

## Operative complications of pseudoexfoliation syndrome – An observational cross-sectional study

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### Abstract

**Background:** Pseudoexfoliation syndrome involves all ocular structures and poses greater risk of eventful surgeries.

**Materials and Method:** 50 patients with both Cataract and PEX were studied about 50 eyes are studied.

**Results:** Mean age group of these patients were 66.28 years and more in males with higher incidence of bilaterally. Major patients had PEX material with 100% patients having different grades of trabecular pigment deposition. Intraoperative complications like, PC rent, Vitreous prolapse, ZD or all was present in 20% of cases.

**Conclusion:** poor dilation of pupils is one of the major pre-op finding in eyes with pseudoexfoliation. Adequate surgical modifications may reduce the intra op complications.

**Keywords:** Intra-operative complications, Pseudoexfoliation Syndrome, Surgical modification.

### Introduction

Pseudoexfoliation Syndrome (PEX) is abnormality involving production and deposition of extra-cellular matrix in vital organs and also in ocular tissues, orbital tissues, skin.

Patients have a higher risk for eventful surgeries. Poor pupillary dilation,<sup>(1-3)</sup> pigment deposition, phacodonesis and zonular dehiscence<sup>(1,4,5)</sup> PC rupture<sup>(2,6,7)</sup> and vitreous prolapse.<sup>(2,8)</sup>

Framingham Eye Study<sup>(9)</sup> revealed the prevalence of PEX to be 0.6% in 52-64 years old, rising to 5% in 75-85 years old. In India, it is 1.88% by Sood,<sup>(10)</sup> 7.4% by Lamba and Giridhar<sup>(11)</sup> and in south India it is 3.8% as per Aravind H et al.<sup>(12)</sup>

Prevalence of PEX increases with age of general population. In sight of the magnitude of clinical problems, we need to know about risks and specially look for clinical signs of this entity. PEX is a potentially catastrophic disease. This study is intended to evaluate the patients for PEX and to know associated intra-operative complications during cataract surgery.

### Materials and Method

Patients attending to Ophthalmology at our Institute during the period from December 2015 to April 2016 were considered for the study.

**Inclusion criteria:** Patients above 50yrs of age in both sexes diagnosed to have cataract with PEX on the basis of ophthalmic examination including fundus pre and post pupillary dilatation were included in this study.

**Exclusion criteria:** Patients less than 50 years of age other than PEX or patients with mild cataract, Transient ischemic attacks, uncontrolled DM, severe systemic and cardio-vascular disease were excluded.

**Preoperative evaluation:** All patients were evaluated for visual acuity, refraction, extra-ocular examination, tonometry, Slit lamp and Gonio with three mirror lens

to record:

- PEX material in the pupils and lens
- Moth eaten appearance of the iris.
- Corneal alterations.
- Chamber depth and pigment dispersion.
- Iridodonesis.
- posterior synechiae.
- PEX material on the anterior surface of the lens.
- Pupil size before & after dilatation.
- Pupillary reactions.
- Extent of trabecular pigmentation.
- Presence of PEX material in the angle.
- Presence of Sampolesi's line
- Angle width.
- Examination of lens capsule for central and peripheral zones of PEX material
- Examination of lens for the type of cataract and Fundoscopy, Lacrimal sac test, Biometry and routine investigation like RBS, urine sugar, ECG, HIV.

### Observation and Results

In our study, 6 (12%) patients are of 50-59 years, 37(74%) patients age was 60-70 years and 7(14%) of age group 71-80% and the average age of patients was 66.28 years.

62% of patients had clinical bilateral PEX. 74% of had PEX material on the pupil margin, 40% on the iris surface, 40% Moth Eaten Appearance of iris, 36% had Iris Atrophy, 5 had Iridodonesis and 12% had posterior adhesion. 86% of patients had open angles.

In 74% patients IOP of 10- 20 mm Hg, in 24% it was 22-30 mm Hg and in 2% it showed more than 30 mm Hg. 56% had sufficient pupillary dilatation. 40% had PEX material in periphery, 60% had deposition of PEX on anterior lens surface. 4% of the patients had

nuclear sclerosis grade 1, 24% had NS grade 2 cataract, 30% had NS grade 3, 38% had mature cataract and 4% had hypermature cataract.

Intra-operative complications occur in 20% of PEX patients and the same are detailed in Table 1.

**Table 1: Intra-operative complications in pex**

Intra OP Complications	Number of Cases	%
Incidence		
Occurred	10	20
Not occurred	40	80
Type of Complication		
Zonular dehiscence	6	12
Posterior capsular rupture	8	16
Vitreous loss	7	14
Complication Vs Insufficient Pupillary Dilatation		
Posterior capsular rent	6	27.3
Vitreous loss	5	22.7
Zonular dehiscence	3	13.6
Complication Vs Sufficient Pupillary Dilatation		
Posterior capsular rent	2	7.14
Vitreous loss	2	7.14
Zonular dehiscence	3	10.71

Out of the total 50 patients, 8 (16%) patients who had complications, Majority (7%) had poor mydriasis. Surgical modifications in the form of sphincterectomy (12%), synechiolysis (10%) and both were performed during cataract surgery in PEX cases.

## Discussion

Study consist of 50 eyes with PEX who underwent cataract surgery. The mean age was 66.28 years. The prevalence of PEX increases by age. PEX occurs between 60 to 80 yrs.

Bilaterality was found to be 62%. Hammer<sup>(13)</sup> in 2001 from his study of 5 pairs of eyes with unilateral PEX has concluded PEX as a bilateral disease with clinically marked asymmetric presentation. Clinically unilateral involvement is often a precursor to bilateral involvement within 5- 10 yrs after diagnosis.

74% of patients had exfoliative material on margin of pupil, 40% on the iris, 40 % had Moth Eaten Appearance, 36% had Iris Atrophy, 10% Iridodonesis and 12% of the patients had posterior synechia. This coincides study by Ritch Schlotzer-Scherhardt<sup>(14)</sup> stated that deposits of PEX material on the iris and pupillary margin are seen in 84% patients. Thus next to the lens, the most prominent and consistent clinical finding is the exfoliative material at the pupillary border.

In studies of patients with PEX, occludable angles are seen in 9-18% of patients by Bruce shields.<sup>(15)</sup> Ritch, Schlotzer-Scherhardt<sup>(14)</sup> by 23% Wishart et al<sup>(16)</sup> noted 32%. Patients who have PEX but not glaucoma should be considered vulnerable to

glaucoma,

Freyler H<sup>(5)</sup> study showed poor dilatation {less than 4 mm} in 19 of 32 patients with PEX who are subjected to cataract surgery. Asano N<sup>(17)</sup> attributed poor mydriasis in PEX to degenerative changes of sphincter and dilator pupille and involvement of the muscle cells in PXE material fiber formation. Repo L.P. et al<sup>(18)</sup> found degenerative changes in both the stromal tissue and in the muscular layer of iris and regarded this as one of the causes for miosis. Alfaite et al<sup>(19)</sup> noticed significant poor dilation (p value < 0.001) in their study of 31 patients with PEX.

Stanila A<sup>(2)</sup> also noted poor pupillary dilatation in the 10 patients with PEX who underwent cataract surgery. Avramides S<sup>(20)</sup> in their study of 84 patients with PEX who underwent surgery, had 61.90% poor pupillary pupillary dilatation.

In the present study, 20% had pigment dispersion after mydriasis. Prince A.M.<sup>(21)</sup> reported that anterior chamber melanin dispersion after mydriasis may be seen as a whorl like pattern of pigment particles on iris sphincter and peripheral iris. Ritch R<sup>(14)</sup> reported pigment after mydriasis to be common and profuse in PEX. Pigment dispersion after mydriasis is one of the suspicious sign to meticulously look out for PEX in preclinical stages.

Rtich<sup>(14)</sup> found peripheral zone of deposits are absent in 20–60% of their cases while Tarkkanen<sup>(22)</sup> found the central zone absent in 18% of cases in his study.

Hietanen J. et al<sup>(24)</sup> have reported nuclear cataract to is more common in PEX. Seland et al<sup>(23)</sup> and Ritch R<sup>(14)</sup> have shown the same.

20% of the patients had intraoperative complication in our study. Schonherrs U et al<sup>(26)</sup> found a significant increase in intraoperative and postoperative complication in eyes with PEX in their study. Scrolloli et al<sup>(25)</sup> seen that PEX patients were more likely to have intraoperative complications during surgery compared to patients without PEX. Freyler H<sup>(5)</sup> found 26 of their 36 patients with PEX undergoing cataract surgery to have intraoperative complication like PC rent, ZD, and Vitreous prolapse.

Many studies in eyes with PEX have quoted the incidence of Zonular dehiscence {ZD} to be 17.90% by Hovding G,<sup>(27)</sup> 13.1% by Avramides S<sup>(20)</sup> and 14.8% by Lumme P.<sup>(6)</sup> Alfaite et al<sup>(19)</sup> in their study of 31 patients found ZD to be more common in eyes with PEX syndrome.

Stanila<sup>(2)</sup> also reported an increased number of PC rent and Vitreous prolapse in their study of 10 eyes with PEX undergoing cataract surgery. Kuchle et al<sup>(28)</sup> found 6.9% of their 11 patients to have intraoperative complication like zonular dehiscence and vitreous loss. Zonular fragility in PEX increases the risk of lens subluxation/dislocation, ZD and vitreous prolapse up to 10 times.<sup>(14)</sup> Lumme P<sup>(6)</sup> found the incidence of vitreous loss to be more in eyes with Posterior capsular{PC} rupture is higher in eyes with

PEX.

Avramides S<sup>(20)</sup> found the incidence of PC rupture and vitreous prolapse to be 10.4% and 7.14% respectively in study of 84 patients with PEX undergoing cataract surgery. vitreous prolapse in eyes with PEX having surgery has been reported by various authors as 11.9% by Kuchle<sup>(29)</sup> and 6.7% by Junemann A. Naumann<sup>(8)</sup> in their study of 72 eyes with PEX found increase incidence for vitreous loss in eyes with PEX as compared to normal eyes. The prevalence of PC rent to be 4.2% in eyes with PEX and 2.8% without.

Out of 8 patients with PC tear, 6 (75%) of them had insufficient dilation. 7 (14%) of the patients who had Vitreous prolapse, 5 (71.4%) of them had insufficient dilation. 6 (12%) of the patients with ZD.

In the current study, total 50 patients, 8 (16%) patients who had one or the other or all of the complications, 6 (75%) of them had insufficient mydriasis. This can be compared with the other studies conducted by Stanilla A,<sup>(2)</sup> Freyler H,<sup>(5)</sup> Asano N et al,<sup>(17)</sup> Repo L.P. et al<sup>(18)</sup> and Avramides S.<sup>(20)</sup>

Alfaite et al<sup>(19)</sup> found out off 31 eyes of PEX undergoing surgery noted significant raise (p value < 0.01) in the need to perform mechanical modification like sphinctrotomy. Kuchle et al<sup>(28)</sup> noted 3.4% of their 76 patients required intra op surgical manipulation of pupil. Vickie Lee<sup>(30)</sup> advocated that small pupils could be enlarged by prosthetic and non – prosthetic methods. Prosthetic techniques include iris hooks and use of pupil expansion devices.

Non – prosthetic techniques include visco-dilation, manual stretching and iris sphincterotomies.

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