Original Article

Cataract Surgery in Patients with Pseudoexfoliation

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Purpose: To study the complications encountered during and after cataract surgery in eyes with pseudoexfoliation and their visual outcome.

Materials and Methods: This non-interventional descriptive study was conducted in the Ophthalmology Department of Lady Reading Hospital, Khyber Institute of Ophthalmic Medical Sciences, Peshawar from June 2002 to December 2002. All patients admitted for cataract surgery during June to September 2002 were examined on slit lamp without and with pupillary dilatation to diagnose pseudoexfoliation. Patients of cataract with pseudoexfoliation above fifty years of age belonging to either sex were included in the study. All patients underwent cataract surgery with intraocular lens implantation. The patients were reviewed up to 60th post-operative day; operative and post-operative complications and the best-corrected visual acuity on 60th post-operative day were measured.

Results: Thirty-two eyes of thirty patients with pseudoexfoliation underwent cataract surgery, of which twenty (67%) were male whereas ten (33%) were female. Complications encountered during surgery were zonular dialysis five (15.6%) cases, posterior capsular rupture five (15.6%), vitreous loss three (9.4%), residual lens matter in five (15.6%) and hyphema in one (3.1%) case. Post-operative complications were severe anterior chamber reaction in 18 (56.2%) cases, corneal oedema 14 (43.8%), raised intraocular pressure five (15.6%), hyphema three (9.4%), pigment dispersion 13 (40.6%), posterior capsular opacification six (18.8%) cases, while iris prolapse, endophthalmitis, intraocular lens decentration and endothelial decompensation in one (3.1%) case each. Final best-corrected visual acuity was between 6/6-6/12 in 18 (56.3%) cases, 6/18-6/36 in ten (31.3%) cases; 6/60 to counting finger in three (9.4%) and one (3.1%) case had visual acuity of hand movement.

Conclusions: Cataract surgery in eyes with pseudoexfoliation has higher incidence of operative complications like posterior capsular rupture, zonular dialysis, vitreous loss and intraocular bleeding. Post-operatively, these patients are at greater risk for developing an immediate elevation of intraocular pressure and inflammation. Posterior capsular opacification and intraocular lens decentration are more common in patients with pseudoexfoliation in post-operative period.

Pseudoexfoliation is an age related disease characterized by production and progressive deposition of protein like abnormal fibrillar extracellular material in the anterior segment of the eye and conjunctiva. The disease may be unilateral or bilateral and usually affects persons over 50 years of age. Pseudoexfoliation is a familial condition and seems to be genetically inherited[1]. The composition and origin of the deposited material is not entirely clear. Exfoliation material may be a form of amyloid or basement membrane material. Fibrillogranular white material is deposited in and on the lens epithelium, iris stroma and blood vessels, corneal endothelium, anterior hyaloid face, zonular fibers, trabecular meshwork and subconjunctival tissue. The deposit is most prominent on the anterior lens capsule and at the pupillary margin[2] (Fig. 1). Similar material has also been detected in skin and connective tissue portions of various visceral organs[3,4]. So pseudoexfoliation is now suspected to be a systemic disorder.

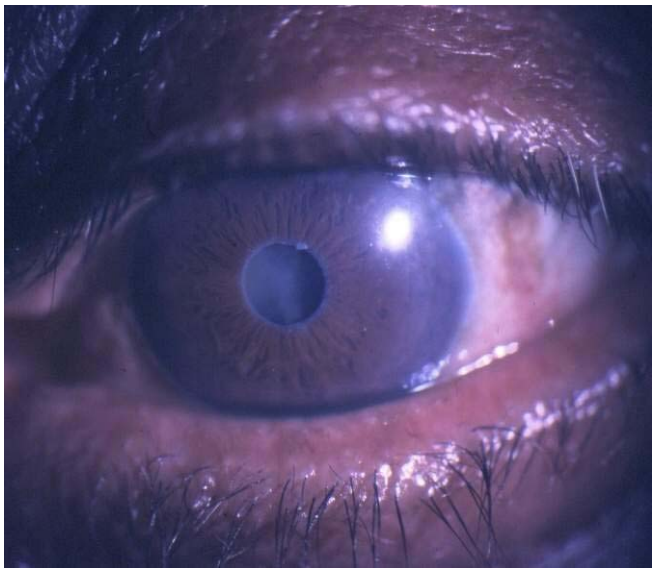


Fig. 1: Left eye: Anterior segment photograph; Pseudoexfoliation of iris at papillary margin.

There is atrophy of iris in eyes with pseudoexfoliation especially at the pupillary margin, which is evident by transillumination. Pseudoexfoliation has been recognized as the most common identifiable cause of glaucoma. Pseudoexfoliation is frequently associated with open angle glaucoma[5] and poor pupillary dilatation[6]. There is increased melanin pigment liberation and deposition throughout the anterior chamber structures. Phacodonesis and iridodonesis are not uncommon and they are most likely related to zonular degeneration and disintegration. Spontaneous lens subluxation occurs in as many as 16% of patients with pseudoexfoliation[7]. Making the diagnosis often requires a careful slit lamp examination after pupillary dilatation, and it frequently goes undiagnosed, leading to unexpected problems in management and during surgery. Cataract surgery on eyes with pseudo exfoliation has higher incidence of complications like posterior capsular rupture, zonular dialysis, intraocular bleeding[8] and vitreous loss during surgery[9]. The exfoliation material may be elaborated even after the crystalline lens is removed. The contraction of the anterior capsule opening and intraocular lens tilt is greater in the pseudoexfoliation eyes than in the healthy eyes [10]. The higher frequency of secondary cataract could be considered as another potential complication of cataract surgery in eyes with pseudoexfoliation[11]. Patients with pseudoexfoliation are reported with delayed spontaneous dislocation of intraocular lens within the capsular bag after uncomplicated cataract surgery[12].

Pseudoexfoliation is being reported with increasing frequency in Pakistan[13]. The study was undertaken at the Ophthalmology Department, Khyber Institute of Ophthalmic Medical Sciences, Lady Reading Hospital, Peshawar. The study was concerned mainly with complications encountered during and after cataract surgery in patients with pseudoexfoliation and their visual outcome.

MATERIALS AND METHODS

This non-interventional descriptive study was conducted on thirty consecutive patients of cataract with pseudoexfoliation above fifty years of age belonging to either sex, admitted to the Ophthalmology Department of Lady Reading Hospital, Khyber Institute of Ophthalmic Medical Sciences, Peshawar. All patients admitted for cataract surgery during June 2002 to September 2002 were examined on slit lamp before and after pupillary dilatation to diagnose pseudoexfoliation. Pseudoexfoliation was defined as the presence of white grayish pseudoexfoliation material on the anterior lens capsule and/ or near the pupil.

Inclusion Criteria

1. Patients diagnosed to have cataract with pseudoexfoliation on the basis of slit lamp examination before and after pupillary dilatation.

2. Patients of cataract with pseudoexfoliation above fifty years of age belonging to either sex.

Exclusion Criteria

1. Patients below fifty years of age.
2. Patients with traumatic cataract.
3. Patients with history of exposure to intense infrared light i.e., glass blowing.
4. Patients with eye diseases other than pseudoexfoliation or early mild cataract.
5. Patients with uncontrolled diabetes mellitus or other severe systemic and cardiovascular diseases and a history of transient ischemic attacks or stroke were excluded.

Informed consent was obtained from all participants before entry into study. A separate data collecting proforma was filled for every patient. Patients underwent cataract surgery with PMMA intraocular lens (IOL) implantation. Patients were discharged on the 1st post-operative day. The patients were reviewed up to 60th post-operative day. The operative and post-operative complications were recorded and best-corrected visual acuity after 60 days was measured.

After completion of the data collection on proforma, it was stored in SPSS (Statistical Package for Social Sciences) 8.0 for Windows statistical package. Statistical analysis of continuous data were made. Frequency of pseudoexfoliation in patients admitted for cataract surgery was made. Mean, median, mode, range and standard deviation (SD) of age & pre and post-operative intraocular pressure (IOP) distribution were determined. Sex distribution and laterality of pseudoexfoliation with cataract, frequencies of different complications encountered during cataract surgery, frequencies of different post-operative complications and their correlation with final visual outcome were determined. Final best-corrected visual acuity on 60th post-operative day was also determined.

RESULTS

Thirty (5.8%) patients had cataract with pseudoexfoliation. Among thirty patients of cataract with pseudoexfoliation twenty (67%) were male whereas ten (33%) were female.

The mean age was 68.8 years (SD ± 7.37); the youngest patient was 55 years old while the oldest patient was 80 years of age (range 25 years). Median and mode age was 70 years. Further analysis of age and sex distribution is given in Fig. 2. Twenty three (76.7%) patients had bilateral cataract with pseudoexfoliation, while seven (23.3%) patients had unilateral cataract with pseudoexfoliation; out of which four were right and three were left sided. Thirty two eyes of thirty patients with pseudoexfoliation underwent cataract surgery of which 20 (62.5%) were right while 12 (37.5%) were left sided. Pre-operative visual acuity is given in Fig. 3. Pre-operative IOP ranged from 6-40 mm Hg with mean of 16.3 mm Hg (SD ± 7.31). Median IOP was 14, while mode was 10 mm Hg.

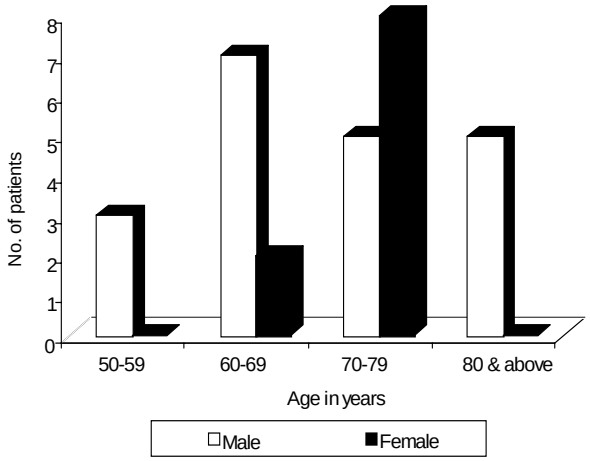
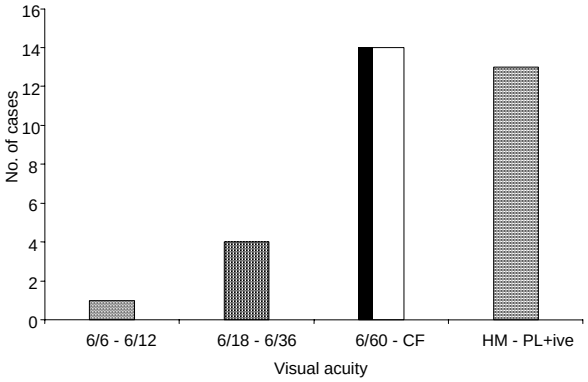


Fig. 2: Age and sex distribution.



CF = Counting fingers, **HM =** Hand movement
PL = Perception of light

Fig. 3: Pre-operative visual acuity.

Three (9.4%) eyes underwent combined extraction, 28 (87.5%) eyes underwent extracapsular extraction while one (3.1%) eye underwent intracapsular cataract

extraction. All 32 eyes had a PMMA IOL implant, 30 (93.8%) eyes had posterior chamber IOL while two (6.3%) eyes received anterior chamber IOL. Peripheral iridectomy was done in eight (25%) eyes; sphinterotomy was done in five (15.6%) eyes and injection carbachol was used in two (6.25%) cases. Complications encountered during surgery are given in Table I.

Table I: Surgical complications

Complications	No. of cases n (%)
Zonular dialysis	5 (15.6)
Posterior capsular rupture	5 (15.6)
Residual lens matter	5 (15.6)
Vitreous loss	3 (9.4)
Hyphaema	1 (3.1)

Re-surgery was required in two (6.3%) cases. One case underwent lens matter wash on 1st post-operative day for residual lens matter. One case needed reposition of prolapsed uveal tissue from wound on 5th post-operative day. Post-operative complications are listed in Table 2. Mean IOP on 60th post-operative day was 12.6 mm Hg (SD ± 2.56). Median and mode IOP was 12 mm of Hg. Best-corrected visual acuity was checked on 60th post-operative day and is given in Fig.4. Causes of decreased visual acuity are given in Table 3.

DISCUSSION

Although pseudoexfoliation occurs in every race, its prevalence varies considerably. It has been reported with increasing frequency in Pakistan, the latest study shows incidence of 1.99% out of 1604 patients[14]. Patients with age related cataracts are elderly and often have coexisting pseudoexfoliation. Our data indicates that the frequency of pseudoexfoliation in patients with age related cataract is 5.8%. This study also indicates that the incidence of the disease is higher among males (67%) than females (33%). This is consistent with the finding of studies done by Mohammad [7] and Naeem [15]. Comparing the frequency of monocular versus binocular involvement our study indicates bilateral involvement to be more common, with ratio of 3:1. Many series have reported similar results[16,17].

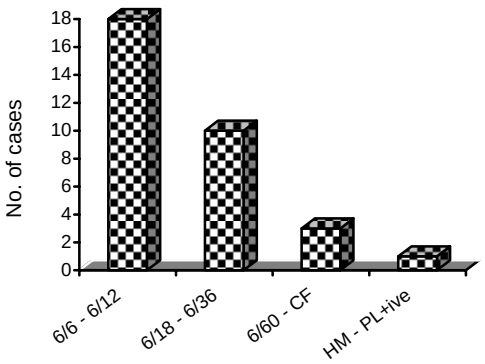
Cataract surgery on eyes with pseudoexfoliation has higher incidence of operative complications like posterior capsular rupture, zonular dialysis, intraocular bleeding[8] and vitreous loss[9]. Pupillary diameter and zonular fragility have been suggested as the most important risk factors for capsular rupture and vitreous loss[18]. Zonular fragility increases the risk of lens dislocation, zonular dialysis or vitreous loss up to ten times [19]. Vitreous loss has been reported to be five times more common than in patients without pseudoexfoliation (9% vs. 1.8%) [18]. This is related to an increased incidence of zonular dialysis, lens dislocation and capsular rupture[20]. In our study posterior capsular rupture (15.6%) was found in patients with poor pupillary dilatation and zonular fragility. This is consistent with previous report that capsular rupture is more common in patients with pseudoexfoliation and has been reported to occur in 27% of pseudoexfoliation eyes as compared to 2% of control eyes[21]. Our data indicates 9.4% of vitreous loss, which is related to zonular dialysis and capsular rupture.

Table 2: Post-operative complications

Complications	No of Cases n (%)
Severe anterior chamber reaction	18 (56.3)
Corneal edema	14 (43.8)
Pigment dispersion	13 (40.6)
Posterior capsular opacification	6 (18.8)
Raised intraocular pressure	5 (15.6)
Residual lens matter	5 (15.6)
Hyphema	3 (9.4)
Posterior synechiae	2 (6.3)
Iris prolapse	1 (3.1)
Endophthalmitis	1 (3.1)
Intraocular lens decentration	1 (3.1)
Endothelial decompensation	1 (3.1)

Table 3: Causes of decreased visual acuity

Causes	No of Cases n (%)
Glaucomatous cupping	7 (21.9)
Posterior capsular opacification	6 (18.8)
Corneal opacity	5 (15.6)
Corneal degeneration	3 (9.4)
Raised intraocular pressure	1 (3.1)
Intraocular lens decentration	1 (3.1)
Endophthalmitis	1 (3.1)
Endothelial decompensation	1 (3.1)



CF = Counting fingers, **HM** = Hand movement, **PL** = Perception of light

Fig. 4: Final best corrected visual acuity.

Post-operatively, these patients are at greater risk of developing an immediate elevation of IOP[22]. In our study 15.6% had raised IOP in immediate post-operative period. Post-operative inflammation is more common in eyes with pseudoexfoliation[19]. Our data indicates similar results, 56.3% cases had severe anterior chamber reaction in immediate post-operative period. 40.6% of our cases had pigment deposition on IOL in post-operative period. Combined cataract and glaucoma surgery decreases the incidence of an acute post-operative rise in IOP[23] and may improve long-term control of IOP. This is consistent with the finding of our study in which three cases underwent combined extraction with normal post-operative IOP. Posterior capsular opacification is increased in eyes with pseudoexfoliation (11%) compared to those without it (9%)[11]. In our study 18.8% of cases had posterior capsular opacification. Intraocular lens decentration is more common even when the lens is entirely in the capsular bag, primarily due to decentration of the entire bag[24]. In our study 3.1% of cases had IOL decentration. Subluxation of the IOL can occur if the zonules break or the capsular bag dislocates.

Limitation of our study was that our follow-up period was 60 days, so late post-operative complications are not evaluated. Also a control group was not available for comparison. Our study was small-scale descriptive study; a larger scale study is required to test the findings in larger population.

CONCLUSIONS

Pseudoexfoliation is not uncommon in patients with age related cataract. It is more common in males over 50 years of age and is usually bilateral. Cataract surgery in eyes with pseudoexfoliation has higher incidence of operative complications like posterior capsular rupture, zonular dialysis, vitreous loss and intraocular bleeding. Post-operatively, these patients are at greater risk of developing an immediate elevation of IOP and inflammation. Posterior capsular opacification and intraocular lens decentration are more common in patients with pseudoexfoliation in post-operative period.

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