

## A Study on Clinical Features of Pseudoexfoliation Syndrome

Santosh V. Patil

Associate Professor, Department of Ophthalmology, Mahadevappa Rampure Medical College, Kalaburagi, Karnataka 585105, India.

### Abstract

*Introduction:* Pseudoexfoliation cataract forms part of pseudoexfoliation syndrome. It is common in the older age group, with most cases occurring in late 60's and early 70's. The reported influence of sex is conflicting with one study showing a female preponderance and the other of males. No hereditary pattern has been established and studies have given conflicting results with regard to positive correlation with HLA typing. *Methodology:* Total numbers of 100 eyes with 100 patients were selected for the study who have presented with cataract and pseudo exfoliation. The present study was conducted in the Ophthalmology department and Patients attending ophthalmic OPD who had any evidence of any material deposit in the anterior segment during routine examination were further evaluated for PEX. *Results:* Majority of patients that is 88 of them had pseudo exfoliative material deposits on pupillary margin next to lens, 53 patients had deposits on iris surface, 42 had moth eaten appearance, 12 had iris atrophy, and 15 had posterior synechiae and 5 had iridodonesis. *Conclusion:* The study included a total of 100 patients of cataract with PEX. The average age of the patients was 65.74 years with a slight male preponderance over females and with increased incidence of bilateral involvement.

**Keywords:** Senile Exfoliation; Capsularexfoliation; Fibrillopathia Epithelio Capsularis.

### Introduction

Pseudoexfoliation syndrome (PXS) is a wide spread systemic disorder characterized by abnormal production and deposition of protein like fibrillar extracellular material in the anterior segment of an eye and extra ocular tissue [1].

White flaky material is deposited on the lens capsule, pupillary margin, iris stroma blood vessels, corneal endothelium, anterior vitreous face, zonules, trabecular meshwork and also in the conjunctiva and orbital structures [2]. The deposit is most prominent on anterior lens capsule and at the papillary margin<sup>3</sup>. Also found on the skin and connective tissue portions of various visceral organs, so it is suspected that pseudoexfoliation is a ocular manifestation of systemic disorder [4]. Pseudoexfoliation cataract forms part of pseudoexfoliation syndrome. It is common in the older age group, with most cases occurring in late 60's and early 70's [5]. The reported

influence of sex is conflicting with one study showing a female preponderance and the other of males. No hereditary pattern has been established and studies have given conflicting results with regard to positive correlation with HLA typing. The condition may be unilateral or bilateral and some unilateral cases may become bilateral with time. Probability of development of exfoliation in fellow eye is 6.8% after 5 years and 16.8% after 10 years.

Signs suggestive of pseudoexfoliation syndrome [6,7].

1. Pseudoexfoliation deposition on lens anterior capsule in pupillary area.
2. Phacodonesis/lens subluxation.

---

**Corresponding Author: Santosh V. Patil,**  
Associate Professor, Department of Ophthalmology,  
Mahadevappa Rampure Medical College, Kalaburagi,  
Karnataka 585105, India.  
E-mail: [sanshrut30@gmail.com](mailto:sanshrut30@gmail.com)

Received on 21.06.2017, Accepted on 07.10.2017

3. Intra stromal haemorrhage (post mydriasis without rubeosis),
4. Pigment dispersion post mydriasis without obvious cause.
5. Poor mydriasis and posterior synechiae without obvious cause.
6. Small AC depth without other reasons for a narrow drainage angle.
7. Pseudoexfoliation deposits on iris margin.

Patients with pseudoexfoliation have high incidence of developing glaucoma. It is frequently associated with open angle glaucoma [8].

There is increased incidence of phacodonesis and/or subluxation of the lens in eyes with PEX syndrome which is reported to be between 8.4% and 10.6% [9].

Pupils of patients with PEX show a diminished response to mydriatic agents, probably for two reasons: the iris becomes fibrotic due to infiltration by the exfoliative material and pupillary movements are mechanically restricted because the exfoliative material adheres to their iris pigment epithelium and anterior lens capsule.

Cataract surgery on eyes with pseudo-exfoliation has higher potential to become complicated and extensive clue to inherent structural weakness like, small pupil, weak zonular support, shallow AC.

Complications will be more Intra-operatively, postoperative, or even in the long term postoperative period.

Intraoperatively Zonular dialysis, posterior capsular rupture, vitreous loss, difficulty in nucleus delivery are more common. Poor pupillary dilatation and zonular fragility have been suggested as most important risk factors for capsular rent and vitreous loss [9]. Phacodonesis, iridodonesis are common and most likely related to zonular degeneration and disintegration.

Spontaneous lens Subluxation tends to occur in patients with PXF [10].

### Methodology

The present study was conducted in the Ophthalmology department and Patients attending ophthalmic OPD who had any evidence of any material deposit in the anterior segment during routine examination were further evaluated for PEX.

### Sample Size

Total numbers of 100 eyes with 100 patients were selected for the study who have presented with cataract and pseudo exfoliation.

### Statistical Method Applied

Simple random sampling method. The data collected was entered on excel spread sheet and analysed using SPSS software version 11.5. Proportion and mean were calculated and the test of significance was used. In the Chi-square test 'p' value of less than 0.05 was considered as significant and less than 0.01 as highly significant.

### Inclusion Criteria

All the patients diagnosed with cataract and pseudoexfoliation on the basis of slit lamp examination before and after pupillary dilatation.

Patients presenting with all types of cataract that is cortical, nuclear, subcapsular and capsular cataract.

### Exclusion Criteria

- Patient with traumatic cataract
- Subluxation of the cataractous lens without PXF
- Previous intra ocular surgery.
- Previous intra ocular laser treatment.
- Patients with secondary cataract, complicated cataract, anterior uveitis.
- Patients with uncontrolled hypertension and uncontrolled diabetes mellitus.

### Pre-Operative Evaluation

Written informed consent was taken from patient,

- Xylocaine sensitivity test was done.
- Keratometry was done.
- A-scan was done to measure axial length and anterior chamber depth.
- Intraocular lens (IOL) power was calculated using SRK-T formula.
- Pupils were dilated adequately by instillation of 1% tropicamide and 5% phenylephrine eye drops every 10 minutes, repeated 3 times, one hour before surgery.
- To sustain the pupil dilatation the anti prostaglandin eye drops such as flurbiprofen was instilled half hourly for two hours before surgery.

## Results

Table 1 shows 100 patients of PEX out of which, 14

**Table 1:** Age distribution in patients with pseudo exfoliation

Age	Number of patients	Percentage
50-59	14	14
60-69	54	54
70-79	27	27
>80	5	5
Total	100	100%

**Table 2:** Anterior chamber depth in patients with pseudo exfoliation

AC depth(mm)	Number of patients	Percentage
<2.5	51	51%
>2.5	49	49%
Total	100	100%

100 patients out of which,  
51 patients had anterior chamber depth less than 2.5mm.  
49 patients had anterior chamber depth more than or equal to 2.5

**Table 3:** Iris Characteristics in Pseudo exfoliation

Iris characteristics	Number of patients	Percentage (%)
PXF deposits on pupillary margin	88	88%
PXF deposits on iris surface	53	53%
Moth Eaten Appearance	42	42%
Posterior synechiae	15	15%
Iris Atrophy	12	12%
iridodonesis	5	5%

PXF deposits on iris surface in 53 patients.  
PXF deposits on pupillary margin in 88 patients.  
Moth eaten appearance seen in 42 patients.  
Iris atrophy seen in 12 patients.  
Posterior synechiae seen in 15 patients  
Iridodonesis seen in -5patients

**Table 4:** Angle Configuration in Pseudo exfoliation

Angle configuration	Number of patients	Percentage (%)
Open angle	92	92
Narrow angle	8	8
Total	100	100%

Out of 100 patients with PXF,  
92 patients had open angle of anterior chamber.  
8 patients had narrow angle.

**Table 5:** Angle characteristics in pseudo exfoliation

Angle Characteristics	Number of Patients	Percentage
Trabecular meshwork hyperpigmentation	63	63%
Trabecular meshwork PEX deposits.	44	44%
Peripheral anterior synechiae	2	2%

Out of 100 patients of PEX,  
63 patients had hyperpigmentation of trabecular meshwork.  
44 patients had PEX material deposits on trabecular meshwork  
2 patients had peripheral anterior synechiae

**Table 6:** IOP in pseudo exfoliation

IOP(In mm of hg)	Number of patients	Percentage
X21	78	78%
22-29	19	19%
>_30	3	3%
Total	100	100%

100 patients with PEX out of which,  
78 patients had IOP less than 21 mmHg.  
19 patients had IOP between 22-29 mmHg.  
3 patients had IOP of 30 mmHg or more.

**Table 7:** Type of Cataract in Pseudo exfoliation

Type of cataract	Number of patients	Percentage
SMC	24	24%
SHMC	6	6%
Nuclear Cataract Grade 1	5	5%
Nuclear Cataract Grade 2	27	27%
Nuclear Cataract Grade 3	38	38%
Total	100	100%

Out of 100 patients with PEX,  
24 patients had cortical cataract (senile mature cataract).  
6 patients had senile hypermature cataract  
70 patients had nuclear cataract out of which, 5 patients had nuclear cataract grade 1. 27 patients had nuclear cataract grade 2. 38 patients had nuclear cataract grade 3.

patients were in age group between 50-59 years. 54 patients were in age group between 60-69 years. 27 patients were in age group 70-79 years. 5 patients were in age 80 and above. Average age group was 65.74 years.

## Discussion

In this study, 14% patients were in the age group of 50-59 years, 54% patients were in the age group of 60-69 years, 27% patients were in the age group of 70-79 years, 5% patients were in the age group of 80 years and above. In this study the average age of patients was 65.74 years, which is in concurrence with the following studies, The prevalence of pseudoexfoliation increases with age which occurs between late 60 and early 70 years.

Lumme P, Lattikainen L (1993) had studied 351 eyes with pseudoexfoliation undergoing cataract surgery which showed that the prevalence of pseudoexfoliation was more in patients above 70 years [11].

Pseudoexfoliation occurs most commonly in the age group of 60-70 years (Duke Elders, 1976).

In the present study, 51 patients had an AC depth of more than or equal to 2.5mm and 49 patients had an AC depth of less than 2.5mm. Similar results were found in the following study, Dr. Amjad Salman et al (2007) found anterior chamber depth to be

significantly shallower in eyes with PEX when compared to eyes without PEX [12].

In this study, 88% patients had PXF material on pupillary margin, 53% had on iris surface, 42% patients showed moth eaten appearance, 10% had iris atrophy, 3% had iridodonesis, 14% patients showed posterior synechiae. Similar results were reported in study done by, Ritschlotzer, Scherhardt (2001) in which deposits of PXF material on the iris sphincter and pupillary margin were seen in 84% of patients [13].

Thus next to the lens pseudoexfoliation material, the most prominent and consistent clinical finding is the pseudoexfoliation material at the pupillary margin.

In the present study, 92% patient had open angle, 8% patient had narrow angle. This is in concurrence with, Ritz, Schlotzer-Scherhardt (2001) noted 23% patient with pseudoexfoliation syndrome and glaucoma to have grade 2 or narrow angle. Wishart et al (1985) noted 32 patients in their study to have narrow angle.

In this study, 37 patients had average pigmentation of trabecular meshwork, 51 patients had moderate pigmentation, 12 had heavy pigmentation and none had absent pigmentation (hyperpigmentation is seen in 63 patients). Extent of the trabecular meshwork pigmentation has been correlated to the degree of intraocular pressure.

This study also showed 44 patients had PEX material in angle and 2 patients had peripheral anterior synechiae. Similar results were reported in the following study, Sunde (1956) found the flakes of pseudoexfoliation material in the angle in 18.75% of patient with pseudo exfoliative glaucoma. But Tarkkhanen (1962) found pseudo exfoliative material in the angle on gonioscopic examination in 46% of glaucomatous eyes and 50% of non glaucomatous eyes. Thus the two conditions can occur simultaneously or separately and the relation between them is not clear.

Schlotzer-scherhardt et al (1992) reported a correlation between the extent of PEX material in angle and PEX syndrome.

In the present study 78% patients had an IOP of 21 mmHg, 19% had an IOP of 22-29mmHg, 3% patients had >30mmHg. Among these 22 patients with high pressure 19 had open angle glaucoma and 3 had secondary angle closure glaucoma.

This finding is in concurrence with the following study, Yanoff and Duker (3rd edition 2008) according to which patients with PEX 20% had increased IOP and glaucoma at the time of diagnosis. Patients with PEX without glaucoma can develop glaucoma because 15% of such patients develop increased IOP in 10 years.

### Conclusion

The patient with pseudoexfoliation syndrome and cataract posted for manual small incision cataract surgery, have to be carefully looked for zonular weakness, insufficient mydriasis, raised IOP, subluxation and dislocation of cataractous lens because these pre operative factors have bearing on the intra operative complications in turn post operative complications also.

### References

1. Bhagat P., Billore O.P., Desai Rupam et al, AIOC. proceedings 2006.p.140.
2. Dutta L. C. section 66 "Pseudoexfoliation Syndrome", modern ophthalmology 1<sup>st</sup> edition, Printed in India; copyright-© 1994 by jaypee brother's Medical Publishers Pvt.Ltd., 463.
3. Prince A.M., Ritch R. clinical signs of Pseudoexfoliation Syndrome. Ophthalmology 1986;93:803-7.
4. Schlotzer-Schrehardt, Koca M.R, Naumann G., Et al. Pseudoexfoliation Syndrome. Ocular Manifestation of a systemic disorder? Arch ophthalmol 1992; 110:1752-6.
5. Duke Elders systemic Disease of lens & vitreous. In Duke Elders s. ed. System of Ophthalmology. Volume XI, ST. Louis: The C.V. Mosby & company, 1969.p.47-57.
6. Shields M.B. Text book of Glaucoma, 6<sup>th</sup> Edition, Philadelphia, Lippincott Williams & Willkins, 2011.p.248-259.
7. Lee Vickie, Maloof Anthony et al "Cataract surgery in pseudoexfoliation syndrome." Comprehensive ophthalmology update 2002 January-February; 3(1):169-170.
8. Sihota Ramanjit, Tandon Radhika. Parsons' Diseases of Eye. 21<sup>st</sup> edition, Churchill Livingstone 2011 .p.295.
9. Brooks A.M.V., Gillies W.E. The presentation and prognosis of glaucoma in Pseudoexfoliation of the lens capsule, Ophthalmology 1988;95:271-6.
10. Carpel E.F. Pupillary dilatation in eyes with Pseudoexfoliation Syndrome. AM J ophthalmol. 1988;105:692-4.
11. Kuchle. M, Naumman H et al. "Pseudoexfoliation syndrome and secondary cataract" British journal of ophthalmology 1997;81:862-866.
12. Bayramlar. Huseyin et al. "Mature Cataracts and Capsular Complications", Cataract and Refractive Surgery Today Europe, March 2008;P.67-69.
13. Albert Galand M.D., Michaelkuchle M.D, Etinne Thacet MD. Multiple surgical challenges of pseudo exfoliation" symposium during the 21<sup>st</sup> Congress of the ESCRS 2004.