

To study the Visual Outcome and Complications of Small Incision Cataract Extraction (SICS) with Intra Ocular Lens implantation (IOL)

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ABSTRACT

Background: Cataract is one of the most commonly performed surgery all over the world. Worldwide, 285 million people are visually impaired, 39 million are blind and out of these people, 18 million had blindness due to cataract. 82% of all blind above the age of 50 years live in developing countries. Globally about 15 million cataract operations are performed annually.

Aim: To study the visual outcome and complications of small incision cataract extraction (SICS) with intra ocular lens implantation (IOL).

Methods: This retrospective study was conducted in the Federal Government Services Hospital, Islamabad from 1st January 2012 to 31st December 2012. 500 cases of SICS+IOL were included in the study. Data was analyzed on SPSS 17.

Results: 500 subjects aging 40-80 years having uncomplicated cataract underwent extensive ophthalmic examination before and after surgery. Mean age at surgery was 64 years with female predominance of 54.6%. Post-operative uncorrected visual acuity (UCVA) was 6/18.50.6% (253) improved to 6/12 or more with spherical correction and 32.4% (162) improved to 6/12 or more with cylindrical correction, 8% patients developed Elschnigs pearls, 8% had irregular pupils. Astigmatism was noticeably low ranging from +/-0.75 to +/-2.75 cylindrical correction. Surgically induced astigmatism calculated by simple subtraction. The study showed reduced health care costs, reduced postop inflammation, reduced astigmatism and early refractive stability.

Conclusion: Good results can be obtained with small incision cataract surgery and intraocular lens implantation in the developing world. SICS with IOL is a safe procedure in expert hands.

Keywords: Cataract, small incision, cataract extraction, Elschnigs pearls.

INTRODUCTION

Cataract comes from the Greek word *καταράκτης* (kataráktēs) meaning the fall of water¹. Cataract is the leading cause of blindness. Cataract affects more than 22 million Americans over the age 40. At the age 75, about 70% of people have cataracts and, as the U.S. population's expected age increases, more than 30.1 million Americans are prone to have cataracts by the year 2020. The most common surgery performed in the America today is cataract surgery².

Worldwide, 285 million people are visually impaired, 39 million are blind and out of these people, 18 million had blindness due to cataract. 82% of all blind above the age of 50 years live in developing countries³. Globally about 15 million cataract operations are performed annually, an increase of 5

million in the next 5 years expected by health experts⁴. About 570,000 adults are estimated to be blind (<3/60) as a result of cataract in Pakistan, and 3,560,000 eyes have a visual acuity of <6/60 because of cataract⁵. The prevalence of bilateral cataract blindness (VA <3/60) among people aged ≥50 years was 4.8% (95% CI: 3.8% to 5.9%), which is highest reported in Pakistan as well as elsewhere⁶.

A huge backlog of cataract blindness exists in the developing world. Various affordable cataract surgical techniques dealing with this backlog are currently used in different parts of the world⁴. Pakistan, being the sixth populous, developing country in the world and is situated in the World Health Organization's (WHO) Eastern Mediterranean Region⁷. It has declining growth in gross domestic product (GDP) and near doubling of its population living below the poverty line⁸. Manual small-incision cataract surgery (MSICS; also SICS or SECCE) is an appropriate surgical technique employed in the developing country⁹. The Idea was to provide latest micro surgical facilities to indigent patients who need good visual and cosmetic results.

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PATIENTS & METHODS

This retrospective study was conducted in the Federal Government Services Hospital, Islamabad from 1st January 2012 to 31st December 2012. 500 cases of SICS+IOL were included in the study. Non probability/ convenient sample of 500 patients above the age of 40 with uncomplicated cataract were included in the study. Planned SICS with IOL was performed by unsutured 6.5 to 7 mm scleral tunnel incision in all cases. 52% (260) patients for right eye and 48% (240) were operated for left eye. Follow-up was conducted on first day, 1st month, 3 months and then on yearly basis. Postoperative assessment included uncorrected and corrected visual acuity (VA), manifest refraction, papillary excursion, intra ocular pressure (IOP), slit lamp examination, lens epithelial cell (LE Cells) migration behind the lens (Elschnigs pearls), fundoscopy, any complication and patients satisfaction level.

500 patients age between 40 to 80 years included in the study. Those with corneal problems, optic pallor, high myopia, hypertension and retinal changes were excluded from the study.

RESULTS

Total number of patients in our study was 500. Mean age at surgery was 64 years with female predominance of 54.6%. Preoperatively, all patients were assessed for visual acuity. 49% patients (245) had hand movement (HM), 40% patients (200), had counting finger (CF) and 11% patients (55) had pre-operative vision of 6/60. Percentages of involvement of eye, previously operated at other places and patients with only one eye are shown in table 1.

Table 1.

Total	500
Male	227 (45.4%)
Female	273 (54.6%)
Right eye	260 (52%)
Left eye	240 (48%)
One eyed person	47 (9.4%)
Previously operated	60 (12%)

Table 2: Pre-operative visual acuity.

HM	245	49%
CF	200	40%
6/60	55	11%

Postoperative uncorrected visual acuity in 392 patients (83%) was 6/18 out of which, 253(50.6%) patients improved to 6/12 or more with spherical

correction. 8% patients develop Elschnigs pearls. 7% had irregular pupil & 2% lost follow up or reported dead. Among all patients, house wives (265) and farmers (153) were happy & did not want glasses. 15% teachers and industrial workers required corrective glasses. Out of total of 500 patients, 7% were not satisfied from the outcome of their treatment. 162 patients (32.4%) having uncorrected 6/18, improved to 6/12 vision with cylindrical correction ranging between +/- 0.50 to +/- 2.75. 48 patients (9.6%) improved with 0.50 to 1.00 cylindrical lens. 53 patients (10.5%) utilized -1.00 to 1.50 cylindrical lens. 41 patients (8.2%) needed 1.50 to 2.00 cylinder and 20 patients (4%) improved to 6/12 vision with 2.00-2.75 cylindrical lens. Surgically induced astigmatism calculated by simple subtraction.

Table 3: Astigmatism. cylindrical correction of 162 patients.

0.5 – 1.00	48 (9.6%)
1.00 – 1.5	53 (10.5%)
1.5 – 2.00	41 (8.2%)
2.00 – 2.75	20 (4%)

This group of patients having visual acuity as CF-HM is much benefited with SICS with IOL as far as visual improvement to 6/18 to 6/12 is concerned.

DISCUSSION

SICS is appropriate surgical procedure for the treatment of cataracts in developing countries¹⁰. This technique is effective for any types of cataracts. It is faster, less expensive, and less technologically dependent¹. Manual small incision cataract surgery (MSICS) achieve excellent visual outcomes with low complications rate. Common postoperative complications were minimal. Corneal edema and hyphaema was noticed in few patients which improved within 1 week without intervention¹¹. 3% patients had corneal edema and 2% patients had folds in Descemet's membrane.

The surgical results obtained in our study compare favorably with those mentioned in the literature for MSICS¹². A study from Mumbai, India showed temporal and superior temporal tunnels to induce less astigmatism compared with superior tunnels for MSICS¹³. Posterior capsular opacification occurred in 8% of patients, is consistent with other studies¹⁴.

According to WHO guidelines 85% of cataract surgeries should attain good visual outcome (presenting visual acuity PVA: 6/18 or better). Our study shows 83% similar results. The WHO recommends that poor visual outcomes should not be more than 5% after cataract surgery. In this study it is

worse than WHO guidelines but still better than other studies¹⁵. Another finding in current study is that among 7% of the patients having poor visual results, women had higher proportion than men (23 vs12) female, male ratio, and another 8% having irregular pupil, female/male ratio was (28vs12) is consistent with the findings of the Pakistan National Blindness and Visual Impairment Survey¹⁶. The excess rate of poor visual outcome among women explains that why “fears” of operation or its poor outcomes were present among women than men¹⁷. This gender difference needs to be more elaborated In future.

Uncorrected astigmatism can cause blurred images and glare. These effects create discomfort and dissatisfaction in otherwise uneventful cataract surgery¹⁸.

The burden of cataract blindness occurs in low and middle-income countries where access to eye care is not easy. In developing countries where human resources are a challenge, the quality of cataract surgery and up-to date information is the hallmark of ultimate outcome¹⁹. In Pakistan where earnings by patients are low, 70% of population live in rural areas, In our set up SICS with IOL is safe procedure²⁰.

REFERENCES

- Aruta A, Marengo M, Marinozzi S. History of cataract surgery. *Med Secoli*, 2009. 21(1):403- 428.
- Majka C, Carlson A. Ophthalmic Pearls: Cataract: When to Use Multifocal Intraocular Lenses. American Academy of Ophthalmology website. Available at <http://www.aao.org/publications/eyenet/200609/pearls.cfm>, Accessed May 9, 2016.
- Pascolini D, Mariotti SPM. Global estimates of visual impairment: 2010. *British Journal of Ophthalmology Online* First published December 1, 2011 as 10.1136/bjophthalmol-2011-3005395
- PB17 Session. Vision2020: the right to sight – the first five years, World Ophthalmology Congress, Sao Paulo, Brazil; 21 February 2006.
- Bourne R, Dineen B, Jadoon Z, et al. The Pakistan National Blindness and Visual Impairment Survey research design, eye examination methodology and results of pilot study. *Ophthalmic Epidemiol* 2005;12:321–33.
- Anjum KM, Qureshi MB, Khan MA, et al. Cataract blindness and visual outcome of cataract surgery in a tribal area in Pakistan. *Br J Ophthalmol* 2006;90:135–8.
- Federal Bureau of Statistics, Statistics Division, Government of Pakistan <http://statpak.gov.pk> (accessed 2 June 2006)
- Pakistan National Human Development Report 2003. http://hdr.undp.org/statistics/data/country_fact_sheets/cty_fs_PAK.html (accessed 1 August 2006)
- Kongsap P. Visual outcome of manual small-incision cataract surgery: comparison of modified Blumenthal and Ruit techniques. *Int J Ophthalmol*, 2011;4(1):62-5.
- Ruit S, Tabin G, Chang D, Bajracharya L, Kline DC, Richeimer W, Shrestha M, Paudyal G. A prospective randomized clinical trial of phacoemulsification vs manual sutureless small-incision extracapsular cataract surgery in Nepal. *Am J Ophthalmol*. 2007;143(1):32–38
- Gogate PM, Kulkarni SR, Krishnaiah S, et al., Safety and efficacy of phacoemulsification compared with manual small incision cataract surgery by a randomized controlled clinical trial: Six weeks results, *Ophthalmology*, 2005;112:869–74
- Oshika T, Nagahara K, Yaguchi S, et al., Three year prospective randomized evaluation of intraocular lens implantation through 3.2 and 5.5 mm incisions, *J Cataract Refract Surg*, 1998;24:509–14.
- Gokhale NS, Sawhney S, Reduction in astigmatism in manual MSICS through change in astigmatism site, *Indian J Ophthalmol*, 2005;53:201–3.
- Shamberg DA, Dana MR, Christen WG, Glynn RJ. A systemic overview of the incidence of posterior capsular opacification. *Ophthalmology*. 1998;105:1213–21
- Tabin G, Chen M, Espandar L. Cataract surgery for the developing world. *Current opinion in ophthalmology*. 2008;19(1):55–9. Epub 2007/12/20. doi: 10.1097/ICU.0b013e3282f154bd pmid:18090899
- Bourne R, Dineen B, Jadoon Z, Lee PS, Khan A, Johnson GJ, et al. Outcomes of cataract surgery in Pakistan: results from The Pakistan National Blindness and Visual Impairment Survey. *The British journal of ophthalmology*. 2007;91(4):420–6. Epub 2006/12/08. doi: 10.1136/bjo.2006.106724 pmid:17151060; Pub Med Central PMCID: PMC1994747.
- Ahmad K, Zwi AB, Tarantola DJ, Chaudhry TA. Self-Perceived Barriers to Eye Care in a Hard-to-Reach Population: The Karachi Marine Fishing Communities Eye and General Health Survey. *Investigative ophthalmology & visual science*. 2015;56(2):1023–32. doi: 10.1167/iops.14-16019 pmid:2556 4446.
- Reddy B, Raj A, Singh VP. Site of incision and corneal astigmatism in conventional SICS versus phacoemulsification. *Ann Ophthalmol (Skokie)* 2007;39:209-16.
- Ahmad K, Zwi AB, Tarantola DJ, Chaudhry TA. Self-Perceived Barriers to Eye Care in a Hard-to-Reach Population: The Karachi Marine Fishing Communities Eye and General Health Survey. *Investigative ophthalmology & visual science*. 2015;56(2):1023–32. doi: 10.1167/iops.14-16019 pmid:25564446
- Ahmad K, Zwi A, Daniel J, M Tarantola. Eye Care Service Use and Its Determinants in Marginalized Communities in Pakistan: The Karachi Marine Fishing Communities Eye and General Health Survey. *Ophthalmic epidemiology* 22(6):1-10 April 2015
- Riley, Malik, Grupcheva et al. The Auckland cataract study; Co Morbidity surgical techniques and clinical outcome in a public hospital services. *Br J. Ophthalmol* 2002;86; 185-190

Short running title: Small Incision Cataract Extraction