



## Efficacy of Small Incision Cataract Surgery in Patients with Systemic Co Morbidity– A Hospital Based Study

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### ABSTRACT

*Cataract is a leading cause of blindness worldwide. Uttarakhand is a state with poor access to medical facility. In resource limited setting SICS is an acceptable option for cataract treatment. Prospective study carried out at BD Pandey hospital, Pithoragarh, from September 2014 to August 2015, to assess Pre and post operative visual outcomes. A total of 1038 cataract patient underwent SICS, male were more (61%), and more right eye operated (58%). Nearly half (48%) patients were >60 years of age, hypermature cataract was present in 53% patients Diabetes was seen in 84 patients (8.09%), and hypertension in 115 patients (11.07%). Retained cortical matter was the commonest post operative complication (5%). Visual acuity improved in most of the patients post operatively*

**Conclusion:** SICS is cost effective technique with good outcome, even with systemic co-morbid conditions. It may be instrumental for remote hilly area where access to medical facility is sparse.

**KEYWORDS :** SICS, Small incision cataract surgery, complication, Uttarakhand, co-morbidity

### Introduction:

Cataract is most common cause of curable blindness in India. According to WHO, 47.8% of global blindness is due to cataract, and Recent global estimates of visual impairment from the World Health Organization (WHO), reveal that 47.8% of global blindness is due to cataract.<sup>1</sup>

In South Asia region which includes India, 51% of blindness is due to cataract. It is the principal cause of blindness in India accounting for 62.6%.<sup>2</sup>

An estimated 4 million people become blind because of cataract every year, which is added to a backlog of 10 million operable cataracts in India, whereas only 5 million cataract surgeries are performed annually in the country. [approximately 4 million people become blind every year, which is added to existing backlog of ten million people. Whereas 5 million surgery are done annually in India<sup>3</sup>

Uttarakhand, is a state of geographical and climatic diversities ranging of top snow peaked mountain ranges to the most fertile plain lands in India. . The cataract prevalence is expected to be high in this area because of in UV exposure in high altitude<sup>4</sup>.

.To eliminate preventable blindness in India, high volume, high quality, and low cost cataract surgeries are needed<sup>5</sup>.

In the last two decades, small incision cataract surgeries (SICS) have improved the quality of cataract service and reduced the cost.

Uttarakhand is a state of geographical and climatic diversities. Access to medical facility and poverty are hindrance in delivering eye care in remote places of Uttarakhand. Small incision cataract surgery (SICS) have improved the quality of cataract surgery and risk of late complication is less. Hence in resource limited setting SICS is an acceptable option, but post operative outcome of cataract surgery in remote places of Uttarakhand has not been studied in past.

### Aims

To assess the safety and efficacy of small incision surgery(SICS) in study patients during study period(September 2014-August 2015)

### Materials & Methods:

**Place of study:** BD Pandey District Hospital, Pithoragarh,

**Period of study:** September 2014 to August 2015

**Study design:** Prospective study.

**Study population:** Patients complaining diminution of vision were screened for presence of cataract. All patients which were selected were having chronic systemic co morbidity like diabetes, hypertension and other medical problems. Patients having cataract selected on the basis of following criteria as below

### INCLUSION CRITERIA:

All patients above 40 year of age

All types of senile cataract ( intumescent, mature, hypermature)

### EXCLUSION CRITERIA

Congenital, traumatic, and complicated cataract

### Study procedure:

Patient who complain of diminution of vision were analyzed and send for visual assessment and refraction. Patient's not improving with refraction were examined for lenticular changes and fundus. Those who give consent for surgery were selected for study. Complete eye examination (visual acuity by snellen's chart, slit lamp, fundus, IOP, biometry for IOL power calculation) done. Systemic examination for hypertension, diabetes and cardiovascular examination was done by physician. Follow up was done at day 1, 1 week and 6 week. At the end of 6 week best corrected visual acuity was done by snellen's chart.

### Surgical Steps:

Patients underwent small incision cataract surgery (SICS) with posterior chamber IOP implantation (PMMA).

1. Superior Rectus bridle suture taken.
2. Conjunctiva was dissected at limbus, hemostasis was achieved after cauterisation.
3. Straight scleral incision give about 1.5mm away from incision. The length of the incision was decided according to the grade

- of the cataract.
- 4. Scleral flap was made, further progressed to make corneoscleral pockets.
- 5. Corneal flap was made by entering about 0.5mm into the cornea.
- 6. Entry into anterior chamber (AC) was made through which viscoelastics was injected.
- 7. Side port entry was taken and continuous curvilinear capsulorhexis(CCC) was made through side port.
- 8. Capsulotomy was done if there is run away of CCC especially in hypermature cataract's.
- 9. Hydrodissection was done, avoided in hypermature cataracts.
- 10. AC was maintained with viscoelastics. Scleral incision was increased according to the grade of the nucleus.
- 11. Nucleus is tumbled into the AC in cart wheel fashion, expressed out with wire vectis after putting viscoelastic below & above the nucleus.
- 12. Cortical wash was thoroughly done with simcoe's bimanual irrigation & aspiration cannula.
- 13. Intraocular Lens according to individual power was inserted.
- 14. Viscoelastics was washed out.
- 15. Subconjunctival gentamycin & dexamethasone injection was given.
- 16. Topical antibiotic & steroidal drops, cycloplegics were instilled.
- 17. Pad & Bandage was done.

Post operative patients were advised oral antibiotics and analgesic for 5 days and topical antibiotic and steroid drop was advised for six weeks. Medical co morbidity was taken care of treating physician. Patient followed for 6 week, visual acuity and refraction done at 6 week). In SICS intraoperative, as well as post operative visual outcomes were used as main measures to report the safety and efficacy of surgery.

**Results:**

1038 patients were taken for surgery who were having different medical co morbidity (diabetes and hypertension). Out of 1038, 84(8.09%) patients were hypertensive and 115(11.07%) patients were diabetic.

**Demographic characteristics of Patient:**

Out of 1038 patients 633(61%) patients were male and 405(39%) were female. In age wise distribution most of them were aged more than 60 years, n-498(48%). Right eye was more involved in study patients n-602(58%),most of the patients had hypermature type of senile cataract n-551(53%).(table:1)

**Table 1: showing demographic characteristics**

PATIENT CHARACTERISTICS		No. Of Patient	Percentage
sex	Male	633	61%
	Female	405	39%
Eye involved	Right	602	58%
	Left	436	42%
Age of patient	< 40 YEARS	145	14%
	40-60 YEARS	395	38%
	>60 YEARS	498	48%
Type of cataract	INTUMUSCENT	228	22%
	MATURE	259	25%
	HYPERMATURE	551	53%

**Month wise distribution of cases**

Total 1038 cataract surgeries were done from September 2014 to August 2015, with maximum number of surgery done in month of March (14.6%) and least during September (4.4%). (Table: 2)

**Table 2: DISTIBUTION OF SURGERY IN DIFFERENT MONTH**

MONTH	NO. OF CATARACT SURGERIES
SEPTEMBER 2014	46
OCTOBER 2014	49

NOVEMBER 2014	107
DECEMBER 2014	87
JANUARARY 2015	59
FEBURARY 2015	67
MARCH 2015	152
APRIL 2015	100
MAY 2015	91
JUNE 2015	105
JULY 2015	85
AUGUST 2015	90
TOTAL	1038

Post Op Complications: Most common complication of SICS was retained cortical matter it was seen in 52 (5%) patients cases, followed by corneal edema, n-21(2%) which resolved after 3-4 days of topical medication. (Table: 3)

**Table 3:Postoperative complication**

	No. Of Patient	Percentage
CORNEAL EDEMA	21	2%
IRIDODIALYSIS	4	0.4%
LENS DISLOCATION	15	1.4%
IOL DROP	0	0
ENDOPHTHALMITIS	0	0
RETAINED CORTICAL MATTER	52	5%
MISCELLANEOUS	67	6.4%

**Visual parameters:**

Preoperatively on assessment of visual acuity,643 patients (62%) followed by 353 patients(34%)were having acuity <6/60, in repeat assessment postoperatively at 6TH week , most of patients i.e 834,(80.4%) were having visual acuity(BCVA by snellens)of 6/9-6/18 115(11.1 %) patient did not improved postoperatively, their visual acuity were <6/60 even after operation. (Table: 4)

**Table: 4 Pre and postoperative visual parameter**

REFR-TIACON	PARAMETERS	PRE OP	POST OP (at 6 week)
VISUAL ACUITY	6/9-6/18	42(4%)	834(80.4%)
	6/18-6/60	353(34%)	89(8.5%)
	<6/60	643(62%)	115(11.1%)
ASTIGM-ATISM	<1.00D	73(7%)	42(4%)
	1-3 D	924(89%)	934(90%)
	>3D	41(4%)	62(6%)

**Discussion:**

This is due to the harvesting season in the valley during September-October.

Though Phacoemulsification is the preferred technique in the developed world and tertiary centres of developing countries<sup>6,7,8</sup> , small incision cataract surgery has been proved equally effective in many studies<sup>8,9</sup>. We have analyzed the efficacy of SICS in hilly terrain. 10 several studies have been done across world assessing outcome of cataract surgery, but few studies were done in state of Uttarakhand.

In present study 61 % of patients were male & 39% were female. Male preponderance was also observed in many other studies<sup>10,11,12</sup>.

This may be because they are treated earlier and are more exposed to UV ray, as they remain mostly outdoor. Right eye surgery was done in 602 (58%) patients as compared to 436 (42%) patients in Left eye. Maximum number of patient was in age group > 60 years (498). This distribution of age was similar to many studies performed across the

world, especially in developed countries<sup>10,11,12</sup> In our study there is no major variations in numbers of surgery during summer and winters. Similar pattern seen in study from Nepal<sup>13</sup>.

Commonest complication SICS was retained cortical matter, which depends upon skill of operating surgeon. Corneal edema was reported in 21 cases in our study, that may be because, most of the cataract were hard and hypermature.

In our study pre operative visual acuity in most of patient was very poor, with 643(63%) having visual acuity <6/60. Final visual outcome at 6th post operative week was satisfactory with BCVA 6/18 or better was reported in 85% cases which is comparable with Rajiv B. Khandekar et al study<sup>14</sup>.

There is slight increase in astigmatism by 2% in 3(D) diopter which is also suggested by Parikshit Gogate et al study. 15. 1038 patients were included with different medical co morbidities like diabetes and hypertension. In 11.1% cases vision remained < 6/60, possible explanation of this number is that different systemic co-morbidities with ocular manifestation (diabetic retinopathy, hypertensive retinopathy, ARMD, optic atrophy).

All patients with diabetes and hypertension underwent surgery only after control of these disease. So there must be a good co-ordination between an ophthalmologist and physician to manage these co-morbidities.

An excellent self-sealing incision is vital for wound architecture on which the safety and lowered astigmatism potential rests. Result shows a good visual outcome at low cost and these type of procedure should be recommended in resource poor setting, especially hilly terrain where availability of medical facility is poor.

### Conclusion:

India is a resource poor country with large number of blind people with cataract. SICS have shown good postoperative results, less complication and is cost effective also which may be instrumental for remote hilly area where access to medical facility is poor. SICS proves to be safe and efficacious alternative for majority of patients, even with systemic co-morbid conditions.

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