Editorial

Evolution of Cataract Surgery in Pakistan over the Past Four Decades

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Cataract is one of the leading causes of reversible blindness worldwide.[1] In Pakistan reversible blindness due to cataract remains the leading cause due to increase in aging population, poverty and comparatively lesser surgical facilities.[2] The prevalence of cataract blindness was higher in women than men (1.80% versus 1.67%, p<0.001). The prevalence of cataract causing <6/60 in eyes was 5.0% (95% CI 4.7%, 5.2%), which projects to an estimated 3 560 000 eyes with a visual acuity of <6/60 caused by cataract in Pakistan (year 2003). This number was projected to increase to 7380 000 by the year 2020.[3]

We have witnessed massive transformation in cataract surgery during the last 50 years from traditional intracapsular cataract extraction (ICCE) to the latest, innovative, and highly skill full approaches like phacoemulsification with premium (Toric, Trifocal & EDOF) intraocular lens (IOL) implants. This article gives a brief review of this journey with miraculous advancements in cataract surgery, reducing the overall cataract load in the country as well as improving the quality of masses with a better-quality vision.

According to latest research, there were more cataract surgeries performed in women than men with a male-to-female ratio of 0.95.[4] About 98.9% of all cataract surgeries were performed with intraocular lenses, while 63.9% were performed by phacoemulsification. About 17.7% of cataract surgical services were provided in the government sector (including Forces), while nongovernmental organizations and the private sector contributed to 82.3%. Pakistan achieved a national CSR of 5307 which is almost double the CSR determined in 2002.[4]

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Ever since the creation of Pakistan till early 1980s, Intracapsular cataract extraction (ICCE) remained the primary surgical technique to treat mature cataracts only, though couching was still being practiced in a few remote areas. ICCE was extensively performed in public and charity hospitals without AC-IOL implants. Although ICCE would restore navigational and some degree of functional vision, it was associated with a prolonged recovery period and was frequently followed by serious blinding complications like retinal detachment and keratopathy.

The extracapsular cataract extraction (ECCE)was introduced in Pakistan in 1984 as a big advancement in cataract surgery for better visual outcome. Rigid posterior chamber lens (PC-IOL)implants were started in 1986. ECCE with rigid PC-IOL implants resulted in providing better and near natural vision to the patients. In addition, the risk of serious complications like vitreous loss, retinal detachment and corneal decompensation was fairly reduced compared with ICCE.

Transformation from ICCE to ECCE was a big challenge. Multiple workshops were conducted for the ophthalmologists for learning ECCE techniques during ophthalmic conferences under the auspices of Ophthalmological Society of Pakistan (OSP) at various cities across the country.[3,5] Better visual outcomes with ECCE resulted in reduced reliance on postoperative aids.

Phacoemulsification with monofocal foldable IOL implants was a huge jump in the management of cataract in Pakistan during 1994. It was a revolution that transformed cataract surgery into a minimally invasive procedure under topical anaesthesia.[6] It reduced the recovery period to few days and brought almost natural distant vision with minimal spectacle dependence. This innovation significantly reduced recovery period and postoperative complications.[5] It was quickly accepted and practiced by the dynamic ophthalmologists due to quick recovery, day care surgery with no hospitalization as well as reduced risk

of complications. However, it met an intense resistance initially from various ophthalmologists on behalf of increased cost of phaco machines, prolonged learning curve and per-operative complications like posterior capsular rents, vitreous loss, nucleus drop and corneal decompensation. Despite this resistance, this procedure rapidly became a popular technique as the Phaco machines' availability and quality improved and training courses conducted by OSP produced more highly skilled phaco surgeons.[7]

Femtosecond laser-assisted cataract surgery (FLACS) is another innovation in cataract surgery in which minimal or no phaco power is used resulting in clear cornea post-operatively. This advancement further improved the high-quality visual outcome of cataract surgery.[8]

Advancements in the fields of IOL technology, biometry and phaco techniques together brought a revolution in the visual outcomes of cataract surgery. Rigid monofocal IOLs of ECCE era were gradually replaced by foldable lOL's implanted through small incisions. Although multifocal IOLs were being implanted off and on a few centers since early 1990s, commercial availability started in 2005 in the developed world and2006 in Pakistan. Toric IOLs became available in Pakistan in 2008 to address the issue of astigmatism.[9] This progress led to high quality vision with no or minimal spectacle dependence for near and distance vision but intermediate vision anddysphotopsia like higher order aberrations (HOA), glare and contrast sensitivity were still to be addressed. The issue of intermediate distance was addressed by the evolution of trifocal IOLs in Pakistan in 2018.[9] Issue of dysphotopsia was addressed by introduction of Extended Depth of Focus (EDOF) IOL implants in 2020, though near vision was slightly compromised with them. However, the latest Presbyopia correcting monofocal EDOF (Alcon IQ Vivity) IOLs have almost addressed this issue as well.[10] However, the issue of contrast sensitivity remains to be resolved.

Biometry techniques to assess IOL power implants started in Pakistan in late 1980s starting from Ultrasonic biometry (contact and immersion) based on axial length (AL) and keratometery.[11] Biometry had also evolved during the past 40 years. Ultrasonic biometry was gradually replaced by optical biometry for more precise and accurate IOL power calculations using keratometry, axial length (AL) and anterior chamber depth (ACD). Latest optical biometers with upgraded varieties e.g., ZEISS IOL Master 500 and 700) have further improved IOL power calculations even in eyes with dense cataracts and previous refractive surgeries.[12] These advancements in biometry have been instrumental in improving the visual outcome in patients with complex visual requirements.

Cataract surgery has witnessed a revolutionary transition during the past 50 years in Pakistan, both in reducing the quantity of cataract load as well as improving quality of vision after cataract surgery. There have been rapid and progressive innovations in IOL power calculation and cataract surgery almost parallel with the developed countries. Transition from ICCE to FLACS and from rigid AC-IOLs to latest premium IOLs has been exponential. The widespread adoption of advanced cataract surgery techniques has significantly improved visual outcomes in Pakistan.[13]

Certainly, there is a definite requirement to provide the up-to-date cataract surgical services to the remote areas of the country. Fortunately, several NGOs have fairly addressed this issue by extending their services of advanced cataract surgery to these areas through their outreach programs including highly equipped satellite operation theaters during their Eye Camps.

Conflict of Interest

Author declared no conflict of interest.

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