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Changing Trends in Cataract Surgical Techniques - In PXF (Pseudo-Exfoliation) Cataracts

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Pseudoexfoliation (PXF) cataract forms a part of pseudoexfoliation syndrome (PXS). PXS is characterized by distribution of fibrillar material through out the anterior segment. The dust like material is best seen on the anterior surface of the crystalline lens. PXF material is also seen on schwalbe's line, endothelium and trabecular meshwork. PXS often associated with cataract and glaucoma. Cataract surgery in these cases are challenging due to rigid & poorly dilating pupil, weak zonules, increase tendency for subluxation, peripheral irido capsular adhesions, PCR/ Zonular dialysis and postoperative FM formation.

Various techniques of cataract extraction like extra capsular extraction, SICS and phaco can be done in cases of PXF. Today a lot of emphasis is laid on early visual rehabilitation. In view of this phaco has become very popular. Phaco is a machine dependent technique and it has got a longer learning curve and expensive. SICS has become a talk of the day and the surgery of choice in developing country as it has shorter learning curve and cost effective when compared to phaco. But the only concern to the surgeons is

to know how safe this surgery is in PXF cases, which is associated with increased incidence of intra operative and postoperative complications in addition to compromised endothelium. For quite sometime Phacoemulsification has been applied to tackle all types of cataract including PXF cataract. But fear of challenges (complications) of these cataracts always will be there in the mind of surgeons. After performing phacoemulsification through 2.8mm incision, surgeons are looking for the possibility of phaco through much smaller incisions Microphaco is another technique where surgery is done through smaller incisions than routine co axial phaco (under 1.5 mm). Surgeons have tried microphaco in these cases as well. We took up this study to know the outcome of SICS, PHACO and Microphaco in PXF cases. All the surgeries were done by single surgeon.

Materials and Methods

This study included 230 patients with PXF cataract who required Cataract surgery. They were divided into 3 groups. Group A -100 patients who underwent SICS with PCIOL implantation by sandwich method. Group B-100

patients underwent Phaco with PCIOL implantation. Group-C: underwent BMP (bimanual phaco) with PCIOL implantation. All patients underwent a thorough preoperative evaluation including visual acuity, slit lamp examination with special emphasis on phacodonesis, pupillary dilation, IOP and optic disc evaluation when the fundus was visible. Cases with subluxation were excluded.

Procedure:

Group-A- 6 mm frown shaped standard superior scleral tunnel was constructed using crescent knife about 2-2.5 mm away from the limbus, anterior chamber entered using 3.2 mm keratome. Under liberal viscoelastics, either a can opener or Continuous Curvilinear Capsulorhexis (CCC) was done. After wound extension the nucleus was prolapsed into anterior chamber either by bimanual technique usinginsky and cyclodialysis spatula or by hydroprolapse where CCC was done. Nucleus was extracted by sandwich technique under viscoelastic cover. Group B underwent phacoemulsification through scleral tunnel using stop and chop technique. Group C underwent BMP through temporal clear corneal incisions at 3 and 9 0 clock hours with irrigating chopper as a second instrument and using conventional phaco machine. Group A underwent rigid PMMA PCIOL implantation and Group B & C underwent foldable IOL implantation.

Results

Out of 230 cases, majority of patients were in the age group of 60-70 years with male prepondence .There was no predilection for right or left eye with respect to incidence of cataract. Bilateral PXF cases were also seen. Average IOP recorded was 17 mm of Hg with applanation with the range between 12-23 mm of Hg. Pupillary diameter less than 4 mm was seen in 59 cases. Majority of cases had Grade 2-3+ nucleus. We had cases with mature cataracts and Grade 4+ nucleus also in all the groups.

Intra operatively Posterior capsular rent was seen in 2 cases each in group A and Group B and one case in group C. In all these cases automated vitrectomy done and PCIOL was implanted. Zonular dialysis was seen in 4 cases and 3 cases in Group A and Group B respectively. One case in Group C had Zonular dialysis. All these

patients underwent PCIOL implantation except for 1 case in Group A which underwent secondary sclera fixation PC IOL .Transient corneal edema was seen in immediate post operative period which resolved in 2-3 days in most of these cases. Transient Corneal edema was seen in 33 cases. It was more in Group A. Incidentally this was more associated harder Cataracts (NS>3+). Fibrin membrane was seen in 12 cases. Of which 7 cases belonged to SICS group and 4 cases to Phaco group and one case in Microphaco .All these patients responded well with increased frequency of topical steroids and cycloplegics and 2 cases required short course of oral steroids. Anterior Chamber reaction was less in Phaco and Microphaco. One week post operative visual acuity (BCVA)of 6/6-6/12 was seen in 71%,88% and 90% in Group A, Group B and C respectively .

Intraoperative problems and post-operative complications:

	Gr-A	Gr-B	Gr-C
Pupillary diameter <4 mm	32	3	4
PCR	2	2	1
Zonular dialysis	4	3	1
Transient corneal edema	19	0	4
Fibrin membrane	7	4	1
Sterile hypopyon –	1	—	—

Discussion

Cataract surgery in PXF cases is challenging because of the higher incidence of complications due to rigid and poorly dilating pupil, weak zonules, increased tendency for subluxation, PCR, zonular dialysis and post operative fibrin membrane formation.. Poor mydriasis seen in PXF cases adds more problems. 59 cases in our study had pupillary diameter of < 4 mm. As these cases have a big nucleus, adequate capsulotomy or CCC was done. In cases where CCC was done, hydroprolapse in (SICS) had to be done carefully with minimal pressure and decompression, since the zonules in PXF cases were weak. Cataract in PXF cases can be extracted by various techniques like ECCE, SICS, phaco and Microphaco. SICS has become a talk of the day and the surgery of choice in many developing country as it is cost effective. But the only concern to the surgeons is safety of this surgery is PXF with associated compromised endothelium. In order to decrease

the trauma to endothelium, one has to use viscoelastics liberally and make a larger section whenever nucleus is big/hard and use appropriate extraction techniques. Surgeon should not hesitate in doing multiple sphincterotomies, superior SI or even conversion to ECCE if necessary. Though SICS is a relative contraindication in PXF cases; it still can be a safe method in expert hands.

Phacoemulsification is effective method in tackling to PXF cataracts. Our study showed good results can be obtained by Phaco. It's better to use chop technique and reduce the flow rates as there is weak zonular complex. CTR can be used depending on extent of integrity of capsule zonular complex and also it gives better centration in cases with zonular dialysis. Thorough preoperative evaluation, proper case selection, meticulous capsulorhexis liberal use of viscoelastics is mandatory to have good outcome. It's better to avoid subluxated lens and very hard cataract. Never hesitate to convert in case there is difficulty to proceed in Phaco.

Many surgeons globally are performing the surgery through incision smaller than 1.5 mm, which is called micro phaco. In this procedure, the irrigation is separated from the aspiration. The main advantage of microphaco is early visual rehabilitation. Common problems with bimanual phaco is surge and wound burn. The issue of thermal burns has been solved by the

introduction of higher version of phaco units and software, which is quite expensive. Our study showed that pseudoexfoliation cataracts can also be tackled by Microphaco using conventional Phacomachine. In PXF cataract there is additional difficulty due to weak capsulozonular support. The incidence of phaco burn can be reduced by keeping the wound slightly bigger than phaco needle and by avoiding snugly fitting wound, assistant dropping BSS on the wound during phaco procedure, using pulse mode, reducing the power and reducing the pace of surgery by foot pedal control. Power and flow rate has to be tailored depending upon integrity of capsulozonular support. It's better to do phaco with low parameters in these cataracts to avoid stress on zonules

Cataract surgery in PXF cataracts though challenging due to weak zonules, poor mydriasis and compromised endothelium, good results can be obtained using any of these techniques. To day we have a wider options like SICS, Phaco, Microphaco to tackle these cataracts without compromising outcome. SICS is a cost effective procedure and non machine dependent. ECCE has a minimal role to play to tackle these cataracts as outcomes cannot match new small incision techniques (phaco and non phaco). Meticulous planning and liberal use of viscoelastics is mandatory irrespective of the technique used to have good results in tackling PXF Cataracts.