rectus muscle resection and 26 with unilateral lateral rectus muscle re-recession.

Main Outcome Measures: Outcomes were considered successful if the patients had deviations less than 10 prism diopters (PD) at last follow-up. All patients were followed for at least 1 year postoperatively.

Results: The mean preoperative deviations were 17.4 PD in the medial rectus muscle resection group and 18.1 PD in the lateral rectus muscle re-recession group. Successful outcomes were achieved in 9 of 14 patients (64%) treated with medial rectus muscle resection and 19 of 26 patients (73%) treated with lateral rectus muscle re-recession. There was no statistically significant difference between these outcomes. Mean follow-up was 4.5 years in the medial rectus muscle resection group and 2.9 years in the lateral rectus muscle re-recession group.

Conclusion: Surgery on a single muscle can be used to treat moderate-angle recurrent or persistent exotropia. Unilateral re-recession of the lateral rectus muscle and medial rectus muscle resection have equivalent success rates.
Anatomic and visual function outcomes in paediatric idiopathic intracranial hypertension.


Gospe SM, Bhatti MT, El-Dairi MA.

Abstract

Background: There is a paucity of literature describing risk factors for vision loss in paediatric idiopathic intracranial hypertension (IIH). We investigate the final visual function, spectral domain optical coherence tomography (SD-OCT) and enhanced depth imaging (EDI)-OCT findings in children with papilledema caused by IIH.

Methods: Medical records of 31 patients with paediatric IIH (age ≤17 years) were retrospectively reviewed. Optic disc photographs on presentation and automated perimetry, SD-OCT and EDI-OCT imaging on final follow-up visit were statistically analysed to identify patient characteristics and anatomic findings associated with irreversible vision loss.

Results: Permanent visual acuity or visual field loss developed in 19% of study eyes. Papilledema of modified Frisén grade ≥3 on presentation was highly predictive of permanent vision loss (p<0.001), while associations between pubertal status and visual function outcome failed to reach statistical significance. SD-OCT revealed optic atrophy in 13% and photoreceptor loss in 19% of eyes, with both findings highly associated with vision loss (p<0.0001). Optic disc drusen was noted in 48% of study eyes by EDI-OCT but was not found to be predictive of visual outcome.

Conclusion: Clinical observation of high papilledema grade on presentation is predictive of poor visual outcomes. Vision loss is associated not only with optic atrophy but also with photoreceptor damage. Interestingly, a high proportion of study eyes had optic disc drusen, which was not associated with vision loss, but can be a diagnostic challenge in distinguishing true papilledema from pseudopapilledema.

Levodopa as a possible treatment of visual loss in nonarteritic anterior ischemic optic neuropathy.


Lyttle DP, Johnson LN, Margolin EA, Madsen RW.

Abstract

Purpose: To determine the clinical effectiveness and potential neuroprotection of levodopa in improving visual acuity, visual field, and retinal nerve fiber layer (RNFL) thickness in eyes affected by NAION.

Methods: Retrospective cohort study involving 59 eyes of 59 participants with NAION who were evaluated within 15 days of NAION onset. Participants received 25 mg carbidopa/100 mg levodopa three times daily with meals for 12 weeks (levodopa group) or were untreated (control group). Best-corrected visual acuity converted to logMAR, mean deviation (MD) threshold sensitivity on automated perimetry, and mean RNFL thickness on optical coherence tomography (OCT) were assessed. The primary outcome was the categorization of eyes into improved visual acuity (by 0.3 logMAR difference), worsened visual acuity (by 0.3 logMAR difference), or no change in visual acuity. The proportions in each category were compared between the levodopa and control groups.

Results: Among participants with 20/60 or worse initial visual acuity, levodopa-treated participants had significant improvement (P<0.0001) in the mean change from initial to final logMAR visual acuity of -0.74±0.56 (95% CI, -0.98 to -0.50), while the mean change for the control group at -0.37±1.09 (95% confidence interval estimate, -1.00 to +0.26) was not significant (P=0.23). A significant difference between groups was observed (P=0.0086) such that 19/23 (83%) in the levodopa group improved and none got worse, as compared with 6/14 (43%) in the control group improving while four (29%) worsened. The change in visual field MD and RNFL thickness on OCT showed no significant difference at P=0.23 and P=0.75 respectively. No levodopa-treated participant had any adverse event from the levodopa.

Conclusion: Treatment within 15 days of onset of NAION with levodopa improved central visual acuity by an average of 6 lines on Snellen acuity chart. Levodopa may promote neuroprotection of the maculopapular retinal ganglion cell fibers in NAION.
Are You Missing an Entropion? The Test of Induced Entropion 2.

Ophthal Plast Reconstr Surg. 2015 Sep 30. [Epub ahead of print]


Abstract

Purpose: Entropion is the inward turning of the eyelid. The most common type of entropion is involutional, a combination of eyelid laxity, lower eyelid retractor weakness, and orbicularis oculi override. Unfortunately, the condition can be intermittent and remain undiagnosed, leading to ocular surface damage. In suspected cases, clinicians can use provocation techniques to elicit the condition. These include the forced closure of the eyelids, the tetracaine provocation test, and the test of induced entropion (TIE). The authors present an alternative diagnostic test: the TIE-2.

Methods: The TIE-2 test is performed by asking the patient to look down while the examiner holds the upper eyelid open and high to prevent downward movement. The patient is then asked to close their eyelids as tightly as possible. An entropion will then be induced. To illustrate the technique, the authors present 2 patients seen in the oculoplastics clinic with symptoms and signs suggestive of intermittent entropion, in whom conventional provocation tests were unsuccessful.

Results: In both cases, conventional methods did not provoke an entropion. However, the TIE-2 test successfully induced an entropion, leading to the correct diagnosis and appropriate management.

Conclusion: When there is suspicion of intermittent entropion that is not revealed with existing provocation tests, the TIE-2 is a simple and useful diagnostic tool.

The Role of Routine Biopsy of the Lacrimal Sac During Dacryocystorhinostomy Surgery.


Nash M, Skippen B, Gal A, Benger R.

Abstract

Purpose: To assess the role of routine histopathological evaluation of the lacrimal sac wall when performing dacryocystorhinostomy (DCR) surgery.

Methods: A retrospective review was conducted of the histology findings in lacrimal sac biopsies, taken routinely, in an external-approach DCR series. This is a single surgeon (RB), single pathologist (AG) consecutive series. The histopathology reports were reviewed and collated. Each patient’s medical history and risk factors for malignancy were recorded. The surgeon documented any abnormal lacrimal sac appearance at the time of surgery.

Results: No patient in this series of 245, in whom 254 histology specimens were taken, recorded a significant pathological result that was not anticipated from pre-operative assessment, or from the appearance of the lacrimal sac intra-operatively.

Conclusion: The reported recommendation for routine histopathological evaluation of the lacrimal sac wall when performing DCR surgery is not supported by this consecutive series. The authors recommend histopathological evaluation only in the setting of pre-existing clinical suspicion of malignancy, or an abnormal intra-operative appearance of the lacrimal sac.
Efficacy of Intracameral Moxifloxacin Endophthalmitis Prophylaxis at Aravind Eye Hospital.


Haripriya A, Chang DF, Namburar S, Smita A, Ravindran RD.

Abstract

Purpose: To compare the rate of postoperative endophthalmitis before and after initiation of intracameral (IC) moxifloxacin for endophthalmitis prophylaxis in patients undergoing cataract surgery.

Methods: A consecutive case series of 1,056 patients screened for cataract surgery from 2007 to 2012 was retrospectively analyzed. The level of preoperative and postoperative dry eye and the responsiveness to topical cyclosporine A treatment were assessed.

Results: One eye of each patient was randomly selected. A total of 642 eyes progressed to surgery: 524 (81.6%) and 118 (18.4%) underwent LASIK and PRK, respectively. Of 81 (7.7%) diagnosed as having dry eye, 55 were deemed potential candidates and optimized for refractive surgery. Thirty-seven patients with moderate dry eye were treated with topical cyclosporine A prior to surgery (mean duration: 3.2 ± 2.1 months; range: 1 to 12 months). After cyclosporine A treatment, 28 (75.7%) eyes underwent LASIK, 4 (10.8%) eyes underwent PRK, and 5 (13.5%) eyes were not operated on due to failed treatment of dry eye. Postoperative refractive surgery-induced neurotrophic epitheliopathy (LINE in LASIK) was noted in 132 (27.3%) and 12 (11.1%) eyes that underwent LASIK and PRK, respectively. Topical cyclosporine A was prescribed in 79 LASIK-induced and 3 PRK-induced dry eyes. After 12 months or more of cyclosporine A treatment, 5 (6.1%) eyes continued to have dry eye symptoms or signs.

Conclusion: Topical cyclosporine A treatment is effective therapy for optimizing patients for refractive surgery and treatment of new onset or worsened dry eye after surgery.

Topical cyclosporine A treatment in corneal refractive surgery and patients with dry eye.


Torricelli AA, Santiago MR, Wilson SE.

Abstract

Purpose: To evaluate preoperative and postoperative dry eye and the effect of cyclosporine A treatment in patients screened for corneal refractive surgery and treated with photorefractive keratectomy (PRK) or LASIK.

Methods: A consecutive case series of 1,056 patients screened for corneal refractive surgery from 2007 to 2012 was retrospectively analyzed. The level of preoperative and postoperative dry eye and the responsiveness to topical cyclosporine A treatment were assessed.

Results: One eye of each patient was randomly selected. A total of 642 eyes progressed to surgery: 524 (81.6%) and 118 (18.4%) underwent LASIK and PRK, respectively. Of 81 (7.7%) diagnosed as having dry eye, 55 were deemed potential candidates and optimized for refractive surgery. Thirty-seven patients with moderate dry eye were treated with topical cyclosporine A prior to surgery (mean duration: 3.2 ± 2.1 months; range: 1 to 12 months). After cyclosporine A treatment, 28 (75.7%) eyes underwent LASIK, 4 (10.8%) eyes underwent PRK, and 5 (13.5%) eyes were not operated on due to failed treatment of dry eye. Postoperative refractive surgery-induced neurotrophic epitheliopathy (LINE in LASIK) was noted in 132 (27.3%) and 12 (11.1%) eyes that underwent LASIK and PRK, respectively. Topical cyclosporine A was prescribed in 79 LASIK-induced and 3 PRK-induced dry eyes. After 12 months or more of cyclosporine A treatment, 5 (6.1%) eyes continued to have dry eye symptoms or signs.

Conclusion: Topical cyclosporine A treatment is effective therapy for optimizing patients for refractive surgery and treatment of new onset or worsened dry eye after surgery.

Efficacy of Intracameral Moxifloxacin Endophthalmitis Prophylaxis at Aravind Eye Hospital.


Haripriya A, Chang DF, Namburar S, Smita A, Ravindran RD.

Abstract

Purpose: To compare the rate of postoperative endophthalmitis before and after initiation of intracameral (IC) moxifloxacin for endophthalmitis prophylaxis in patients undergoing cataract surgery.

Methods: The electronic health record data for each of the 3 groups were analyzed, and the postoperative endophthalmitis rates were statistically compared. The cost of endophthalmitis treatment (groups 1 and 2) and the cost of IC moxifloxacin prophylaxis (group 2) were calculated.

Main Outcome Measures: Postoperative endophthalmitis rate before and after initiation of IC moxifloxacin endophthalmitis treatment cost.

Results: Manual, sutureless, small incision cataract surgery (M-SICS) accounted for approximately all of the 75 937 cataract surgeries in the charity population (97%), but only a minority of the 40 777 private surgeries (21% M-SICS; 79% phacoemulsification). Thirty eyes in group 1 (0.08%) and 6 eyes in group 2 (0.02%) were diagnosed with postoperative endophthalmitis (P < 0.0001). The group 3 endophthalmitis rate was 0.07% (29 eyes), which was also higher than the second group's rate (P < 0.0001). There were no adverse events attributed to IC moxifloxacin in group 2. The total cost of treating the 30 patients with endophthalmitis in group 1 was virtually identical to the total combined cost in group 2 of routine IC moxifloxacin prophylaxis and treatment of the 6 endophthalmitis cases.

Conclusions: Routine IC moxifloxacin prophylaxis achieved a highly significant, 4-fold reduction in postoperative endophthalmitis in patients undergoing M-SICS. Compared with previous studies, having such a high volume of patients undergoing surgery during a relatively short 14-month time period strengthens the conclusion. This study provides further evidence that moxifloxacin is an effective IC prophylactic antibiotic and suggests that IC antibiotics should be considered for M-SICS and phacoemulsification.
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