

## MANAGEMENT OF INTRAOPERATIVE COMPLICATIONS AND VISUAL OUTCOME IN PATIENTS HAVING CATARACT WITH PSEUDOEXFOLIATION SYNDROME

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**ABSTRACT: PURPOSE:** To study the intra-operative complications and their management in patients having cataract with pseudoexfoliation syndrome and assess their post-operative visual outcome. **METHODS:** Retrospective analysis of 500 eyes of 500 patients having significant cataract with PEX undergoing MSICS after complete pre-operative assessment and follow-up on 1<sup>st</sup>, 3<sup>rd</sup>, 7<sup>th</sup>, 15<sup>th</sup>, 28<sup>th</sup> day and at the end of 6 weeks. All MSICS were done by the same surgeon. **RESULTS:** Out of 500 cases with cataract and pseudoexfoliation syndrome, 450 (90%) patients got BCVA as 6/6–6/18 post-operatively. The most common complication seen was zonular dehiscence followed by PCR and vitreous loss. **CONCLUSION:** This study demonstrated an increased incidence of intra operative complications in patients having PEX with cataract undergoing MSICS.

**KEYWORDS:** Intra-operative complication, Cataract, PEX.

**INTRODUCTION:** Pseudoexfoliation syndrome (PEX) is a systemic microfibrilopathy that targets ocular tissues through the gradual deposition of fibrillary residue from the lens and iris pigment epithelium mainly on the capsule, ciliary body, zonules, corneal endothelium, iris.

Early Science, Clinical complications and Surgical complications of Exfoliation Syndrome.

Tissue Involvement	Clinical Signs	Clinical Complications	Surgical Complications
1. Cornea	<ul style="list-style-type: none"> <li>Atypical cornea guttata</li> </ul>	<ul style="list-style-type: none"> <li>Endothelial decompensation</li> <li>Endothelial proliferation</li> </ul>	<ul style="list-style-type: none"> <li>Endothelial decompensation</li> </ul>
2. Trabecular Meshwork	<ul style="list-style-type: none"> <li>Pigment deposition</li> <li>Marked asymmetry of IOP</li> <li>Marked IOP rise after pupillary dilation</li> </ul>	<ul style="list-style-type: none"> <li>Intraocular HTN</li> <li>Open-angle glaucoma</li> </ul>	<ul style="list-style-type: none"> <li>Post-operative IOP rise</li> </ul>
3. Iris	<ul style="list-style-type: none"> <li>Peripupillary atrophy and iris sphincter region transillumination</li> <li>Melanin dispersion associated with</li> </ul>	<ul style="list-style-type: none"> <li>Melanin dispersion</li> <li>Poor mydriasis</li> <li>Iris rigidity</li> <li>Blood-aqueous barrier impairment</li> <li>Pseudouveitis</li> <li>Anterior chamber</li> </ul>	<ul style="list-style-type: none"> <li>Miosis/poor surgical access</li> <li>Intra or post-op hyphema</li> <li>Post-op inflammation</li> </ul>

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	<p>pupillary dilation</p> <ul style="list-style-type: none"> <li>• Poor mydriasis, asymmetric pupil sizes</li> </ul>	<p>hypoxia</p> <ul style="list-style-type: none"> <li>• Posterior synechiae</li> </ul>	<ul style="list-style-type: none"> <li>• Prolonged blood-aqueous barrier breakdown</li> <li>• Posterior synechiae and pupillary block</li> </ul>
4. Lens, ciliary body and zonules	<ul style="list-style-type: none"> <li>• Diffuse precapsular layer</li> <li>• Phacodonesis</li> <li>• PEX deposits on zonules</li> </ul>	<ul style="list-style-type: none"> <li>• Cataract</li> <li>• Phacodonesis</li> <li>• Lens subluxation</li> <li>• Angle closure glaucoma due to pupillary and ciliary block</li> </ul>	<ul style="list-style-type: none"> <li>• Zonular rupture/dialysis</li> <li>• Vitreous loss</li> <li>• PCR</li> <li>• Decentration of lens implant</li> <li>• Anterior capsular fibrosis</li> <li>• Secondary cataract</li> </ul>

PEX syndrome is associated with nuclear cataracts (hard cataracts) in majority of cases, the second being posterior subcapsular variety. It is really challenging for the surgeon to minimize the intra-operative complications for a better visual outcome and also to predict the visual outcome since the extent of optic nerve damage will not be known in denser cataracts.

The difficulties experienced by the surgeon in terms of assessing the extent of cupping, combined with shallow AC, rigid pupil, zonular dehiscence/subluxation determine the intra-operative complications and post-operative visual outcome. The incidence of phacodonesis and/or subluxation of the lens in eyes with pseudoexfoliation syndrome have been reported is between 8.4% and 10.6%. The small pupillary diameter and zonular fragility are presumed to be the most important risk factor for capsular rupture and vitreous loss during cataract surgery. Zonular instability increases the risk of lens subluxation, zonular dialysis or vitreous loss up to ten times.

Use of appropriate surgical steps like iris hooks for stretch pupilloplasty, CTR (Capsular Tension Ring) for zonular dehiscence combined with anterior vitrectomy wherever necessary facilitate the surgeon to manage intra-operative complications effectively with reasonable good visual outcome.

Pre-operative assessment with well dilated pupil under slit lamp by an experienced surgeon is very much essential for accurate assessment. In cases where fundal view is not good, the extent of optic nerve damage can only be assessed based on visual acuity, perception of light and projection of rays.

The study was conducted from January 2008 to January 2013 in camp patients.

### AIMS AND OBJECTIVES OF THE STUDY:

1. To study the intra-operative complications.
2. Management of intra-operative complications.
3. Assessment of post-operative outcome.

### MATERIALS AND METHODS:

**SAMPLE SIZE AND STUDY DESIGN:** Retrospective analysis of 500 eyes of 500 camp patients having PEX syndrome with significant cataract undergoing MSICS during the study period were included in the study and followed-up for three months.

**INCLUSION CRITERIA:** All patients with PEX syndrome with significant cataract were included in the study.

**EXCLUSION CRITERIA:**

1. PEX patients who have undergone trabeculectomy were excluded.
2. Patients with advanced glaucomatous optic damage were excluded.
3. Patients with pre-existing corneal opacity and posterior segment pathology causing poor vision like diabetic maculopathy ARMD were excluded.
4. Lens natans were excluded.

**METHODOLOGY:**

**Pre-operative Assessment:** Detailed pre-operative examination was done in all cases. Tests like visual acuity, measurement of intra-ocular pressure, slit lamp examination with widely dilated pupil after instillation of 1 drop of tropicamide with phenylephrine every 10 minutes for half an hour were done.

PEX material was noted on pupillary margin and over anterior lens capsule in all cases. Pupillary size, after half an hour of mydriatic instillation, was assessed. An effort was also made to look for zonular dehiscence and phacodonesis, wherever there was suspicion. Cataract was graded into PSC, NS II, NS III, NS IV and total cataract. Fundus examination using direct ophthalmoscopy, indirect ophthalmoscopy and 78D was done and graded as normal, mild and moderate optic nerve head damage where view was fairly good.

**INTRA-OPERATIVE MEASURES:** Following aseptic precautions, surgeries were conducted under peribulbar anaesthesia. Scleral incisions were planned according to keratometric readings and type of cataract. Incision were made in steeper meridian. In denser cataracts like NS IV, total cataracts and in cases of subluxation of lens superior incision were taken irrespective of keratometric reading. Incisions varied from 6 to 6.5 mm depending upto the hardness of cataract.

Wherever pupil diameter was less than 4 or 4.5 mm, additional dilatation was required. In such cases, stretch pupilloplasty was performed using iris hooks and care was taken not to stretch the pupil larger than 5 mm square since overstretching could produce an irregular atonic pupil post-operatively. If zonular weakness were significant, the use of iris hooks could additionally support the anterior capsulotomy.

CCC was performed in majority of cases and in some cases it was converted to can-opener capsulotomy. Hydroprocedures followed by nucleus expression were done using visco cannula. In the bag placement was done in majority of cases after thorough cortical wash.

In cases, where zonular dehiscence < 4 clock hours was noted capsular tension ring procedure were done. Those who had dehiscence and subluxation of > 4 clock hours, underwent planned aphakic surgery with vectis lens extraction, anterior vitrectomy and suturing wherever necessary.

**POST-OPERATIVE MEASURES:** During the post-operative period, patients were put on:

1. Topical prednisolone 1% and cycloplegics

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- Additional treatment like antiglaucoma medications and systemic steroids was administered in selected patients.

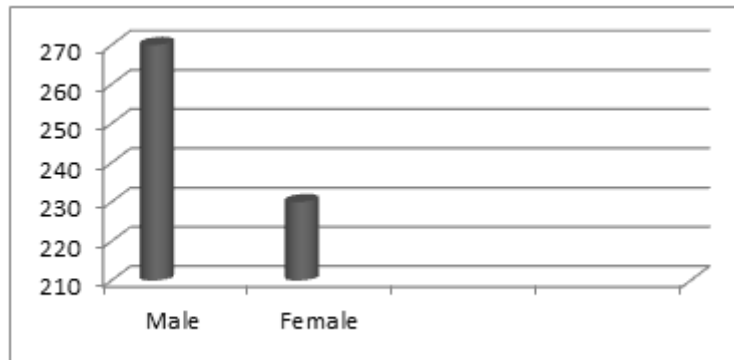
Patients were followed up on 1<sup>st</sup>, 3<sup>rd</sup>, 7<sup>th</sup>, 15<sup>th</sup> and 28<sup>th</sup> day and at the end of 6 weeks to evaluate IOP spikes, increase in intraocular inflammation, decentration/tilt of IOL and corneal decompensation. Visual acuity and refraction were done at the end of 6 weeks.

### STATISTICAL ANALYSIS:

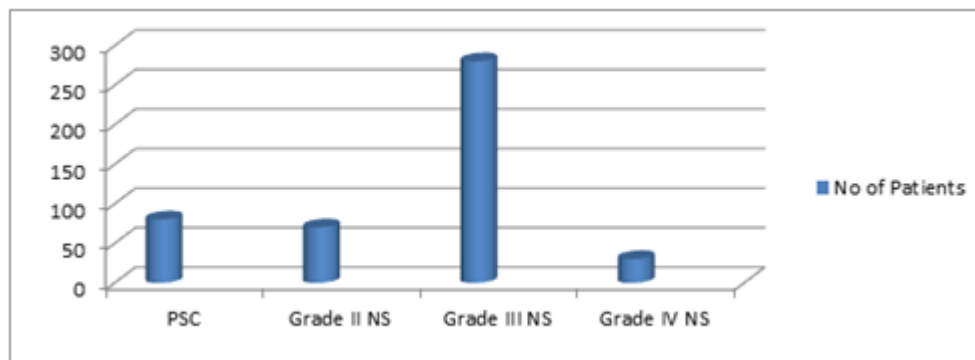
- Chi Square Test.
- Test of Significances.

### RESULTS:

- A total of 500eyes of 500 cases of cataract with PEX undergoing MSICS were analyzed.
- Most of the patients were in the age group of 61 to 70 years and 270 patients were males while 230 were females.

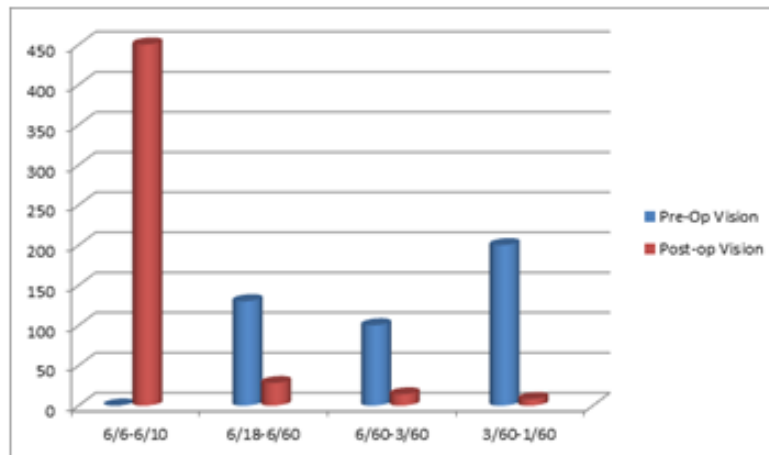


- Nuclear cataract grade III was the most common type of cataract in PEX patients.



## ORIGINAL ARTICLE

4. BCVA of 6/6 – 6/18 at the end of 6 weeks was achieved in 450 (90%).



5. Most common cause of poor vision post operatively was cystoid macular edema (CME).

		Frequency
Valid	Decentered IOL	5
	CME	32
	Cornea decompensation	5
	Gross astigmatism	8
	<b>Total</b>	<b>50</b>

**CAUSE OF POOR VISION POST OP**

Chi-Square	38.755
df	3
Asymptotic Significance	.000

6. The most common intra-operative complications seen were zonular dehiscence followed by PCR and vitreous loss.

	Frequency
Accidental iridodialysis	4
PCR	50
Vitreous loss	40
Zonular dehiscence	52
Retained cortical matter	30
Decentred IOL	5
<b>Total</b>	<b>181</b>

Chi-Square	75.740
df	5
Asymptotic Significance	.000

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7. The most common immediate post-operative complication was anterior chamber reaction followed by acute IOP elevation and corneal edema.

Anterior Chamber reaction	80
Corneal edema	42
Decentered IOL	5
Retained Cortical matter	30
Acute IOP elevation	50
<b>Total</b>	<b>207</b>

Chi-Square	72.928
df	4
Asymptotic Significance	.000

**DISCUSSION:** PEX is a relatively common finding in elderly patients undergoing cataract surgery but preoperative detection may be missed if the eyes are not seen under slit lamp. One study reported that an axial anterior chamber depth of less than 2.5 mm increases risk of surgical complications fivefold. The amount of exfoliative material in the zonules does not seem to be predictive of intra operative zonule weakness.

In the present study, most frequent problem encountered was rigid pupil (60%) similar to study done by Carpel (94.1%) and Alfaiate et al (48.4%). Various intra operative complications encountered in this study are zonular dehiscence, PCR, vitreous loss, retained cortical matter, iridodialysis and decentred IOL which is similar to various previous studies. Rate of vitreous loss varied from 0% to 11% across different studies.

**CONCLUSION:** This study demonstrated an increased incidence of intra operative complications in patients having PEX with cataract undergoing MSICS. PEX presents challenges that must be adequately addressed with proper pre-operative preparation, surgical care and post-operative follow-up.

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