IJMPR, 2025, 9(12), 52-58

ISSN: 2319-5878

INTERNATIONAL JOURNAL OF MODERN PHARMACEUTICAL RESEARCH

www.ijmpronline.com

Research Article

Impact Factor: 6.669

Coden USA: IJMPR3

PREOPERATIVE AND INTRAOPERATIVE SURGICAL CHALLENGES IN SENILE PSEUDOEXFOLIATION (PXF) CATARACT CASES AND SENILE CATARACT WITHOUT PXF – A COMPARATIVE PROSPECTIVE STUDY

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Article Received on: 05/11/2025 **Article Revised on: 25/11/2025** **Article Published on: 01/12/2025**

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https://doi.org/10.5281/zenodo.17811350

How to cite this Article: Dr. Soniya Upase*[1], Ret. Dr. (Col) S.K. Srivastava[2], Dr. Rajashree Bane[3], Dr. Arundhati Pande[4]. (2025). Preoperative And Intraoperative Surgical Challenges In Senile Pseudoexfoliation (Pxf) Cataract Cases And Senile Cataract Without Pxf – A Comparative Prospective Study. International Journal of Modern Pharmaceutical Research, 9(12), 52–58.

ABSTRACT

Background: Pseudoexfoliation (PXF) syndrome is an age-related common condition characterized by deposition of fibrillar material on ocular structures, leading to increased surgical challenges during cataract extraction surgery. This study aimed to compare preoperative and intraoperative surgical challenges in senile cataract cases with and without pseudoexfoliation. **Methods:** A prospective comparative study was conducted on 180 patients, including 90 with senile PXF cataract and 90 with senile cataract without PXF. Preoperative assessment included slit- lamp examination, evaluation of pseudoexfoliative material, pupillary dilation, intraocular pressure, lens status, pre-existing zonular dialysis, glaucoma evaluation, fundus examination. All cases underwent standard phacoemulsification or small-incision cataract surgery (SICS) under similar surgical settings. Intraoperative parameters such as poor pupillary dilation, zonular weakness, phacodonesis, capsular rupture, vitreous loss, and intraocular lens (IOL) implantation difficulties were recorded and compared. **Results:** Intraoperative complications were more frequent in the PXF group. Poor pupillary dilation ($p<0.0001$) and zonular dialysis ($p<0.0001$), Interventions for small pupil more frequent in cases with PXF ($P<0.0001$), Intraocular pressure (<0.001) were significantly higher in PXF eyes. Chi square test was applied as a test of significance. Capsular rupture and vitreous loss occurred more often in PXF cases than in the non-PXF group. **Conclusion:** Senile cataract cases with pseudoexfoliation present greater intraoperative challenges due to poor pupillary dilation and zonular dialysis, raised intraocular pressure. Meticulous preoperative evaluation, well planned surgical approach, and availability of intraoperative aids are essential to minimize complications and achieve optimal surgical outcomes.

KEYWORDS: Pseudoexfoliation syndrome, senile cataract, intraoperative complications, pupillary dilatation zonular weakness, phacoemulsification, small-incision cataract surgery, Chi square test.

KEYWORDS

CTR	-	Capsular Tension Ring
ECCE	-	Extra Capsular Cataract Extraction
ICCE	-	Intra Capsular Cataract Extraction
IOP	-	Intra Ocular Pressure
IOL	-	Intra Ocular Lens
MCTR	-	Modified Capsular Tension Ring
NS	-	Nuclear Sclerosis
NSAIDS	-	Non Steroidal Anti-inflammatory Drugs
ODV	-	Oculoviscosurgical Devise
PXF	-	Pseudoexfoliation
PXM	-	Pseudoexfoliation Material
PXS	-	Pseudoexfoliation Syndrome

PXG	-	Pseudoexfoliation Glaucoma
PSC	-	Posterior Subcapsular Cataract
PMMA	-	Poly methyl methacrylate
PCIOL	-	Posterior Chamber Intra Ocular Lens
SICS	-	Small Incision Cataract Surgery

INTRODUCTION

Cataract has been documented to be the most significant cause of bilateral blindness in India where vision < 20/200 in the better eye on presentation is defined as blindness. In India cataract has been reported to be responsible for 50-80% of the bilaterally blind in the country. Recent data between 2007 and 2019 from the World Health Organization (WHO) shows that there is a 47% decrease in blindness prevalence and visual impairment by 51.9% in India. This could be due to the increased cataract surgeries in the country. At the same time the proportion of the aged has also increased significantly in the country. Still cataract remains the leading cause of blindness accounting for 66.2%.

Pseudoexfoliation syndrome is risk factor for development of cataract. Pseudoexfoliation syndrome (PXS) is defined as a discrete clinical entity characterized by synthesis and progressive accumulation of fine white granular material in many ocular tissues.

Eyes with PXS have a greater frequency of complications at the time of cataract extraction, such as zonular dialysis, capsular rupture, and vitreous loss.

Recognition that the patient has PXS is of clinical significance, especially because it indicates chances of raised IOP that can lead to a glaucoma in which the optic nerve may become damaged rapidly, association of poor pupillary dilataion, Deposition of PXF material on corneal endothelium, abnormalities in the lens capsule and zonular weakness that can lead to phacodonesis all these predispose to complications at the time of cataract extractions surgery.

So present study was planned to compare complications of cataract surgery in cases of senile cataract with pseudoexfoliation syndrome and senile cataract without PXF. In the present study we did use of iris hooks, mechanical dilation, viscomydriasis for non-dilating/mid-dilating pupil. CTR rings for zonular dialysis, meticulous post operative care.

This study has recommended preventive measures and possible management for intraoperative complications and better surgical outcome to improve quality of life of patients after cataract surgery.

MATERIALAND METHODS

The present study is a hospital based study to compare complications of cataract surgery in cases of senile cataract with pseudoexfoliation syndrome and senile cataract with out pseudoexfoliation syndrome and recommend preventive measures and possible management for intraoperative complications and better surgical outcome to improve quality of life of patients after cataract surgery.

Place of study:- Tertiary healthcare centre

Study population:- Patients from ophthalmology OPD screened for of senile cataract with PXF syndrome and without PXF syndrome.

Study design:- The present study is a hospital based prospective study.

Inclusion criteria: patients from ophthalmology OPD, cases of senile cataract with PXF syndrome undergoing cataract surgery and equal no of cases of senile cataract without PXF syndrome. All surgeries were done by one surgeon only.

Exclusion criteria

Traumatic Cataract,
Complicated cataract
High Myopia

Sample size: - Sample size calculated on the basis of medical records available in MRD of SKNMC
In two years approx 90 cases of senile cataract with pseudoexfoliation syndrome were operated. N=90 of senile cataract with pseudoexfoliation syndrome
Group 1= Cases operated with PXF
Group 2= Cases operated without PXF

- **Research instrument** (Questionnaire): - The questionnaire consists of the following information. (Detailed questionnaire given in annexure)

a) Personal information
b) Presenting complaints with duration

Past history, Personal History and Family history

Detailed Eye examination with Slit lamp biomicroscopy done and important findings noted including status of cornea, pupillary dialatation, grading of cataract, zonular dialysis, fundus examination, glaucoma work up where necessary.

G) **During Surgery RE LE**

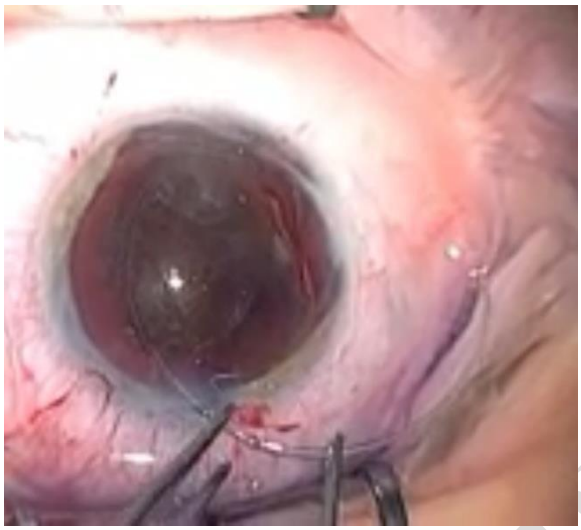
1. Type of surgery……SICS……Phaco……..
2. Problems During surgery……

a) ZD-Y/N.....b).,VL-Y/N.....c),subluxation/dislocation-Y/N……

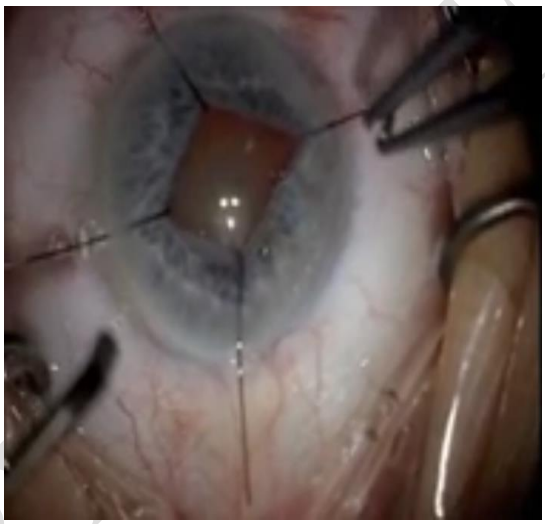
c) Non dilatation of … Pupil……Y/N…….
3. Use of CTR…Y/N…… ……...
4. Management by Vitrectomy…Y/N……
5. Type of IOL ……..
6. Position of IOL……

PRE AND INTRA OPERATIVE INTERVENTIONS

Depending on the grade of cataract, surgeries were performed. Hard and mature cataracts were operated by manual SICS and lower grades were operated by phacoemulsification cataract surgery in both the groups. All patients underwent cataract surgery as follows: Group I – Senile Cataract with PXF Group II- Senile cataract without PXF.



Use Of CTR



Use Of Iris Hooks

RESULTS AND DISCUSSION

Table 1: Type of surgery wise distribution of cases in group I and group II.

Sr. No	Type of surgery	Group I	Group II	Total
1	Manual SICS	51	38	89
2	Phaco Emulsification	39	52	91
3	Total	90	90	180

Chi-square = 3.756, P<0.001

Pearson's chi square test used as test of significance. Chi-squared value worked out to be 3.756, which is statistically not significant. (p<0.001).

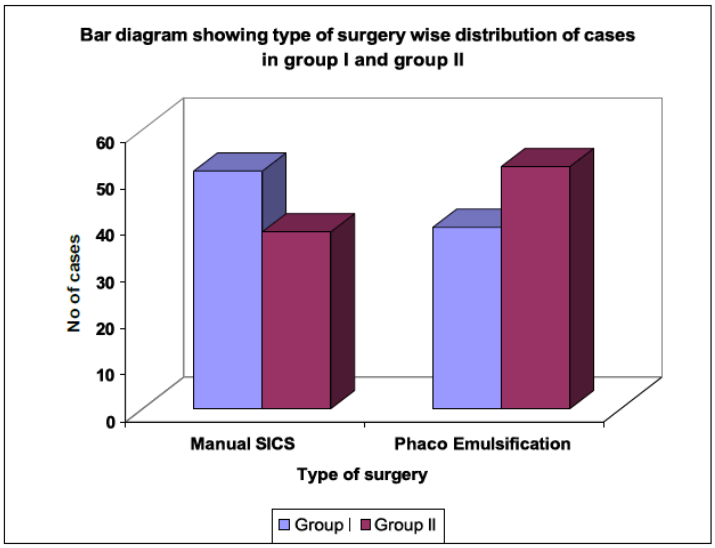


Table 2: Type of IOL wise distribution of cases in group I and group II.

Sr. No	Type of IOL	Group I	Group II	Total
1	Posterior chamber IOL	70	89	159
2	Posterior chamber IOL with CTR	20	1	21
3	Total	90	90	180

Chi-square = 19.46, P<0.0001

Chi-squared value worked out to be 19.46, which is statistically significant (p<0.0001).

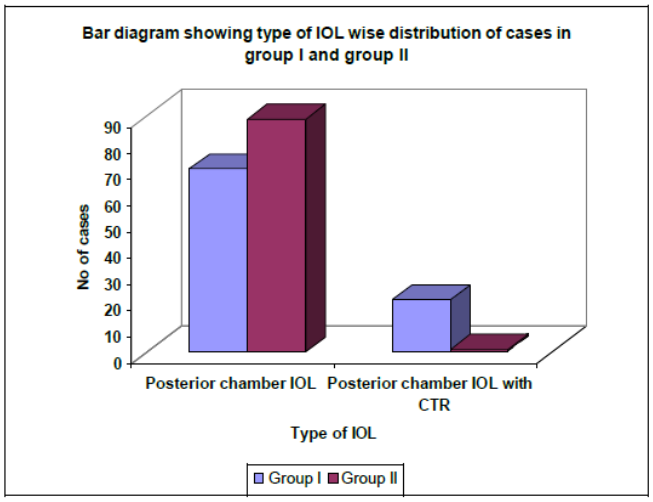


Table 3: Pupillary dilation wise distribution of cases in group I and group II.

Sr. No	Pupillary dilation	Group I	Group II	Total
1	Fully dilated	36	82	118
2	Mid dilated	35	6	41
3	Non dilated	19	2	21
4	Total	90	90	180

Chi-square = 52.21, P<0.0001.Chi-squared value worked out to be 52.21, which is statistically significant (p<0.0001).

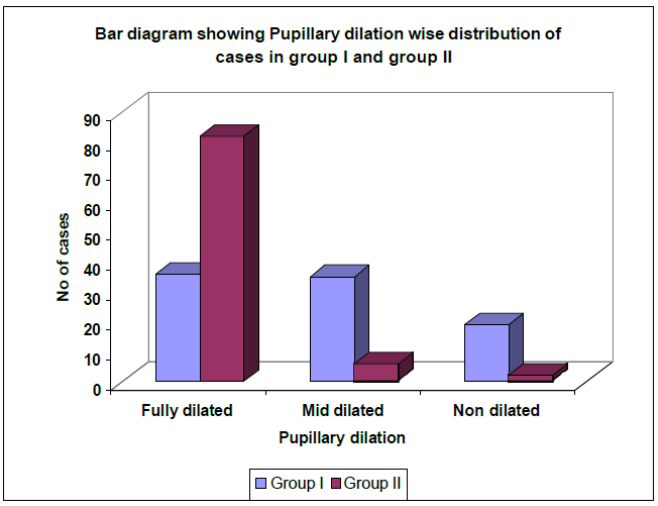


Table 4: Zonular dialysis wise distribution of cases in group I and group II.

Sr.No	Zonular dialysis	Group I	Group II	Total
1	<4Hrs	20	1	21
2	>4Hrs	13	0	13
3	Absent	57	89	146
4	Total	90	90	180

Chi-square = 37.20, P<0.0001. Chi-square value worked out to be 37.20 which is statistically highly significant. (p<0.0001)

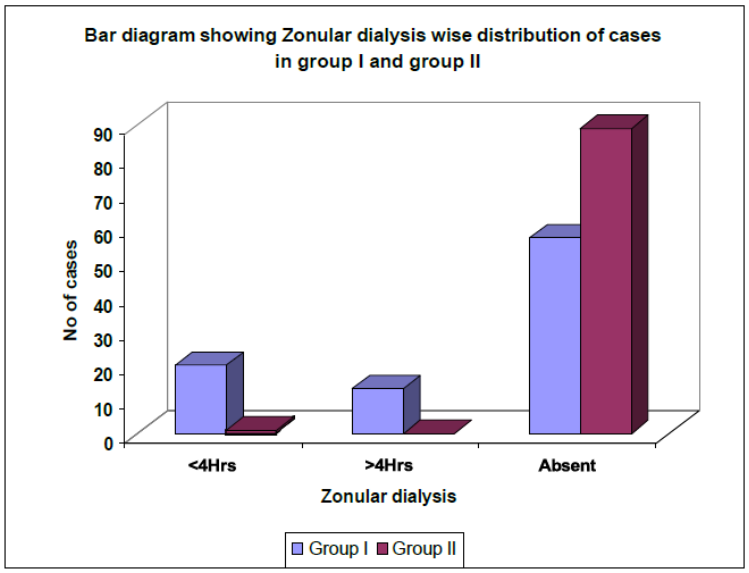


Table 5: Intervention for small pupil wise distribution of cases in group I and group II.

Sr. No	Intervention for small pupil	Group I	Group II	Total
1	IRIS Hooks	20	3	23
2	Mechanical dilation	10	1	11
3	Viscomydriasis	23	6	29
4	No	37	80	117
5	Total	90	90	180

Chi-square = 45.69, P<0.0001

Mechanical Chi-squared value worked out to be 45.69, which is statistically significant (p<0.0001).

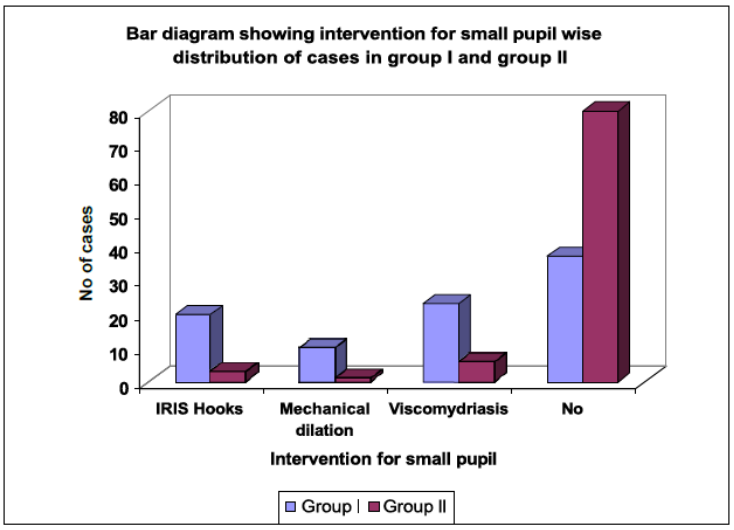


Table 6: Intervention for Zonular dialysis wise distribution of cases in group I and group II.

Sr. No	Intervention for Zonular dialysis	Group I	Group II	Total
1	CTR inserted	20	2	22
2	No	70	88	158
3	Total	90	90	180

Chi-square = 16.78, P<0.0001

Chi-square value worked out to be 16.78 which is statistically highly significant. (p<0.0001)

CAUSES FOR CONCURRENT VITRCTOMY

Sr. No	Cause	Group I	Group II
1	Pre-operative Zonular Dialysis (More than 4 colck Hours)	13	0
2	Intra-Operative Zonular Dialysis (More than 4clock Hours)	4	2
3	Posterior Capsular Rent	5	4

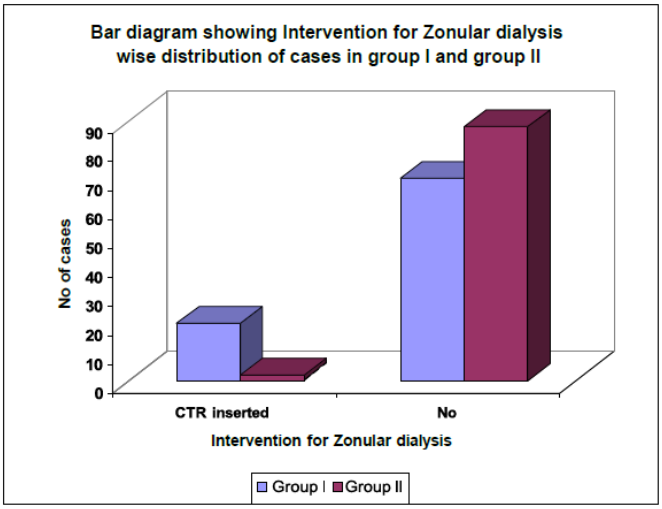
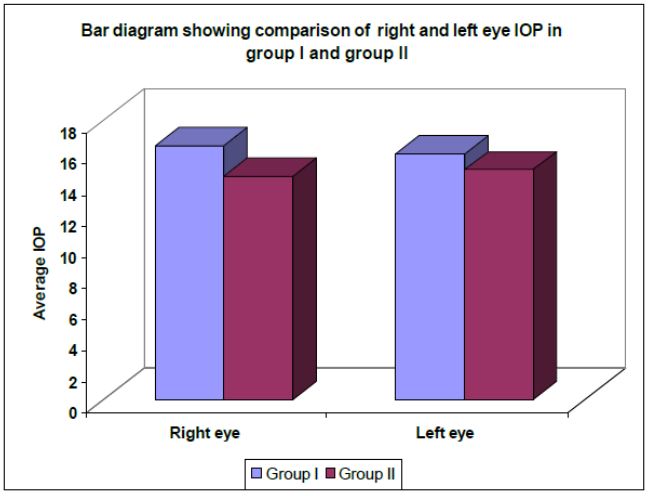


Table 7: Comparison of right and left eye IOP in group I and group II.

Sr. No	IOP (mmHg)	Group I (n=90)		Group II (n=90)		Z Value	P Value
		Mean	SD	Mean	SD		
1	Right eye	16.35	4.33	14.37	3.36	3.44	<0.001
2	Left eye	15.84	3.57	14.82	3.03	2.06	<0.05

This Mean Age was analyzed quantitatively within groups as shown in above table. The Z value was 3.44 and 2.06 for right and left eye repsectively, which was statisticallysignificant(P<0.001) and (P<0.05).



CONCLUSION

1. Small incision cataract surgery was more preferred operative method for senile cataract with pseudoexfoliation syndrome as compared to phacoemulsification in the study group.
2. Zonular dialysis was noted more commonly in senile cataract with pseudoexfoliation syndrome was managed with CTR ring insertion.
3. CTR was used for zonular dialysis less than 4 clock hours.
4. Iris hooks and mechanical dilation were intervention for small pupil and mid-dilating pupil among senile cataract cases with pseudoexfoliation syndrome.
5. Incidence of glaucoma was more in patients with pseudoexfoliation syndrome.
6. Rate of Pre operative and Intra operative complications is more in pseudoexfoliation syndrome patients but can be reduced with proper

preoperative evaluation and intraoperative interventions.

7. Meticulous preoperative evaluation, well planned surgical approach and standby interventionsl devices like iris hooks, CTR, Vitrectomy cutter, iris claw lenses will provide excellent surgical outcome.

ACKNOWLEDGEMENT: NONE.

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