



## PHACOEMULSIFICATION CATARACT SURGERY IN EYES WITH PSEUDOEXFOLIATION: RESULTS FROM A MILITARY HOSPITAL IN WESTERN INDIA

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### ABSTRACT

**OBJECTIVE:** The aim of this study was to evaluate the intraoperative and postoperative complications and visual outcomes of phacoemulsification cataract surgery in patients with pseudoexfoliation (PEX).

**MATERIALS AND METHODS:** 27 eyes with cataract and pseudoexfoliation that underwent phacoemulsification and intraocular lens (IOL) implantation were included in the study. A detailed preoperative assessment including visual acuity, slit lamp examination, presence of pseudoexfoliative material, intraocular pressure measurement, keratometry and biometry was done for all the patients. Intraoperative complications, use of adjunctive pupil and zonule support devices if any, postoperative day 1 intraocular pressure (IOP), prevalence of post operative corneal decompensation, anterior chamber inflammation and visual outcomes one month after surgeries were analyzed.

**RESULTS:** There were 13 males (48.1%) and 14 (51.8%) females among total of 27 patients with PEX and cataract. The mean age of the study group was 67.61 years (range 58-87 years). Mean pupillary diameter after maximal mydriasis was 6.14 mm (range 5-8 mm). Adjunctive pupillary or capsular support devices were not used in any case. At the end of 1 month, 24 eyes (88.8%) achieved a best corrected visual acuity (BCVA) of 6/9 to 6/6. Three eyes (11.1%) had a BCVA of 6/12. There was no case of vitreous loss, corneal decompensation and persistent intraocular pressure elevation in this study.

**CONCLUSION:** Phacoemulsification is safe in eyes with cataract and pseudoexfoliation with excellent postoperative visual outcomes. Awareness about potential complications of cataract procedures in patients with PEX is important to prevent intraoperative complications.

**KEYWORDS :** Pseudoexfoliation; zonular weakness; poor pupil dilation

### INTRODUCTION:

Pseudoexfoliation (PEX) syndrome is a common systemic age-related disease characterized by the production and deposition of abnormal fibrillar extracellular material in many ocular and systemic tissues [1]. It has been linked to the lysyl oxidase-like-one (LOXL1) gene [2]. Studies have shown that cataracts occur with increased frequency in eyes with PEX [3-4]. It is also the most common cause for secondary open-angle glaucoma worldwide [5]. Glaucoma with PEX responds poorly to medical therapy as compared to primary open angle glaucoma.

Literature has shown that eyes presenting with PEX are at a higher risk of developing complications during, and even after the cataract surgery. Therefore, its identification in patients undergoing cataract surgery is important in preventing complications. Pseudoexfoliation syndrome is a risk factor in cataract surgery because of the reduced pupillary dilatation and increased weakness of zonular apparatus leading to intraoperative or postoperative lens dislocation, vitreous loss, postoperative intraocular pressure (IOP) spikes potentiating glaucomatous damage, capsular phimosis, prolonged inflammation, and postoperative corneal decompensation [6].

Recent studies have observed that the risk of complications in eyes with pseudoexfoliation undergoing cataract surgery have shown a lower rate compared with earlier studies that showed up to a 10-fold increase [7-8]. There are very few studies on the efficacy and safety of phacoemulsification cataract surgery in eyes with pseudoexfoliation in Indian scenario [12]. The aim of this study was to evaluate the Intraoperative and postoperative complications and visual outcomes of cataract surgery with phacoemulsification in patients with pseudoexfoliation (PEX).

### MATERIALS AND METHODS:

The study was approved by institutional ethics committee and all aspects of the Declaration of Helsinki were observed. 27 eyes with pseudoexfoliation that underwent phacoemulsification cataract surgery and IOL implantation between Sep 2016 and Dec 2017 were enrolled in the study.

A detailed preoperative assessment was done and age, gender, visual acuity, slit lamp examination, size of pupillary dilatation, presence of pseudoexfoliative material, grade of cataract, fundus

findings, intraocular pressure measurement were noted for each patient. Intraocular lens power was calculated by keratometry and A-scan biometry.

Inclusion criteria included visually significant senile cataract and presence of fibrillar deposits on the pupillary margin, anterior lens capsule or both. Exclusion criteria were patients with a history of previous ocular surgeries, ocular trauma, phacodonesis or lens subluxation, uveitis, glaucoma or corneal pathology.

### Surgical technique

All procedures were done by either one of the two surgeons (RG, BVR) randomly assigned for each case using one of the two advanced phacomachines available at the centre. Cataract surgery was done with phacoemulsification through a 2.8 mm superotemporal clear corneal incision under peribulbar anaesthesia (a mixture of lignocaine 1%, bupivacaine 0.75%, and hyaluronidase). Anterior capsule was stained with Trypan blue dye 0.06% in all the cases. High-viscosity sodium hyaluronate (1.4%) was used in all the cases to mechanically stretch the pupil and a capsulorhexis of 5-6 mm was made with 26 gauge cystitome needle. Stop and chop technique was used during phacoemulsification for nucleus consumption. Pupil stretching devices or manoeuvres were not required in any case. A hydrophilic or hydrophobic acrylic single piece intraocular lens (IOL) was implanted in the bag. Intraoperative complications if any were recorded. The standard post operative treatment was with topical steroid antibiotic eye drops tapered over 04 weeks.

Examinations were done day 1, one week and at the end of 1 month postoperatively. At every visit, Uncorrected Visual Acuity (UCVA) and Best Correct Visual Acuity (BCVA) were recorded using a Snellen's chart along with slit lamp biomicroscopy, intraocular pressure (IOP) measurement (with Non contact tonometer) and fundus evaluation.

### RESULTS

A total of 27 eyes with cataract and pseudoexfoliation were included in the study. The mean age of the 13 males (48.1%) and 14 females (51.8%) was 67.61 years (range 58-87 years). Mean axial length was 23.25 mm (range 21.72 -26.80 mm) and intraocular lens power ranged from 12D - 26.5 D. Preoperatively 05 eyes (18.5%) had BCVA

of 6/12 or better, 10 eyes between 6/36-6/18 (37%) and 12 eyes (44.4%) had BCVA of 6/60 or less. Concerning grades of cataract, 03 eyes (11%) had grade I nuclear cataract, 08 (29.6%) eyes grade II nuclear cataract, 14 eyes (51.8%) mixed type (nuclear, posterior subcapsular, cortical), 01 eye (3.7%) grade III nuclear cataract and 01 eye (3.7%) had white mature cataract. Mean preoperative IOP was 14.16 mm of Hg (range 10-19 mm of Hg). Mean pupil diameter after maximal mydriasis was 6.14 mm (range 5-8 mm). Zonular dehiscence, capsular rupture, vitreous loss or nucleus drop was not observed in any case.

Transient corneal edema was the most common post operative complication. Eleven eyes (40.7%) had central corneal edema on the first postoperative day. Of these, eight eyes (72.7%) had mild to moderate central stromal edema and three eyes (27.2%) had diffuse stromal edema. Epithelial and stromal edema resolved by 7 days in all the cases. Eight eyes (29.6%) had intra ocular pressure (IOP) greater than 22.0 mm Hg on the first post operative day and required topical timolol 0.5% eye drops. Postoperatively at the end of 1 month, 24 eyes (88.8%) achieved a best corrected visual acuity (BCVA) of 6/6 to 6/9. Three eyes (11.1%) had a BCVA of 6/12. There were two cases (7.4%) of severe iritis on first post operative day which resolved by 1 week postoperatively. There was no case of corneal decompensation, persistent IOP elevation or endophthalmitis in this study.

## DISCUSSION

Pseudoexfoliation is believed to cause alterations in the iris vasculature and blood-aqueous barrier and could thus affect composition of aqueous. This could affect lens metabolism and result in earlier cataract formation. [9] Various studies have reported on the prevalence of type of cataracts in PEX eyes and overall cataracts tend to be harder in PEX eyes. In our study mixed type was the most common type of cataract similar to the results observed by Dosso et al [10]. Studies have reported significant prevalence of Phacodonesis and zonulolysis in eyes with PEX [11-12]. It is thought to be due to proteolytic disintegration of zonules by the PEX material [13]. However no patient in the study group had phacodonesis or zonulolysis. This may be due to dark irides in Indian eyes and indicate the possibility of less severe damage in the eyes with darker irides. Moreno et al also noticed iridophacodonesis to be more common in light coloured irides than those with dark irides [14].

Poor Pupillary dilatation is common in PEX eyes and can be risk factor for Intraoperative and postoperative complications [15]. It has been found that presence of PEX material causes iris stromal atrophy and deposits within the iris vessels. This can cause mechanical obstruction and restriction of pupillary movements [16]. 21 eyes [77.7%] in our study had pupillary diameter of 6.0 mm or more and continuous curvilinear capsulorhexis could be performed easily in all these cases. viscomydrisis with high viscosity viscoelastic (sodium hyaluronate 1.4%) was done in remaining cases to achieve adequate mydriasis for capsulorhexis. Adjunctive pupillary or capsular support devices were not used in any case.

Many studies report an increased incidence of Intraoperative and post operative complications rates in eyes with PEX undergoing cataract surgery [17]. These complications include zonular dialysis, vitreous loss, persistent corneal edema, prolonged inflammatory reaction and lens decentration. In our study, zonular dehiscence, capsular rupture, vitreous loss or nucleus drop was not observed in any case. This may be due to the surgical experience of the authors and lack of phacodonesis and zonulolysis in the study group. Transient corneal edema was the most common post operative complication. Epithelial and stromal edema resolved by 7 days in all the cases. Eight eyes (29.6%) had intra ocular pressure (IOP) greater than 22.0 mm Hg (measured by Non contact tonometer) on the first post operative day and required topical timolol 0.5% eye drops. Rise in IOP was most likely due to retained viscoelastic after the surgery. IOP returned to normal in all the patients by one week postoperatively.

Postoperatively at the end of 1 month, 24 eyes (88.8%) achieved a best corrected visual acuity (BCVA) of 6/6 to 6/9. Three eyes (11.1%) had a BCVA of 6/12. There were only two cases [7.4%] of severe iritis on first post operative day which resolved by 1 week postoperatively. This could be due to abnormal iris vessels with an increased permeability for proteins in PEX eyes. The low incidence of postoperative inflammatory reaction in the study could be due to the improved surgical technique and use of modern phacomachines with better technologies. There was no case of corneal decompensation, persistent IOP elevation or endophthalmitis in this study.

## CONCLUSION

Phacoemulsification is safe in eyes with cataract and pseudoexfoliation. Awareness about potential complications of cataract procedures in patients with PEX is important to prevent Intraoperative complications. With surgical experience and excluding cases with phacodonesis and zonular weakness, satisfactory postoperative visual gains can be achieved with phacoemulsification in eyes with pseudoexfoliation.

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