Cataract surgery – Where are we today and what do we need?

Advances and recent techniques in ophthalmology have significantly brought down the rate of avoidable blindness in India. However, cataract (71.2%) remains the leading cause of visual impairment in the population aged ≥50 years in India, as noted in a survey conducted by the National Programme for Control of Blindness and Visual Impairment (2015–2019).[1] The goal is no longer just being able to make the patient ambulatory but to achieve emmetropia across all distances. The two common barriers to the acceptance of cataract surgery in developing countries like India include availability and affordability.

Recently, there has been a wide paradigm shift in the surgical techniques and management options for cataract management.

Evolution in cataract surgery has never stopped since the time Sushruta (India) performed the surgery in around 600 BC for cataracts using couching, where an instrument was used to dislocate the cloudy lens from its anatomical position into the vitreous cavity.[2] Ancient Greek and Egyptians used a similar technique called needling in which the cataract was sliced into multiple small pieces, and the wait was needed for the body to absorb them. These techniques did not remove the cataract from the eye but dislodged them from the visual axis, giving patients mildly better vision (and aphakia). The extracapsular cataract extraction (ECCE) was first performed by Jacques Daviel (France) in 1747.[2] The first documented intracapsular cataract extraction (ICCE) was done by Samuel Sharp (England) in 1753.[2] Then came the biggest revolution in cataract surgery when Sir Harold Ridley (England) inserted the first intraocular lens (IOL, an artificial acrylic lenticulus made of polymethyl methacrylate or PMMA) into a human eye on November 29, 1949.[3] Blumenthal technique of manual ECCE was first described in 1992 and the author stated that the nucleus can be removed through a 5- to 7-mm scleral or limbal incision.[4] In 1999, Ruit described a new manual small-incision cataract surgery (MSICS) technique using a V-shaped capsulotomy and an irrigating Simcoe cannula to remove the nucleus at Tilganga Eye Center in Kathmandu, Nepal.[5]

There have been various advancements in IOLs, ophthalmic viscosurgical devices, instruments, operating microscopes, machines, technology, and medicines and this evolution is likely to continue in the coming years. The surgical wound size has also evolved from 12 mm for ICCE to 9–12 mm for ECCE to 6 mm in small-incision cataract surgery (SICS). With the advent of phacoemulsification, this further decreased significantly to around 2.2 to 2.8 mm.[6] Microincision cataract surgery (MICS) needs an incision that is not more than 2 mm. Along similar lines of decreasing the incision size for better astigmatism control, speedy recovery, and less risk of infection, the surgeon has been modifying their surgical techniques. To add to the list, temporal scleral tunnel, manual phacofragmentation by double nylon loop, snare technique, and Kanas tri-sector for nucleus fragmentation are a few other modifications.[4] Recently a phacofracture technique using a viscoelastic cannula was described in conjunction with a 2-mm incision by Sahu *et al*.[7]

The IOLs have advanced in multiple aspects including the lens design, material, and function. PMMA was the preferred optic material since 1986 and then came the silicone and acrylic IOLs in 1994.[6] PMMA IOLs are still in use especially in challenging intraoperative situations including sulcus fixation of IOL or in developing countries where affordability is still a challenge. IOL design has also evolved from monofocal to monofocal toric and premium IOLs including multifocal IOLs.

Phacoemulsification is the accepted standard in the developed world. Femtosecond and artificial intelligence in cataract surgery are recent topics of discussion. But can everyone afford this? Is there a need for us to look back to the past and modify the surgical technique which can give us equivalent results?

This issue has been specially dedicated to MSICS; keeping in mind that whatever development happens in cataract surgery, MSICS will never lose its charm especially when it has also evolved so much over the years. We often hear surgeons discussing how during a certain complication, phacoemulsification was converted to MSICS during surgery but we never hear the reverse. MSICS is a surgery that can be done in complicated situations like hard brown cataracts, poor endothelial cell count, post-corneal transplant surgery, and so on. It is a low-cost, small-incision form of ECCE that has the advantage of a self-sealing sutureless wound. The issue emphasizes that rehabilitation in MSICS is quicker and may have shorter healing times due to the lack of suture-related issues. MSICS is considerably faster, less expensive, and less dependent on expensive technology than phacoemulsification. High-volume surgery can be learned by surgeons in a short period and the learning curve is shorter than the learning curve for phacoemulsification. How can one use premium IOLs in MISCS and give emmetropia to the patient across all distances is also discussed. Management of preoperative astigmatism in MSICS is also emphasized.

We have tried to cover all the crucial aspects of MSICS in this issue, and hopefully this will expand the understanding of MSICS, increase the utilization of this technique, and inspire innovations in MSICS across the world.

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