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MANUAL SMALL INCISION CATARACT SURGERY

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Videos:

Dr Deepak Megur completed his post graduate diploma in ophthalmology from Minto Eye Hospital Bangalore in 1998 and FRCS in 1999 from Edinburgh university. He is in private Practice since 2000.

Presently he is consultant at Megur Eye Care Centre, Bidar and heads the Cataract and Glaucoma departments.

He specializes in complex cataract surgeries and has a keen interest in Angle Closure Glaucoma.

He keenly pursues clinical research, academics and has presented scientific research papers in various national and international conferences and is invited as faculty in many State and National level conferences. He has participated as an instructor in instruction courses at ASCRS 2013, ASCRS 2015, APAO 2017, AIOC 2015 and AIOC 2017 meetings.

He has presented papers, posters and videos at ASCRS 2013, ASCRS 2015, ESCRS 2014, APACRS 2014, APAO 2017 and at AIOC conferences.

He has 3 publications in national & state peer reviewed journals.

Awards & Recognitions:

He is recipient of

"**Basheer Mekhr**i 2nd ***best paper award***" in 2002 Karnataka Ophthalmic Society Conference (KOSC) Manipal,

"M. M. Joshi over all best paper award" in 2008 KOSC Shimoga,

Best paper of the cataract session in All India ophthalmic society Conference 2009 at Kolkata,

Best Video Award in 2010

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KOSC Udupi,

Best Video award at 2010 Glaucoma Society of India conference New Delhi.

Best Video Award at KOSC 2013 (Hassan).

Best Paper of the session at APACRS 2014 at Jaipur.

Ratnakar Mullerpaten award 3rd best paper at KOSC 2016 Udupi.

Best Cataract Surgery Paper KOSC 2017 - Bangalore

He is a reviewer for Indian Journal of Ophthalmology and Karnataka State Journal of Ophthalmology.

Apart from his academic achievements, he is a teacher par excellence. His videos included in the playlist show the clarity of concepts from basic to deepest aspects of Ophthalmology. The entire team of ISMSICS wishes him the best in life and academics.

Success isn't always about greatness. It's about consistency. Consistent hard work leads to success. Greatness will come.
-Dwayne Johnson

Videos:

- Management of DM Detachment
- Traumatic Subluxated Cataract with Vitreous Prolapse
- DM Detachment during Cataract Surgery: A Nightmare Revisited!
- Pooling of Fluid during Cataract Surgery: The quick fix.
- Traumatic Cataract with Ruptured Anterior and Posterior Capsule
- Intraoperative Miosis; Iris hooks to the rescue
- Eye Surgery in 4K Resolution
- Insecticide Induced Keratopathy
- IOL Explant and Exchange
- Phaco + Anterior Vitrectomy to manage dense Asteroid Hyalosis
- Managing a calcified capsule in a Hypermature Cataract
- Dense Cataract with Weak Zonules: Management with Capsule hooks and CTR
- Posterior Capsular Cleaning/Flushing

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Manual SICS: Boon for Prevention and Management of Corneal Decompensation

The ultimate goal of a good cataract surgery is good vision. Postoperative clear cornea is imperative to achieve the desired clarity of vision and patients comfort.

Protection of corneal endothelium during intraocular procedure is utmost important for cornea to remain compact and thus transparent.

Corneal endothelial cells are post - mitotic and divide rarely, if at all, in the post - natal human cornea. Wounding of the corneal endothelium, as from trauma or from surgical insults, prompts healing of the endothelial monolayer by sliding and enlargement of adjacent endothelial cells, rather than mitosis. Endothelial cell loss, if sufficiently severe, can cause endothelial cell density to fall below the threshold level needed to maintain corneal deturgescence. This threshold endothelial cell density varies considerably amongst individuals, but is typically in the range of 500 - 1000 cells/mm^2. Typically, loss of endothelial cell density is accompanied by increases in cell size variability (polymegathism) and cell shape variation (polymorphism). Corneal edema can also occur as the result of compromised endothelial function due to intraocular inflammation or other causes.

Symptoms of pseudophakic corneal oedema include the following:

- Poor vision
- Haloes around point sources of light
- Pain
- Foreign body sensation
- Photophobia

Pseudophakic bullous keratopathy (PBK) refers to the development of irreversible corneal edema as a complication of cataract surgery. As corneal edema progresses and worsens, first stromal and then intercellular epithelial edema develops. Epithelial edema is associated with the development of bullae; hence, the name bullous keratopathy. Stromal edema affects vision much less and causes less light scatter than epithelial edema; epithelial edema involves the corneal surface and disrupts the normally smooth and regular tear film. The development and subsequent rupture of corneal bullae on the densely innervated corneal surface cause pain and photophobia.

Prevention of Intraocular insult:

Risk factors for developing a corneal oedema post cataract surgery are hard cataract that requires more phaco energy and operative time, Traumatic cataract surgery and Fuchs' endothelial dystrophy. A careful slit lamp examination helps to identify Fuchs' dystrophy as bilateral presence of endothelial guttae along with pigments especially in the central cornea. Specular microscopy supports the presence of guttae and a decreased endothelial cell density. Also dysfunctional cells (abnormal shape, size) can be identified with specular microscopy as a potential risk to corneal decompensation post surgery.

During the cataract surgery, the main objective is to reduce the mechanical trauma to endothelium by the instruments and also by the nucleus, which results in the loss of endothelial cells.

Manual SICS is a perfect choice for an atraumatic cataract surgery for it being:

- A closed globe surgery with deep anterior chamber during all the procedures – as compared to ECCE
- Steady and Controlled surgery – as compared to turbulence as caused by the phaco machine
- Variations like Blumenthal, Sandwich expression and Intra tunnel phaco fractures make sure that the nucleus is never in contact with endothelium during expression.

Early diagnosis and Management of Descemets' Membrane detachment :

Possibility of a descemets' membrane detachment (DMD) should strongly be suspected and carefully looked for during slit lamp examination in case of an uneventful cataract surgery with post op oedema. ASOCT aids the diagnosis and the confirms orientation of the DMD to plan the location of gas injection for Descemetopexy. Air or isoexpansile concentration (14%) of C3F8 can be used for descemetopexy. Most of the DMD can be settled with air descemetopexy with only a few diagnosed in later post op period, Descemets' membrane having fixed fold and previous failed descemetopexy require a long tamponade which an be achieved with C3F8.

Steps of descemetopexy:

- Sideport is made in the area of attached DM preferably opposite to the DMD
- Aqueous is let out of the anterior chamber to create space for the gas
- Gas is injected through sideport or 30G needle through the stroma oriented in way that expanding bubble flattens the detached DM.
- Full fill is achieved for 10min and then exchanged

with BSS to leave about 70% AC filled with Gas.

Medical Management of Pseudophakic corneal oedema :

This is mainly aimed for symptomatic relief with the use hyperosmolar agents, lubricants and topical steroids to control inflammation. Non-resolving cases should be observed for 3 months before labeling them as endothelial decompensation, which requires a more definitive procedure like corneal transplant.

Corneal transplant remains the mainstay of the surgical treatments. Full thickness penetrating keratoplasty though considered a gold standard has been gradually getting replaced by Endothelial Keratoplasty due to its distinct advantages of being a

- Closed globe surgery
- Faster visual recovery
- Less induced astigmatism
- Less suture related complication
- Corneal sensations remain intact
- Stronger globe integrity
- Low allograft rejection rate

Though with few challenges like a fair learning curve and an increased primary failure rate during the learning curve, endothelial keratoplasty is becoming the procedure of choice for pseudophakic bullous keratopathy. Few contraindiacation to enumerate being significant host corneal scarring, pre existing irregular astigmatism like in case of a failed graft, silicone oil in AC, PAS/ disorganised anterior chamber. Aphakia is a relative contraindication but can successfully managed in combination with a secondary iol like glued IOL.

Combined Cataract and Cornea transplant:

Since Fuchs' endothelial dystrophy is a major and important cause for corneal decompensation after cataract surgery, it is important to identify cases, which have a high propensity to develop oedema postoperatively.

Preoperatively central corneal thickness is a much more reliable criteria for endothelial dysfunction. As a thumb rule, corneas thinner than 630µ, cataract surgery can be done alone with use of high viscosity viscoelastics. In case of a thicker cornea, a combined cataract and transplant procedure should be planned.

For a good Endothelial Keratoplasty, A watertight chamber is required for good lenticule adherence and a large incision to minimize the endothelial loss during the insertion of the lenticule after an uncomplicated cataract surgery. Both of these criteria are wonderfully acquired by Manual small incision cataract surgery.

- Manual SICS ensures a controlled cataract surgery in oedematous hazy cornea with stable PCIOL
- A sufficiently large sclera corneal incision to minimize the endothelial loss without the need of multiple sutures and astigmatism, thus giving an optimal visual outcome
- A watertight chamber at the conclusion of the surgery and minimal intraoperative turbulence

Thus learning and practicing a good Manual Small Incision Cataract Surgery is prudent for every ophthalmologist to give a good and early visual rehabilitation after cataract surgery.

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