

Association between Anterior Chamber Depth and Outcome of Cataract Surgery in Eyes with Pseudo exfoliation Syndrome

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Abstract

Aim: To measure Anterior chamber depth of patients with Pseudo exfoliation syndrome and to look for outcome of Small incision cataract surgery.

Methods: This prospective study carried out at JSS Hospital, Mysore consisted of 100 consecutive patients with Pseudo exfoliation who presented to the outpatient department, between January 2015 to December 2015 and those who underwent Small incision cataract surgery. A detailed ocular evaluation along with Axial length, Anterior chamber depth measured by contact A scan was done. Intraoperative complication was noted.

Results: Mean age was 61.79 ± 7.58 years with Male to Female ratio nearly 3:2. 83% had Anterior chamber depth > 2.5 mm. The commonest intra-operative complication was Zonular dialysis in 10% & Posterior capsular rupture in 2%. Higher incidence of Zonular dialysis was noted in eyes with Anterior chamber depth ≤ 2.5 mm compared to eyes with anterior chamber depth > 2.5 mm and the difference was statistically significant.

Conclusion: Preoperative reduced Anterior chamber depth may indicate Zonular instability in eyes with Pseudo exfoliation and should alert the cataract Surgeon to the possibility of intraocular complications related to Zonular dialysis.

Keywords: Pseudo exfoliation, Anterior chamber depth, Zonular dialysis

I. Introduction

Pseudoexfoliation syndrome may be defined as a discrete clinical entity characterized by the synthesis and deposition of fine white granular material, upon and within ocular and orbital tissues. [1]

It is now considered the most common identifiable specific entity leading to the development of open angle glaucoma. [2]

Renewed interest in this long known entity results from better awareness of the spectrum of intraocular risk, not only for open angle glaucoma but also in conjunction with intraocular surgery especially cataract extraction.

The purpose of this investigation is to measure Anterior chamber depth of patients with Pseudoexfoliation syndrome and to look for outcome of Small incision cataract surgery.

II. Methods

This prospective study was carried out at JSS Hospital, Mysore. The study population consisted of 100 consecutive patients with Pseudoexfoliation who presented to the outpatient department, between January 2015 to December 2015 and those who underwent Small incision cataract surgery. Cataract surgery was done by five senior staff. The operated eye was considered for the study.

The diagnosis of Pseudoexfoliation was made based on:

- Deposition of Pseudoexfoliation material on the pupillary margin.
 - Deposition of Pseudoexfoliation material on the anterior capsule of lens.
- Those patients were then subjected to following Ophthalmic evaluation:
- Recording of relevant ocular and medical history, recording of visual acuity for distance using Snellen's chart.

Slit lamp examination of anterior segment was done to see the following conditions:

- Iris was examined for atrophic changes and deposition of Pseudoexfoliation material.
- Pupillary reaction was noted.
- Intraocular pressure was measured using Perkins hand held Applanation tonometer.
- Gonioscopy was performed with Goldman's 3-mirror gonioscope
- Stereoscopic evaluation of the fundus and optic disc with indirect ophthalmoscope and 90-D lens was done depending upon the media clarity.
- Axial length and Anterior chamber depth was measured using contact A-scan.
- Intraoperative complication was noted.

The Chi-square significant/Fisher Exact test was carried out to find out significance of proportions between mean age of incidence of Pseudoexfoliation in males and females, to correlate Anterior chamber depth with intraoperative complications during cataract surgery.

III. Results

In this prospective study there were 100 patients (eyes) with the evidence of Pseudoexfoliation.

3.1 Age and Gender distribution

The age and gender distribution of the subjects enrolled in the study was as below: (Table 1).

Table 1: Age and Gender distribution

Age in years	Sex		Total
	Female	Male	
40-50	2	2	4
51-60	16	20	36
61-70	21	26	47
>71	4	9	13
Total	43	57	100
Mean age	64±7.83	60.18±7.52	61.79 ±7.58

The mean age of the subjects in the study was 61.79 years. There was a linear increase in the number of Pseudoexfoliation patients with age upto the age of 70 years. Most of the patients were seen in the 61-70 years age group. There were more males with Pseudoexfoliation than females in the study (57 Males vs. 43 Females). The average age at which Pseudoexfoliation was seen was higher in females than in males i.e., females developed the disease at later age than males and this was statistically significant ($p < 0.05$).

3.2 Pattern of distribution of Axial length in Pseudoexfoliation syndrome

Maximum number (79.5%) of eyes had an axial length in the range of 22-24 mm. No predilection towards axial myopia or hypermetropia was noted. (Table 2)

Table 2: Pattern of distribution of Axial length

Axial Length (mm)	Total
< 22	5
22-24	80
> 24	15
Total	100

3.3 Pattern of distribution of anterior chamber depth

Shift in lens iris diaphragm was noted in Pseudoexfoliation syndrome and this can reduce the anterior chamber depth, which can be detrimental to surgical outcome. (Fig 1)

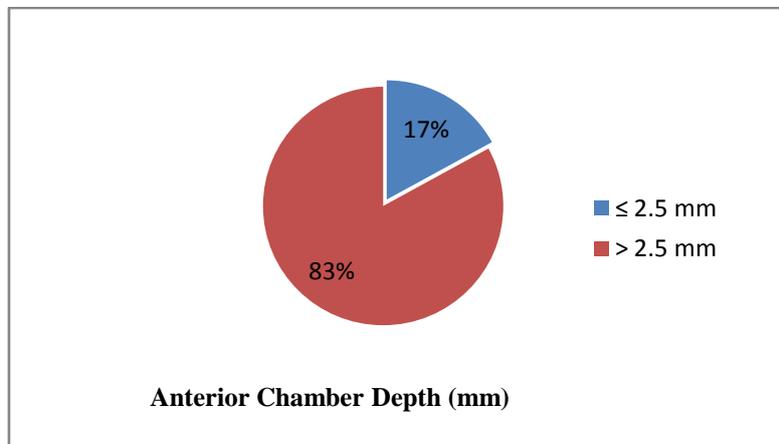


Fig 1: Pattern of distribution of anterior chamber depth

Majority of eyes (83%) had an anterior chamber depth of >2.5 mm indicating there was no obvious shift in lens iris diaphragm.

3.4 Intraoperative complications during cataract surgery in Pseudoexfoliation

Small incision sutureless cataract surgery was done in all patients. The various complications that occurred during the surgery were analyzed. (Table 3)

Table 3: Intraoperative complications during cataract surgery

Intraoperative complications	Zonular dialysis	PC rent	Iridodialysis
No. of eyes	10 (10%)	2 (2%)	1 (1%)

During surgery 13 patients (13%) had intraoperative complications like Zonular dialysis, Posterior capsular rent and iridodialysis. The commonest complication that occurred was zonular dialysis seen in 10 patients (10%). Posterior capsular rupture and iridodialysis occurred in 2 (2%) and 1 (1%) case respectively.

3.5 Association of anterior chamber depth (ACD) with intraoperative complications during cataract surgery

The incidence of intraoperative complications was compared with Anterior chamber depth. The results are tabulated as below (Table 4)

Table 4: Association of anterior chamber depth (ACD) with intraoperative complications

Intraoperative complications	ACD (mm)		Significance
	≤ 2.5 mm	>2.5 mm	
PC rent	--	2 (2.4%)	p>0.05
Zonular dialysis	9 (52%)	1 (1.2%)	p<0.05
Iridodialysis	--	1 (1.2%)	p>0.05
Total	9(35%)	4(4.8%)	

Higher incidence of zonular dialysis was noted in eyes with anterior chamber depth ≤ 2.5 mm compared to eyes with anterior chamber depth >2.5 mm and the difference was statistically significant (p<0.05). (Fig 2)

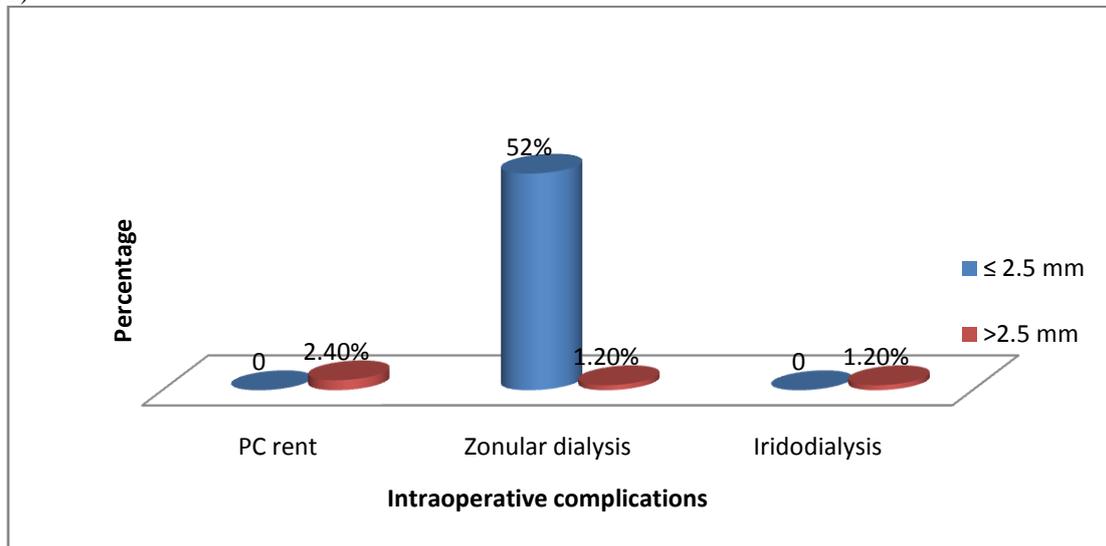


Fig 2: Association of anterior chamber depth with intraoperative complications

IV. Discussion

4.1 Age distribution

The incidence of Pseudoexfoliation increased gradually with age in this study. This is similar to most other studies in India (Arvind H, Raju P et al) [3] and also in other countries (Forsius et al(Scandinavia)[4], Kozobolis VP, Papatzanaki M et al (Greece) [5]. The mean age of patients with pseudoexfoliation was 61.79±7.58 years, which was comparable to the mean age of patients in the study conducted by Arvind H, Raju P et al [3]. The average age of patients in a study conducted by Ruprecht KW, Hoh G (Germany) [6] was 73.2 years, which is higher than the average age in this study.

4.2 Gender Distribution

Males predominated in this study. In Aasved’s (1969) [7] large series collected from Norway, England and Germany, female Pseudoexfoliation patients were in the majority but the gender difference was not

statistically significant. In Southern Europe, males were found in the majority (Montanes JM, Paredes AA et al Spain [8] 1989; Konsta et al Greece [9] 1996).

Most reports from dry and hot countries where the radiation from the sun is strong, show exfoliation syndrome to be more common in males, such as in India (Sood, 1968) [10], in Pakistan (Mohammed S and Kazmi N 1986) [11] Saudi Arabia (Summanen P and Tonjum M 1988) [12]. But Arvind H, Raju P et al found a higher incidence in females, which however was not statistically significant [3].

The mean age of females with Pseudoexfoliation syndrome was higher (statistically significant) than the mean age of males with Pseudoexfoliation. This could mean that men are affected earlier than women by Pseudoexfoliation. Again this could be because most men work outside when compared to women.

4.3 Axial length

Most patients with Pseudoexfoliation had normal axial length of 22-24 mm (80%). No association was found between Pseudoexfoliation and axial myopia or hypermetropia. Various studies have reported myopic shift in their patients and in many it is due to lenticular factor.

4.4 Anterior chamber depth

In Pseudoexfoliation syndrome a shallow anterior chamber depth implies forward movement of lens – iris diaphragm due to zonular weakness. 17% of the eyes in our study had anterior chamber depth ≤ 2.5 mm, but a majority (83%) had anterior chamber depth > 2.5 mm.

In this study, we found that a higher percentage of patients with anterior chamber depth ≤ 2.5 mm had intraoperative complications compared to patients with deeper anterior chamber depth. Kuchle M, Viestenz A et al [13] in their study found an increased incidence of complications in eyes with pseudoexfoliation with anterior chamber depth < 2.5 mm.

4.5 Complications related to cataract surgery in Pseudoexfoliation syndrome

In this study, Zonular dialysis occurred in 10 patients (10%), PC rent in 2%, and iridodialysis in 1%. Avramides S, Traianidis P et al found zonular dialysis in 13%, PC rent in 10.7% [14]. Pirrko Lumme, Laatikainen L [15] reported zonular dialysis in 14.8% and posterior capsular rupture in 10.2%. A higher percentage of complications occurred in patients with anterior chamber depth < 2.5 mm. This finding was similar to the study by Kuchle M, Viestenz A et al [13].

V. Conclusion

In conclusion in this study Pseudoexfoliation was seen more commonly and at an earlier age in males. Preoperative reduced Anterior chamber depth may indicate Zonular instability in eyes with Pseudoexfoliation and should alert the cataract Surgeon to the possibility of intraocular complications related to Zonular dialysis.

References

- [1]. Morrison, Green. Light microscopy of the exfoliation syndrome. *Acta Ophthalmol Scand (Suppl)*. 1988; 184: 5-27.
- [2]. R. Ritch Exfoliation syndrome: The most common identifiable cause of open angle glaucoma. *J Glaucoma*. 1994; 3: 176-8.
- [3]. H. Arvind P. Raju. Pseudoexfoliation in South India. *Br J Ophthalmol* 2003; 87: 1321-23.
- [4]. H. Forsius . Exfoliation syndrome in various ethnic populations. *Acta Ophthalmol (Suppl)*, 1988; 184: 71-85.
- [5]. P. Kozobolis, M. Papatzanaki. Epidemiology of pseudoexfoliation in the island of Crete (Greece). *Acta Ophthalmol Scand*. 1997 Dec; 75(6): 726-9.
- [6]. K. W. Ruprecht, G. Hoh. Pseudoexfoliation syndrome: Clinical and statistical studies. *Klin Monatsbl Augenheilkd*. 1985 Jul; 187(1): 9-13. [MEDLINE].
- [7]. H. Aasved. The geographical distribution of fibrilloglioneuroepitheliocapsularis: So-called senile exfoliation or pseudoexfoliation of the anterior lens capsule. *Acta Ophthalmol (Copenh)*. 1969; 47: 792-810.
- [8]. J. M. Montanes, A. A. Paredes. Prevalence of pseudoexfoliation syndrome in the Northwest of Spain. *Acta Ophthalmol Scand (Copenh)*. 1989; 67: 383-385.
- [9]. G. P. Konstas, D. A. Mantziris. Effect of timolol on the diurnal intraocular pressure in exfoliation and primary open angle glaucoma. *Arch Ophthalmol (Copenh)*. 1997; 115: 975-9.
- [10]. N. N. Sood, A. Ratnaraj. Pseudoexfoliation of the lens capsule. *Orient Arch Ophthalmol*. 1986; 6: 62.
- [11]. S. Mohammed, N. Kazmi. Subluxation of the lens and ocular hypertension in exfoliation syndrome. *Pakistan J Ophthalmol*. 1986; 2: 77-78.
- [12]. P. Summanen, M. Tonjum. Exfoliation syndrome among Saudis. *Acta Ophthalmol Scand (Copenh) Suppl*. 1988; 184 (66): 107-111.
- [13]. M. Kuchle, A. Viestenz A. Anterior chamber depth and complications during surgery in eyes with pseudoexfoliation syndrome. *Am J Ophthalmol*. 2000; 129: 281-5.
- [14]. S. Avramides, P. Traianidis. Cataract surgery and lens implantation in eyes with pseudoexfoliation syndrome. *J Cataract Refract Surg*. 1997 May; 23(4): 583-7.
- [15]. L. Pirrko, L. Laatikainen. Exfoliation Syndrome and Cataract Extraction. *Am J Ophthalmol*. 1993 Jul; 116: 51-55.