

To Determine the Consequences of Pseudoexfoliation Syndrome on Cataract Surgery and the Resulting Complications

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Abstract

Aim: To determine the consequences of pseudoexfoliation syndrome on cataract surgery and the resulting complications

Material and Methods: The present study is a non randomized prospective case series being conducted in Department of Ophthalmology, AIIMS, Patna, Bihar India. All cases of cataract getting admitted for cataract surgery. A total of 50 cases with PES of Cataract surgeries Duration of study is 12 months from the date of sanction of study from ethical committee. Prospective analysis of cases was done using appropriate statistical tests.

Results: The ages of the 50 patients in this study was between 55 and 85 years. Out of these 8 (18%) were in 55-65 years age group, 28 (58%) patients were in 66-75 years age group and 14(24%) patients in were in 76-85 years age group. 28 (56%) were male and 22 (44%) were female. None of the eyes showed frank subluxation of lens. Thirteen cases (25%) required sphincterotomy to facilitate capsulorhexis and nucleus delivery. Four eyes (7.69%) had vitreous loss due to difficulty in surgical manoeuvres. All four patients with vitreous loss were given anterior chamber lenses after doing anterior vitrectomy. Patients were followed on the post-operative day 1, day 7, day 14 and at monthly intervals for 3 months to evaluate intraocular pressure spikes, increased intraocular inflammation, decentration/tilt of intraocular lens and corneal decompensation. Post-operative hazy cornea was seen in 12 (23%) cases. Six cases (11.5%) had significant intraocular inflammation.

Conclusion: Inadequate pupil dilatation, and zonular weakness are the common difficulties associated with small incision or Phacoemulsification cataract surgery in eyes with pseudoexfoliation syndrome.

Keywords: pseudoexfoliation syndrome, cataract surgery, complications

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Introduction

Pseudoexfoliation syndrome (PEX) is a systemic disorder characterized by the progressive accumulation of abnormal fibrillar material in various ocular tissues, particularly the anterior segment of the eye. This condition is associated with an increased risk of developing secondary glaucoma and complications during cataract surgery, making it a significant concern for ophthalmologists and patients alike. [1-3] The hallmark of PEX is the deposition of whitish-gray, fibrillar material on intraocular structures, including the lens capsule, zonular fibers, trabecular meshwork, and corneal endothelium. These deposits can lead to impaired aqueous humor outflow, elevated intraocular pressure (IOP), and subsequent glaucomatous optic neuropathy. Therefore, patients with PEX often present with a range of clinical findings, such as elevated IOP, pseudoexfoliative material visible on the pupil margin (Sampaolesi's line), and characteristic iris transillumination defects. Cataract

surgery in patients with PEX poses several challenges due to the structural changes and compromised integrity of ocular tissues. The presence of pseudoexfoliative material on the lens capsule can make capsulorhexis more difficult and increase the risk of radial tears or incomplete capsulotomy. Furthermore, zonular weakness or dehiscence, a common finding in PEX, can lead to intraoperative complications such as lens subluxation or dislocation, necessitating careful surgical planning and execution. [4-7] In addition to intraoperative challenges, patients with PEX are at higher risk for postoperative complications. These include intraocular inflammation (phacoanaphylactic uveitis), persistent corneal edema, and cystoid macular edema (CME). The heightened inflammatory response associated with PEX may exacerbate these complications, requiring vigilant postoperative monitoring and management. Recent advancements in surgical techniques and

intraocular lens (IOL) technology have aimed to mitigate these challenges in cataract surgery for PEX patients. Specialized IOL designs, such as capsular tension rings (CTRs) or iris-fixated lenses, help stabilize the capsular bag and manage zonular weakness effectively. Moreover, the use of femtosecond laser-assisted cataract surgery (FLACS) has shown promise in enhancing precision and safety during capsulorhexis in eyes with PEX. [8-12] Understanding the impact of pseudoexfoliation syndrome on cataract surgery outcomes is crucial for optimizing patient care and surgical outcomes. This review explores the pathophysiology, clinical implications, surgical considerations, and management strategies related to PEX-associated cataracts, highlighting the evolving approaches to improve visual outcomes and minimize complications in affected individuals. [13-15]

Material and Methods

The present study is a non randomized prospective case series being conducted in Department of Ophthalmology, AIIMS, Patna, Bihar India. All cases of cataract getting admitted for cataract surgery. A total of 50 cases with PES of Cataract surgeries Duration of study is 12 months from the date of sanction of study from ethical committee. Prospective analysis of cases was done using appropriate statistical tests.

Inclusion Criteria:

- Both male and female patients are included
- Age between 55 years to 85 yrs
- Patients willing to participate and willing to give informed consent

Exclusion Criteria:

- Age < 55 years or > 85 years
- History of Previous Intraocular surgery, Traumatic Cataract, Congenital Cataract, and Complicated Cataract.

Patients was selected according to the inclusion and exclusion criteria. After taking informed consent

and reassuring patients regarding expertise and confidentiality Detailed history was taken regarding demographic factors, occupation, previous medical, surgical and ocular history. Examination was done including general physical examination. This cross-sectional descriptive study was carried out on 50 eyes of 50 patients with cataract and PXE who underwent SICS or phacoemulsification surgery in a tertiary care hospital. There preoperative and intraoperative and postoperative complications with visual outcome were documented and analyzed.

Results

Fifty eyes of 50 patients with PXE who underwent cataract surgery by SICS or phacoemulsification technique were included in this study to evaluate the perioperative and post-operative complication. The ages of the 50 patients in this study was between 55 and 85 years. Out of these 8 (18%) were in 55-65 years age group, 28 (58%) patients were in 66-75 years age group and 14(24%) patients in were in 76-85 years age group. 28 (56%) were male and 22 (44%) were female. None of the eyes showed frank subluxation of lens. All patients underwent cataract surgery using SICS technique or phacoemulsification. Surgical complications are listed in Table 1. Thirteen cases (25%) required sphincterotomy to facilitate capsulorhexis and nucleus delivery. Four eyes (7.69%) had vitreous loss due to difficulty in surgical manoeuvres. All four patients with vitreous loss were given anterior chamber lenses after doing anterior vitrectomy. Patients were followed on the post-operative day 1, day 7, day 14 and at monthly intervals for 3 months to evaluate intraocular pressure spikes, increased intraocular inflammation, decentration/tilt of intraocular lens and corneal decompensation. Post-operative hazy cornea was seen in 12 (23%) cases. Six cases (11.5%) had significant intraocular inflammation. The IOP was measured both pre-operatively and postoperatively. We did not find any pressure spikes in any patient. Final visual acuity was recorded after 6 weeks of surgery [Table 2].

Table 1: Surgical Complications in Cataract Surgery for PXE Patients

Complication	Number of Cases	Percentage (%)
Sphincterotomy required	13	25%
Vitreous loss	4	7.69%
Anterior vitrectomy and anterior chamber lenses	4	7.69%

Table 2: Postoperative Complications in PXE Patients

Complication	Number of Cases	Percentage (%)
Hazy cornea	12	23%
Significant intraocular inflammation	6	11.5%
IOP spikes	0	0%

Table 3: Age Distribution of Patients

Gender	Number of Patients	Percentage (%)
Male	28	56%
Female	22	44%

Discussion

Our study evaluated the perioperative and postoperative complications in 50 eyes of 50 patients with pseudoexfoliation syndrome (PXE) who underwent cataract surgery using either small incision cataract surgery (SICS) or phacoemulsification. The patient age ranged from 55 to 85 years, with the majority in the 66-75 years age group. The following discussion compares our findings with other relevant studies.

Age and Gender Distribution

In our study, 56% of the patients were male and 44% were female. The age distribution showed a higher prevalence in the 66-75 years age group (58%). These findings are consistent with the demographic characteristics of PXE, as it is more common in older adults. Damji et al. (1998) [15] reported similar age and gender distribution patterns in their study on PXE, indicating a higher prevalence among older adults and a slight male predominance, corroborating our findings. Kozart and Yanoff (1982) [16] also noted a higher prevalence of PXE among older adults, with a similar male predominance, supporting the demographic trends observed in our study.

Surgical Complications

We observed that 25% of the cases required sphincterotomy to facilitate capsulorhexis and nucleus delivery. Additionally, 7.69% of the cases had vitreous loss, necessitating anterior vitrectomy and the use of anterior chamber lenses. These complications are significant, given the challenges associated with PXE. Naumann and Schlotzer-Schrehardt (2000) [17] highlighted that surgical complications such as zonular weakness, capsular rupture, and vitreous loss are common in PXE patients undergoing cataract surgery. Their findings indicated a similar rate of complications, emphasizing the need for careful surgical planning and technique modification in PXE patients. Ralla et al. (2019) [18] reported that PXE patients undergoing cataract surgery faced increased risk of complications such as zonular dehiscence and vitreous loss, with rates comparable to our findings.

Postoperative Complications

Postoperative hazy cornea was seen in 23% of the cases, and 11.5% of the cases exhibited significant intraocular inflammation. However, no cases showed intraocular pressure (IOP) spikes. The final visual acuity was recorded after 6 weeks, showing satisfactory outcomes for the majority of the

patients. Konstantopoulos et al. (2013) [19] reported that postoperative complications in PXE patients undergoing cataract surgery include corneal decompensation and increased inflammation. Their study found similar rates of postoperative inflammation but a higher incidence of IOP spikes, suggesting that careful postoperative monitoring is essential for managing PXE patients. Shingleton et al. (2003) [20] found that postoperative complications such as corneal edema and increased intraocular inflammation are common in PXE patients. Their study also highlighted the importance of monitoring IOP postoperatively, despite our findings showing no pressure spikes. Lindberg and Djerf (2003)²¹ reported postoperative inflammation in 15% of their PXE patients, which is consistent with the rates observed in our study.

Conclusion

Inadequate pupil dilatation, and zonular weakness are the common difficulties associated with small incision or Phacoemulsification cataract surgery in eyes with pseudoexfoliation syndrome. Careful surgical evaluation and communication with the patient regarding increased surgical risks should be given in patients with Pseudoexfoliation syndrome. Early diagnosis, detailed ocular examination, beforehand preparedness for and management of intraoperative surgical complications and postoperative outcome associated with pseudoexfoliation improves surgical outcomes.

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