



COMPARATIVE STUDY ON SICS VS PHACO IN EYES WITH CATARACT AND PSEUDOEXFOLIATION

Dr. Amudalapalli Subba Ram

Civil Surgeon, Department of Ophthalmology, Government Hospital, Eluru, Eluru, West Godavari District, Andhra Pradesh 534002, India.

Dr. Amudalapalli Anila Sarvani*

Consultant, A A Hospital, Bendapudi Vari Street, R. R. Peta, Eluru, West Godavari District, Andhra Pradesh 534002, India. *Corresponding Author

ABSTRACT

To compare the intra-operative complications and visual outcome in patients with pseudo-exfoliation undergoing SICS and PHACO at a secondary eye care centre in a rural set up.

Methods: A prospective and conveniently sampled observational study was conducted from March 2017 – Feb 2018 in ophthalmology department at a District General Hospital in rural part of South India. This study included a sample size of 200 patients who were diagnosed with cataract and PXF and who were willing to undergo cataract surgery (100 - SICS/100 – PHACO). All the patients underwent a complete ophthalmologic evaluation, including slit-lamp examination, tonometry, gonioscopy and fundus examination before the surgery. As per patient willingness and clinical picture Cataract surgeries (SICS and PHACO) were performed by an experienced single senior surgeon. Intraoperative and postoperative events were recorded. Following which management of these cases, based on facility available was done.

Results: On comparison between PHACO and SICS groups no statistically significant differences were observed with respect to intra-operative complications {n=23 in PHACO versus n=34 in SICS, p=0.35}. sphincterotomy was required in a significantly higher number of SICS cases (p=0.03). No statistically significant differences were observed in terms of post-operative complications (overall n=8 in PHACO versus n=15 in SICS, p=0.31).

Conclusion: In this study we found that there is no statistical significance in complications and visual outcome between PHACO and SICS. With careful and complete pre-operative assessment, intra-operative modifications and surgical expertise, both PHACO and SICS are apparently safe procedures in eyes with pseudoexfoliation.

KEYWORDS : Phaco, SICS, Pseudoexfoliation, cataract surgery, complications in cataract.

INTRODUCTION:

Pseudoexfoliation (PXF) syndrome is an age-related disorder characterized by the production and progressive accumulation of fibrillar-granular extracellular material in many ocular tissues. Renewed interest in this long known entity results from better awareness of the spectrum of intra-ocular risks not only for open angle glaucoma but also in conjunction with/or intra-ocular surgery, especially cataract extraction. PXF is characterized clinically by whitish flaky deposits, mostly on the pupillary margin and the anterior lens capsule. It is also deposited on the corneal endothelium, trabecular meshwork, ciliary body, ciliary zonules and even the anterior vitreous¹.

Cataract surgery on eyes with PXF has difficulties related to altered structures due to the deposition of white fibrillary material and hence susceptible for increased risk of surgical complications. These include intra-operative problems such as corneal endotheliopathy, small pupil, zonular weakness, posterior capsule dehiscence, vitreous loss, etc. In addition, post-operative spectrum of complications includes post-operative Intra-ocular Pressure (IOP) spike, corneal oedema, posterior capsular opacification, anterior capsular phimosis, macular oedema, etc.¹

In developing countries like India, both Phacoemulsification (PHACO) and manual Small Incision Cataract Surgery (SICS) are among the most common procedures performed for cataract extraction. In the setting of PXF, both procedures are fraught with risks. Meticulous pre-operative planning and modification of intra-operative techniques can help reduce the incidence of complications. However, no single surgical technique has been conclusively proven to be safe for cataract extraction in presence of PXF. Since this is a secondary eye care centre in a government set up in semi – urban area with main concentration on camps we would be dealing with many cases of cataract associated with PXF. Hence, we decided to conduct a comparative study analysing the visual outcome of PHACO versus SICS in the combined setting of cataract and PXF.

MATERIALS AND METHODS:

A prospective, observational study was conducted in the ophthalmology department of a secondary care setup in a district government hospital in Andhra Pradesh over a period of one year from March 2017 to February 2018. Ethical approval was obtained from the Institutional Review Board of the hospital. Patients scheduled for cataract surgery from OPD and eye camps and who were diagnosed with PXF was included. Informed consent was obtained from all the subjects.

INCLUSION CRITERIA:

Pts belonging to either sex and diagnosed to have cataract with PXF on the basis of slit lamp examination, before and after pupillary dilatation.

EXCLUSION CRITERIA:

1. Patients <50 yrs of age, trauma and eye diseases other than PXF or early mild cataract.
2. Patients with uncontrolled Diabetes Mellitus or severe systemic disorders
3. Patients not willing to sign the consent form.

All pts were randomly divided into two groups. Pts who underwent SICS were included in Group 1 and PHACO patients in Group 2. All underwent a complete ocular examination. Slit lamp examination for morphological alterations of the cornea, PXF material in the pupillary margin, anterior chamber depth and pigment dispersion in the anterior chamber, pupillary reaction, iridodonesis, measurement of pupil size before and after dilatation of pupil. We examined the IOP using Goldmann applanation tonometer, Gonioscopy with Goldmann two mirror lens in all patients with PXF. Cataract grading was done based on the Lens Opacity Classification System (LOCS-III)(2).

Pre-operative preparation: All pts were given topical antibiotics on the preoperative day. On the day of surgery pupil of the operating eye was dilated adequately using instillation of 0.8% tropicamide and 5% phenylephrine eye drops and in patients where IOP was between 25 -30 mm Hg Tab Diamox 250mg 2 tablets stat dose was given in the block room before peribulbar anaesthesia. Under aseptic precautions Cataract Surgery (PHACO/SICS) was performed by a single senior ophthalmologist.

Intra-operative procedures: Surgery was performed by single surgeon well-versed with both PHACO and SICS. Bimanual PHACO was done with temporal clear corneal incision and SICS via a superior 5.5 mm incision. In-the-bag implantation of Posterior Chamber Intra-Ocular Lens (PCIOL) was attempted in all cases. Hydrophobic acrylic foldable one-piece IOLs were used in PHACO group and rigid Polymethyl Methacrylate (PMMA) lenses in SICS group. Intra operative complications were managed appropriately but in patients who had to be left aphakic during primary cataract surgery underwent secondary implantation at a later date.

Post-operative management: After surgical wound cleaning Uncorrected Visual Acuity (UCVA) and slit lamp biomicroscopy was

done. All uncomplicated cases were then discharged with Topical antibiotic-steroid combination drops (Moxifloxacin and prednisolone) in tapering doses.

RESULTS:

The study sample consisted of 126 females (252 eyes) and 74 males (148 eyes). PXF was clinically evident bilaterally in 79% cases. Pupillary margin was the most common site of deposition of PXF material in 84 cases followed by anterior lens capsule in 75 cases. 66% had a poorly dilating pupil (diameter <6 mm after dilation).

Primary implantation was possible in 194 cases. 6 had to be left aphakic during primary surgery due to intra-operative complications. 4 of them belonged to SICS and 2 of them in PHACO group. The intra-operative complication rates have been demonstrated in table 3. Although the post op complication rate was higher in SICS group in terms of numbers, there was no statistically significant difference among the two. Comparison of post-op UCVA on POD 1, POD 15, POD 40 is illustrated in Table 4. On POD- 40, 84% of the patients achieved an UCVA of 6/9 or better.

DISCUSSION:

Based on literature review, we have reiterated that patients with pseudoexfoliation are at increased risk for development of complications. But we also found that there is no statistical significance in intraoperative complications between SICS and PHACO in patients with PXF. There are a very few studies like ours which have compared the complications and visual outcome during SICS and PHACO among patients with cataract and pseudoexfoliation.

Table 1: Distribution of patients in terms of Age and Sex

	SICS	PHACO	Total
AGE IN YEARS			
40-49	17	17	34
50-59	38	38	76
60-69	30	30	60
70-79	11	11	22
>80	4	4	4
SEX			
Males	37	37	74
Females	63	63	126

Table 2: Distribution of PXF Material, AC Depth, Dilation and IOP

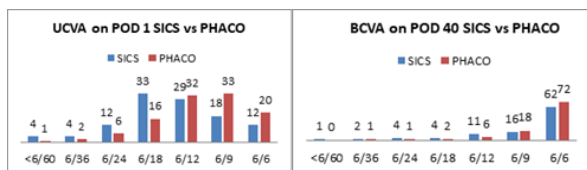
	SICS	PHACO	Percentage (%)
PXF LOCATION			
Endothelium	11	14	12.5
Pupil margin	44	40	42
Iris	27	28	27.5
Lens	36	39	37.5
AC Angle	25	28	26.5
DILATION			
<6mm	64	68	66
>6mm	26	22	24
AC DEPTH			
Grade 1	3	1	2
2	16	14	15
3	63	69	66
4	18	16	17
IOP			
<14 mmHg	62	64	63
14 - 21	27	24	25.5
21 - 30	11	12	11.5

Table 3: Intra-operative and Post-operative complications (Fischer Test)

	SICS	PHACO	p-value	Statistical significance
INTRA - OP				
Difficulty in rhexis	19	12	0.17	none
Zonular dialysis	5	3	0.4	none
Iridodialysis	4	2	0.7	none
Floppy Iris	6	1	1	none
PCR	3	2	0.52	none

Nucleus drop	0	2	0.21	none
MODIFICATION				
<i>Sphincterotomy</i>	12	4	0.03	YES
CTR placement	4	3	0.1	none
POST - OP				
Corneal oedema	5	3	0.4	none
Striate Keratopathy	8	2	0.8	none
Inflammation	2	3	0.5	none

Table 4: UCVA on POD 1 and BCVA on POD 40



The study sample consisted of 74 males and 126 females. Almost 66% had a poorly dilating pupil (<6 mm after dilation). Table 1 and 2 describes the demographic characteristics and ocular characteristics in the study. Primary PCIOL implantation was possible in 195 cases. 5 patients had to be left aphakic in primary sitting due to intra-operative complications. Two of these belonged to the PHACO and three to SICS group. Secondary implantation was done in all these five cases at a later date.

Table 3 describes the intra operative complications, modification done and post operative picture in the study sample. Posterior capsular tear was 3% in SICS and 2% in PHACO, while other studies have reported rates varying from 0% to 11% in SICS (3,4,6) and 0.3% to 7.7% (5,7,8,9,10) in PHACO. In this study, the PCR rates were comparable to studies [3,4,5,6,7,8,9,10] conducted worldwide. Though the incidence of PCR was lower in the PHACO group, statistically significant difference was not found between them. 5% patients in SICS group and 3% patients in the Phaco group had zonular dialysis. It ranged from 4% to 15.6%³⁴ in studies evaluating SICS and from 3% - 10% with phacoemulsification^{5,9}. Intra-operative technique modifications employed were that in a significantly higher number of SICS cases a controlled sphincterotomy had to be done compared to the PHACO group. However, this apparently significant difference in the rates of sphincterotomy may be because of the basic difference in the process of nucleus management in PHACO and SICS.

Table 4 describes the comparison of post op visual acuity in both groups. On POD 1 the UCVA was widely ranging from 6/60 to 6/6. But by POD 40 almost 84% had BCVA >6/9. Sufi AR et al., noted a visual acuity of equal to or better than 6/9 in 72% of their PEX group patients⁸.

CONCLUSION:

Based on the results of the study we conclude that even though the numbers show higher rate of complications in SICS group than PHACO group there was no statistical significance among the two. Inadequate mydriasis is one of the major preoperative risk factor and Inherent zonular weakness can lead to dialysis intraoperatively, which predisposes to variety of complications. This proves that both SICS and PHACO are apparently safe operative procedures in PXF. Use of CTR and controlled sphincterotomy need to be contemplated and tailored according to merit of each individual case.

REFERENCES:

1. Bušić M, Kaštelan S. Pseudoexfoliation syndrome and cataract surgery by Phacoemulsification. CollAntropol. 2005;29(1):163-66. Available from: <http://hrcak.srce.hr/file/43945>. Last accessed November 2014.
2. Chylack LT, Wolfe JK, Singer DM, Leske MC, Bullimore MA, Bailey IL, et al. The lens opacities classification system III. The longitudinal study of cataract study group. Arch Ophthalmol. 1993;111:831-834
3. Pranathi K, Magdum RM, Maheshgauri R, Patel K, Patra S. A study of complications during cataract surgery in patients with pseudoexfoliation syndrome. J Clin Ophthalmol Res. 2014;2:7-11.
4. Lumme P, Lattikainen L. Exfoliation syndrome and cataract extraction. Am J Ophthalmol. 1993;116:51-5.
5. Dossó AA, Bonvin ER, Leuenberger PM. Exfoliation syndrome and phacoemulsification. J Cataract Refract Surg. 1997;23:122-25.
6. Rai G, Shingal P, Gupta V, Zarrin S. A comparative study of outcome of small incision cataract surgery in eyes with and without pseudoexfoliation syndrome. International Journal of Scientific study. 2014;2:78-81.
7. Shastri L, Vasavada A. Phacoemulsification in Indian eyes with pseudoexfoliation syndrome. J Cataract Refract Surg. 2001;27:1629-37.
8. Sufi AR, Singh T, Mufti AA, Rather MH. Outcome of phacoemulsification in patients with and without pseudoexfoliation syndrome in Kashmir. BMC Ophthalmol. 2012;12:13.
9. Shingleton BJ, Heltzer J, O'Donoghue MW. Outcomes of phacoemulsification in patients with and without pseudoexfoliation syndrome. J Cataract Refract Surg.

2003;29:1080-86

10. Mohan P, Mamatha SR, Krishnan T. Changing trends in cataract surgical techniques – in PXF (Pseudo-Exfoliation) Cataracts. Proceedings of the All India Ophthalmic Conference. 2010;148-50.