

Cataract surgery: The journey thus far

The journey of cataract surgery began as early as 800 BC when “couching” entailed the use of a sharp-tipped instrument to push the cloudy lens into the vitreous cavity.^[1] Since then, cataract surgery has evolved through leaps and bounds with extracapsular cataract extraction, small incision manual cataract surgery (SICS), phacoemulsification, and femtosecond laser cataract surgery as a few of the landmark milestones.

Phacoemulsification was introduced by Charles D Kelman in 1967 after being inspired by his dentist’s ultrasound probe.^[2] This allowed sutureless corneal incisions with faster visual recovery and increased patient comfort. Although phacoemulsification has consolidated its footing as the surgical procedure of choice, SICS still has its place in a developing nation such as ours, with its increased patient load and a dearth of technology in remote areas.

Femtosecond laser-assisted cataract surgery is the latest advancement and has helped elevate cataract surgery into a refractive procedure.^[3] It allows automation of the most critical and delicate steps of the procedure enhancing visual outcomes. It offers the advantage of self-sealing corneal incisions which intuitively reduce the risk of postoperative infection, arcuate keratotomies to debulk corneal astigmatism, precise capsulotomies leading to more precise effective lens positions and nuclear fragmentation with subsequent reduction of effective phacoemulsification time.

Parallel to the evolution of surgical techniques for cataract removal, various advancements in lens replacement technology ensued. The era of intraocular lenses (IOLs) began on February 8, 1950, when Sir Harold Ridley permanently left an artificial lens in the eye.^[4] Since then, our understanding of IOLs has evolved with advancements in IOL power calculation and optics. IOL power calculation is a critical factor in achieving precise refractive outcomes. Atypical cases such as extremes of ametropia, corneas with prior laser correction, penetrating keratoplasty, or biomechanical weakness such as keratoconus require additional care while calculation the IOL power. Advances in IOL optics include the advent of foldable aspheric profile lenses and toric and multifocal lens implants. Corneal astigmatism of 1.25 D or more is prevalent in approximately 30% of the eyes undergoing cataract surgery emphasizing the need for toric implants.^[5,6] Multifocal implants provide distinct foci for both distance and near vision allowing greater spectacle independence postoperatively. However, loss of contrast and dysphotopsia are some of the challenges that still need to be overcome. The precision of pairing femtosecond cataract surgery with a multitude of premium IOLs offers greater visual quality and freedom from spectacles postoperatively. However, various factors must be considered to optimize outcomes with these implants.^[7]

Surgical adjuncts have improved the ease of surgery, especially in complex cases. The use of dyes to stain the anterior lens capsule and vitreous in the event of a capsular dehiscence enable better visualization and subsequent management. Ophthalmic viscoelastic devices help maintain chamber stability and provide corneal endothelial protection from the dissipated phacoemulsification energy. The advent of a continuous curvilinear capsulorhexis was perhaps one of the simplest yet most rewarding inventions allowing a safe phacoemulsification and an in-the-bag IOL implantation.^[8] Various useful adjuncts including hooks and rings to mechanically stretch the suboptimally dilating pupils and ring segments to anchor the subluxated bags have evolved. These help achieve superior results in compromised eyes, which were earlier not possible.

Despite the various advancements in cataract surgery, postoperative endophthalmitis remains a dreaded complication. A number of developments in the preoperative and intraoperative prophylaxis for infection have evolved which may merit review of current department protocols. Clinicians should be aware of the evolving spectrum of pathogens and antibiotic susceptibilities and tailor the management of patients accordingly.

As cataract surgery is an ever-evolving field, it is imperative to be constantly updated with the various advancements. The concept of this special issue was envisaged by us to offer a comprehensive overview into the nuances of modern-day cataract surgery. Over the past few months, we have collected, edited, and compiled articles from prominent national and international faculty. Newer surgical techniques and recent advances have additionally been alluded to.

It was a pleasure to bring together this cataract special issue, and I sincerely hope the readers find it a useful addition to their preexisting wealth of knowledge.

Mahipal Sachdev

Chairman and Medical Director, Centre for Sight, B-5/24, Safdarjung Enclave, New Delhi - 110 029, India.
E-mail: drmahipal@gmail.com

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About the author



Dr. Mahipal Singh Sachdev, an alumnus of and a former faculty at the Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, is an ophthalmic entrepreneur with deep academic passion. He received specialty training in Cornea at the Georgetown University, USA. He is the founding Chairman and Medical Director of Centre for Sight, a nation-wide network of 51 specialty eye hospitals. Dr Sachdev was one of the youngest to chair the All India Ophthalmological Society Scientific Committee; he was also the Secretary and President of Delhi Ophthalmological Society, and Secretary and Chairman, Scientific Committee of the Intraocular Implant and Refractive Society of India. Dr. Sachdev was honored with Padmashri award by the Government of India in 2007 for his contributions to Ophthalmology. Dr Sachdev is the Guest Editor for this Cataract Special Issue of Indian Journal of Ophthalmology. He is also the Managing Editor of the Journal.