

Study of intraoperative and postoperative complications and visual outcome of SICS (Small Incision Cataract Surgery) in patients with pseudoexfoliation syndrome

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Abstract

Aim: To study intraoperative and postoperative complications and analyse visual outcomes in patients with pseudoexfoliation syndrome undergoing SICS. **Settings and Design:** Hospital based prospective interventional study in a tertiary care hospital. **Methods and materials:** A prospective interventional study was carried out on 60 patients with cataract and pseudoexfoliation who underwent SICS in a tertiary care hospital and patients were followed up for 6 months and final visual outcome analysed. **Results:** Mean age at which patients were operated was 70 years. 43.33% of patients were male and 56.67% were females. 44 (73.33%) patients had inadequate pupillary dilatation (≤ 6 mm). Intraoperatively, difficulty in capsulorhexis occurred in 26 (43.33%) patients, zonular dialysis was seen in 8 (13.33%) patients, 2 (3.33%) patients had posterior capsular rent with vitreous loss in whom anterior vitrectomy was done and SFIOL was implanted after 2 months. Early Postoperative complications were corneal edema in 26.66%, retained cortical matter in the bag in 10%, iritis in 10% and elevated IOP in 3.33%. Late postoperative complications at 6 months were IOL decentration in 3.33% and posterior capsular opacification in 3.33%. Final BCVA at 6 months was 6/6-6/12 in 58 (96.67%) patients and 6/18-6/36 in 2 (3.33%) patients. **Conclusion:** SICS in patients with PXF is associated with vision threatening complications which can be reduced by thorough preoperative evaluation, and with appropriate intraoperative measures, good visual outcome can be achieved.

Keywords: pseudoexfoliation, complications

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Introduction

Pseudoexfoliation syndrome is an age related systemic microfibril-
lopathy that involves eyes through gradual deposition of abnormal
fibrillar extracellular material in ocular tissues[3].

Pseudoexfoliative material was also found in skin and visceral organs
like heart, lungs, liver, kidney, gallbladder, blood vessels leading to
the concept that pseudoexfoliation syndrome is the ocular
manifestation of a systemic disorder.

It is highly prevalent in eyes with cataract. The worldwide prevalence
of pseudoexfoliation ranges from 0.5% in those aged less than 60
years to 15% in those aged 60 years or more[1]. The prevalence of
pseudoexfoliation based on hospital reports from India varies between
1.87% to 13.5%[2].

The pseudoexfoliative deposits in eye are produced by abnormal
basement membranes of aging epithelial cells of trabecular
meshwork, pre-equatorial lens capsule, pupillary margin of iris and
ciliary body of the eye[4].

The pseudoexfoliative material is also deposited on corneal
endothelium, trabecular meshwork, angle structures, iris, pupillary
margins, ciliary processes, zonules, anterior lens capsule, anterior
hyaloid phase. Pseudoexfoliation syndrome is associated with an
increased incidence of nuclear cataract[5] which appears earlier and
progresses faster in these patients[3]. Pseudoexfoliative deposits on
iris (iridopathy), lens (phacopathy) and zonules (zonulopathy) result
in poor pupillary dilatation, zonular weakness resulting in
phacodonesis (lens instability) making cataract surgery a challenging
task and can cause many surgical complications intraoperatively as
well as postoperatively which can affect the visual outcome adversely.
Pseudoexfoliation is associated with decreased corneal endothelial
cell count which can lead to early corneal decompensation after
cataract surgery[6]. All these difficulties posed by pseudoexfoliation
syndrome make its diagnosis very important. Otherwise, it may go
unnoticed and result in unexpected complications.

With careful examination, diagnosis of pseudoexfoliation is possible
and appropriate intraoperative techniques can be planned which may
need additional modalities like iris hooks, capsular tension rings, iris
clips or scleral fixated IOLs that can be kept ready to reduce the
complications during SICS to achieve good visual outcomes. So, in
this study we have assessed intraoperative and postoperative
complications in patients with pseudoexfoliation syndrome
undergoing SICS and the final visual outcome in these patients.

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Materials and methods

Hospital based prospective interventional study was conducted in the Department of Ophthalmology at a tertiary care centre from September 2018 to December 2020.

Inclusion criteria

All patients of cataract with pseudoexfoliation syndrome who presented to Out Patient Department of Ophthalmology.

Exclusion criteria

1. Established cases of glaucoma.
2. Patients with previous intraocular surgeries.
3. Patients with previous intraocular trauma.
4. Patients with intraocular inflammation.
6. Patients with posterior segment pathology.
7. Patients with high myopia.
8. Patients with history of miotic use.
9. Patients with diabetes mellitus.
10. Patients not willing for participating in the study.

Methodology

Patients were admitted 1 day prior to the surgery. Written consent was taken after fully explaining the procedure. Detailed history was taken. Thorough ocular examination was done which included Best Corrected Visual Acuity measurement using Snellen's visual acuity chart, intraocular pressure measurement by Goldmann applanation tonometer, gonioscopy, detailed slit lamp evaluation before and after pupillary dilatation to look for pseudoexfoliative deposits, measurement of pupillary size before and after dilatation. Any pupillary dilatation < 5mm was considered to be poor pupillary dilatation, 5-6mm to be fair pupillary dilatation and > 6 mm to be good pupillary dilatation. Nuclear sclerosis was graded based on the Lens Opacity Classification System-III. Keratometry and A-scan were done. IOL power was calculated using SRK-II formula. Conjunctival swab for culture and sensitivity was taken. Operative fitness of each patient was obtained from the physician.

All surgeries were performed by a single surgeon under strict aseptic precautions. Universal eye speculum was applied. Superior rectus bridle suture was applied to fix the eye in down gaze. A fornix based conjunctival flap was made and underlying Tenon's capsule was separated. A 5-6 mm self-sealing partial thickness scleral incision made 1.5 mm from limbus in superior quadrant and sclero-corneal tunnel was created extending 2 mm into cornea. A side port entry was created at limbus 90 degree away from the tunnel. After staining the anterior capsule with trypan blue dye, capsulorhexis was done. Anterior chamber was filled with 2% Hydroxypropyl Methylcellulose. If the pupil was not dilated adequately, intracameral epinephrine or/and iris hooks were used depending on the need of surgery and decision of operating surgeon. Iris hooks and intracameral epinephrine were used to achieve adequate pupillary dilatation as required. Modifications were made as per requirements. Entry into anterior chamber was made using 2.8 mm keratome and the tunnel was extended. With careful hydrodissection lens cortex was

separated from posterior capsule. In cases of zonular dialysis, decision of Capsular Tension Ring implantation was made as per the need of procedure. Nucleus was prolapsed into Anterior Chamber and was delivered with the help of viscoexpression. Thorough cortical clean-up was done by careful irrigation and aspiration. The integrity of the capsular bag was assessed and PCIOL was placed in the bag. Subconjunctival injection Gentamycin & Dexamethasone was given. Pad was applied after putting antibiotic-steroid eye ointment. Patients were followed up at postoperative day 1, day 7, 2 months and 6 months.

Results

Out of 60 patients included in study, all patients were > 51 years old and mean age of patients was 70 years. 34 (56.67 %) were females and 26 (43.33%) were males. Distribution of pseudoexfoliation was bilateral in 38 (63.33%) patients and unilateral in 22 (36.67%) patients.

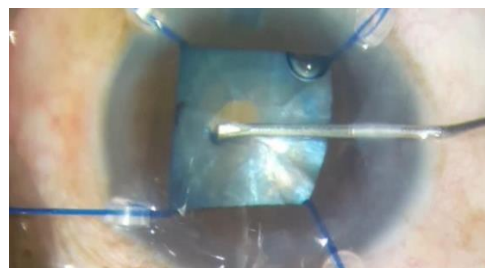
20 (33.33 %) patients had pseudoexfoliative deposits on pupillary margin and lens capsule, 18 (30%) had pseudoexfoliative deposits on iris, pupillary margin and lens capsule, 12 (20%) had deposits on anterior lens capsule and 10 (16.67%) patients had pseudoexfoliative deposits on pupillary margin only.

Inadequate (≤ 6 mm) pupillary dilatation was seen in total 44 (73.33%) patients, out of which 8 (13.33%) had poor (< 5mm) pupillary dilatation, 36 (60%) had fair pupillary dilatation (5mm-6mm). 16 (26.67%) patients had good pupillary dilatation > 6mm.

Preoperatively, we found phacodonesis and zonular dialysis in 6 (10%), iridodonesis in 4 (6.66%), iris atrophy in 10 (16.66%), increased trabecular meshwork pigmentation in 44 (73.33%), pseudoexfoliation deposits in trabecular meshwork in 12 (20%) patients. In our study, intraoperative complications were seen in total 26 (43.33%) patients which include difficulty in capsulorhexis in 26 (43.33%), zonular dialysis in 8 (13.33%), posterior capsular rent with vitreous loss and aphakia in 2 (3.33%) patients. All of the intraoperative complications were found in patients with inadequate pupillary dilatation.

To achieve adequate pupillary dilatation initial viscomydriasis was tried in all 44 cases with inadequate dilatation. Intracameral epinephrine was used in 20 (55.5%), iris hooks were used in 4 (9.1%), both intracameral epinephrine and iris hooks were used in 6 (13.6%) and no intervention other than routine viscomydriasis was required 14 (31.8%) cases. 8 patients with zonular dialysis were implanted with CTR (13.33%). 2 (3.33%) patients with PCR and vitreous loss underwent anterior vitrectomy and was left aphakic in primary setting who was implanted with SFIOL after 2 months.

Early postoperative complications on POD1 were corneal edema, retained cortical matter, iritis and elevated IOP in 16 (26.6%), 6 (10%), 6 (10%), 2 (3.33%) patients respectively. Late postoperative complications at 6 months were decentred IOL in 2 (3.33%) and posterior capsular opacification in 2 (3.33%) patient who underwent Nd:YAG laser capsulotomy. On POD 1 V/A of 6/6-6/12 was achieved in 44 (73.33%), 6/18-6/36 in 6 (10%) and 6/60-CFCF in 10 (16.67%) cases. Final BCVA at 6 months was 6/6-6/12 in 58 (96.67%) patients, 6/18-6/36 in 2 (3.33%) cases.



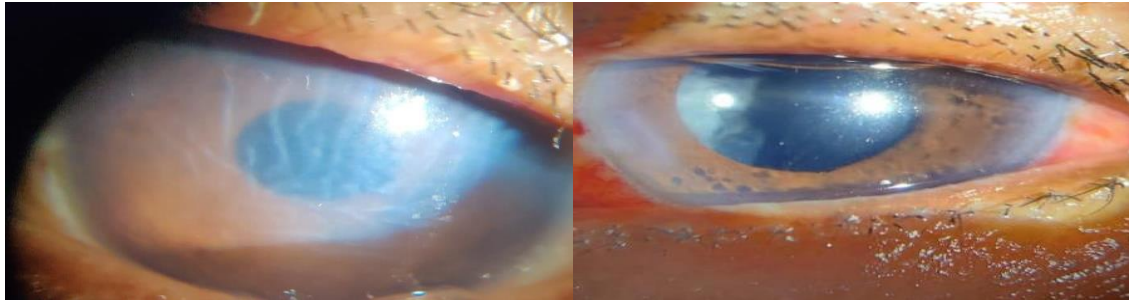


Fig 1: Images of patient's eyes

Table 1: Frequency of intraoperative complications in study subjects

Sr. No.	Intraoperative complication	Number of subjects	Percentage (%)
1.	Difficult capsulorhexis	26	43.33
2.	Zonular dialysis	8	13.33
3.	PCR with vitreous loss	2	3.33
4.	Aphakia	2	3.33

Table 2: Correlation of Intraoperative complications with Pupillary dilatation

Intraoperative complications		Pupillary diameter		Total
		Inadequate ($\leq 6\text{mm}$)	Adequate ($>6\text{mm}$)	
		44	16	60
Difficulty in capsulorhexis		26(59.1%)	0	26(43.33%)
Zonular dialysis	Pre-existing	6	0	8(13.33%)
	Intraoperative	2		
PCR with vitreous loss		2(4.54%)	0	2(3.33%)
Aphakia		2(4.54%)	0	2(3.33%)

Table 3 Frequency of patients requiring interventions for inadequate mydriasis

Inadequate pupillary dilatation ($\leq 6\text{mm}$)	Frequency	Intervention for inadequate pupillary dilatation			
		Viscomydriasis + Intracameral epinephrine	Viscomydriasis + Iris hooks	Viscomydriasis + Intracameral epinephrine + Iris hooks	Viscomydriasis only
< 5mm (Poor)	8	0	4 (50%)	4 (50%)	0
5-6mm (Fair)	36	20 (55.5%)	0	2 (5.6%)	14 (38.9%)
Total	44	20 (45.5%)	4 (9.1%)	6 (13.6%)	14 (31.8%)

Table 4: Frequency of postoperative complications in study subjects on postoperative day 1, postoperative day 7, at 2 months and at 6 months.

Sr. No.	Postoperative complications		POD 1	POD 7	At 2 months	At 6 months	Overall Complications
1	Early complications	Corneal edema	16 (26.6%)	4 (6.66%)	-	-	8 (13.3%)
2		Retained cortical matter	6 (10%)	6 (10%)	-	-	6 (10%)
3		Iritis	6 (10%)	-	-	-	6 (10%)
4		Elevated IOP	2 (3.33%)	-	-	-	2 (3.33%)
5	Late complications	IOL decentration	-	-	-	2(3.33%)	2 (3.33%)
6		PCO	-	-	-	2 (3.33%)	2 (3.33%)

Discussion

Pseudoexfoliation syndrome is an age-related disorder and its prevalence further increases with age. In our study, 90% patients were above 60 years of age. Average age of presentation is 70 years. A study by Nagrale et al.[7] also reported the average age to be 65 ± 9 years. This study had 56.67% (34) females and 43.33% (26) males. Female to male ratio was found to be 1.31:1. Female preponderance was also found in other studies like Nagrale et al.[7], A. K. Joshi et al.[8], A. N. Pandey et al.[9].

Present study found bilateral pseudoexfoliation in 63.33% (38) patients while unilaterality in 36.67% (22). Study by Nagrale et al.[7] also reported bilateral pseudoexfoliation in 70 % and unilateral in 30%. An ultra-structural study by Naumann et al.[10] on the contralateral eye of donor eyes with unilateral pseudoexfoliation found that it was a bilateral disease with asymmetrical involvement and unilateral occurrence was a precursor for the bilateral presentation.

In our study, 44 (73.33%) patients had inadequate pupillary dilatation, out of which 8 (13.33%) had poor ($< 5\text{mm}$) pupillary dilatation, 36 (60%) had fair pupillary dilatation (5mm-6mm). 16 (26.67%) patients had good pupillary dilatation $> 6\text{mm}$. A. N. Pandey et al.[9] in their study reported inadequate pupillary dilatation in 75%.

Pseudoexfoliation material over pupillary margin and the iris surface decreases stromal elasticity due to degenerative changes of sphincter and dilator muscle tissue which account for insufficient mydriasis.

On preoperative evaluation our study reported phacodonesis and zonular dialysis in 6 (10%), iridodonesis in 4 (6.66%), iris atrophy in 10 (16.66%), increased trabecular meshwork pigmentation in 44 (73.33%) and pseudoexfoliation deposits in trabecular meshwork in 12 (20%) patients. A study by Anuradha et al.[11], 10% had iris atrophy, 3.33% had iridodonesis, 10% of patients had phacodonesis, 100% patients had trabecular meshwork pigmentation and 23.33% had pseudoexfoliation material in the angle. Similarly, Alfaite et al.[12] in their study found zonular dialysis to be more common in eyes with pseudoexfoliation. The iris changes were attributed to vascular compromise of iris, pigment loss from the iris stroma. Zonular weakness is caused by deposition of pseudoexfoliative material on zonular fibres and ciliary processes resulting in proteolytic disintegration of the zonules that can cause zonular instability and phacodonesis. Poor pupillary dilatation, phacodonesis and zonular dialysis were considered to be the most important risk factors leading to intraoperative complications. In our study, intraoperative complications were seen in total 26 (43.33%) patients which include difficulty in capsulorhexis in 26 (43.33%), zonular dialysis in 8 (13.33%), posterior capsular rent with vitreous loss and aphakia in 2 (3.33%) patients. All of the intraoperative complications were found in patients with inadequate pupillary dilatation. On comparing the size of pupillary diameter with intra-operative complications a significant correlation ($P = 0.0041$) was obtained. The occurrence of intraoperative complications in our study was comparable with other studies like Anuradha et al.[11], Hegde et al.[13], Sahastrabudhe et al.[14], Hemalatha et al.[15], A. K. Joshi et al.[8]. In 8 cases with very thin capsule and large nucleus, extension of rhexis was encountered. In these cases, CCC was converted into can-opener technique. In 8 cases, difficulty in capsulorhexis was due to phacodonesis and zonular laxity. In 4 cases, anterior capsular tear had occurred. In these cases, capsular opening was completed using Vannas scissor. In 6 cases of hypermature cataract with thin calcified capsule and shrunken nucleus, capsular opening was completed using Vannas scissor. Total 13.33% (8) patients had zonular dialysis, out of which 6 cases had preoperative zonular dialysis and in 2 (3.33%) cases, zonular dialysis was noticed intraoperatively after nucleus delivery. In all of the 8 cases, zonular dialysis was less than 4 clock hours and were implanted with Capsular Tension Ring. In 6 cases, Capsular Tension Ring was implanted immediately after hydrodissection and in 2 cases with intraoperative zonular dialysis, Capsular Tension Ring was implanted immediately after nucleus delivery as soon as the zonular dialysis was noted. None of the patients had complete capsular bag removal instance.

96.67% (58) patients were implanted with PCIOL. In 3.33% (2) patients with posterior capsular rent and vitreous loss, anterior vitrectomy was performed and were left aphakic in the primary setting. These patients were posted for secondary scleral fixated IOL after 2 months.

Early postoperative complications on POD1 were corneal edema, retained cortical matter, iritis and elevated IOP in 16 (26.6%), 6 (10%), 6 (10%), 2 (3.33%) patients respectively.

On POD7, 16 patients who had corneal edema on POD1, resolution of corneal edema was seen in 12 patients while 4 (6.66%) patients still had corneal edema. 6 (10%) patients had retained cortical matter in the bag. Iritis had resolved in all 6 cases. In 2 patients who had elevated IOP on postoperative day 1, control of IOP was achieved with topical antiglaucoma drugs and oral acetazolamide.

At the end of 6 months, 3.33% (2) patients had decentration of IOL and 3.33% (2) had development of posterior capsular opacification. Patients with PCO underwent Nd-YAG laser capsulotomy.

In a study by K. Pranathi et al.[16], corneal edema, anterior chamber reaction, residual lens matter and IOL decentration was seen in 23%, 11.5%, 11.5% and 5.8% patients respectively.

Studies by Hegde et al.[13], K. Satish et al.[17], Hemalatha et al.[15], Bangal et al.[18] also reported comparable results.

It is noteworthy that the pseudoexfoliative process continues even after the surgery, thus the patient should be monitored for possibility of development of glaucoma, capsular phimosis syndrome or decentration of IOL. There is also a risk of future IOL-CTR capsule complex dislocation requiring surgical intervention. Increased occurrence of posterior capsular opacification in eyes with pseudoexfoliation is most probably due to an aggravated blood – aqueous barrier breakdown. On POD 1, 44 (73.33%) patients achieved V/A of 6/6-6/12 while 6 (10%) patients had V/A between 6/18-6/36 and 10 (16.67%) cases had V/A between 6/60-CFCF. Out of 10 patients who had V/A $\leq 6/60$, 6 patients had corneal edema, 2 patients had corneal edema with iritis and 2 patients had aphakia in addition to corneal edema and iritis. Out of 6 patients with V/A between 6/18-6/36, 4 patients had corneal edema and 2 had iritis in addition to corneal edema. At 6 months postoperatively, 2 patient who had underwent secondary SFIOL implantation at the end of 2 months had BCVA between 6/6-6/12. 3.33% (2) patients with > 2 Snellen's lines decline in V/A as compared to 2 months follow up due to development of PCO were treated with Nd-YAG laser capsulotomy and achieved a final BCVA between 6/6-6/12. While 2 patients had decline in V/A to 6/36 from 2 months follow up due to lenticular astigmatism induced by decentration of IOL. Thus, at the end of 6 months, 96.67% (58) patients had BCVA in the range of 6/6-6/12. 3.33% (2) patients had BCVA between 6/18-6/36 due to decentration of IOL.

Good postoperative visual outcomes were also found in studies by A. K. Joshi et al.[8], C. N. Gupta et al.[19], Satish et al.[17], Borre et al.[20]

Conclusion

Inadequate mydriasis, one of the important findings in eyes with pseudoexfoliation syndrome, poses many difficulties to the operating surgeon that can lead to intraoperative complications like Posterior Capsular Rent and vitreous loss. Surgical modifications such as use of iris hooks, intracameral epinephrine to achieve adequate pupillary diameter can reduce the intraoperative complications. Although Cataract surgery in pseudoexfoliation syndrome is challenging, with meticulous attention to the surgical technique during Small Incision Cataract Surgery, the intraoperative complications can be managed well and good visual outcome can be expected with less postoperative complications.

Abbreviations

PXF/PEX – Pseudoexfoliation
SICS - Small Incision Cataract Surgery
BCVA - Best Corrected Visual Acuity
V/A - Visual Acuity
IOP - Intraocular Pressure
IOL - Intraocular Lens

PCIOL - Posterior Chamber Intraocular Lens
 SFIOL - Scleral Fixated Intraocular Lens
 POD - Post Operative Day
 CTR - Capsular Tension Ring
 CCC - Continuous Curvilinear Capsulorhexis
 PCR - Posterior Capsular Rent
 PCO - Posterior Capsular Opacification
 Nd-YAG - Neodymium doped Yttrium Aluminium Garnett
 Sr.No. - Serial Number
 CFCF - Counting Finger Close to Face

References

- Schumacher S, Schrehardt U, Martus P, Lang W, Naumann G O H. Pseudoexfoliation syndrome and aneurysms of the abdominal aorta. *Lancet*. 2001;357:359–360. [CrossRef] [PubMed]
- Thomas R, Paul P, Muliylil J. Glaucoma care update: glaucoma in India. *J Glaucoma*. 2003;12:81–87. [CrossRef] [PubMed]
- Dr. B. Ramalakshmi, Dr. G. Ramachandraiah, Dr. B. Sidda Naik, Dr. Swathi Padma. A Clinical Study of Complications and Visual Outcome of Cataract Surgery in Patients with Pseudoexfoliation (IOSR-JDMS), 2018;17(3): 54-58.
- Streeten BW, Li ZY, Wallace RN, Eagle RC Jr, Keshgegian AA. Pseudoexfoliative fibrilopathy in visceral organs of a patient with pseudoexfoliation syndrome. *Arch Ophthalmol* 1992; 110:1757-62.
- Seland J H, Chylack L T. Jr. Cataracts in exfoliation syndrome. *Trans Ophthalmol Soc UK*. 1982; 102 pt3:375-379.
- Miyake K, Matsuda M, Inaba M. Corneal endothelial changes in exfoliation syndrome. *Am J Ophthalmol*. 1989; 108(1):49-52.
- Prachee H. Nagrale, Vijaykumar Kesharaju, Nanda Nandan, Kavya Reddy. A Study of Eyes with Pseudoexfoliation, its Association with Cataract and its Implications in Cataract Surgery. *International Journal of Contemporary Medical Research* 2018;5(9):11-15.
- Ajit K. Joshi, Rasika D. Konduskar, Krishangee Kalita: Study of Patients with Pseudoexfoliation Syndrome Undergoing Manual Small Incision Cataract Surgery in a Teaching Hospital: Delhi *Journal of Ophthalmology*, 2020:3
- Achyut N. Pandey et al., long term study of cataract surgery and complications in patients with pseudoexfoliation syndrome in Garhwal Himalayan Region. *Ophthalmology Research: An International Journal* 2020;12(3):9
- Hammer T, Schlötzer-Schrehardt U, Naumann G O. Unilateral or asymmetric pseudoexfoliation syndrome? An ultrastructural study. *Arch Ophthalmol*. 2001 Jul;119(7):1023-31.
- Anuradha A, Samhitha H. R, Shilpa Y. D. Study of intraoperative complications of manual small incision cataract surgery in eyes with pseudoexfoliation. *Journal of Evidence Based Medicine and Healthcare* 2015;2 (13): 2044-2050.
- Alfaite M, Leite E, Mira J, Cunha-Vaz JG. Prevalence and surgical complications of pseudoexfoliation syndrome in Portuguese patients with senile cataract. *J Cataract Refract Surg* 1996;22:972-6.
- Shruti Prabhat Hegde, Vijay Kautilya Dayanidhi, Ravi. Study of Prognostic Indicators in Patients with Pseudoexfoliation Syndrome Undergoing Cataract Surgery. *International Journal of Anatomy, Radiology and Surgery*, 2016:1
- V.M. Sahastrabudhe, Study of different intraoperative and postoperative complications during cataract surgery in eyes with pseudoexfoliation. *Int J Res Health Sci* 2018; 6(4): 16-21.
- BC. Hemalatha, Sathyendranath B Shetty. Analysis of Intraoperative and Postoperative Complications in Pseudoexfoliation Eyes Undergoing Cataract Surgery. *Journal of Clinical and Diagnostic Research*. 2016;10(4): NC05-NC08.
- K. Pranathi, Renu M. Magdum, Rupali Maheshgauri, Khevena Patel, S. Patra A study of complications during cataract surgery in patients with pseudoexfoliation syndrome *Journal of Clinical Ophthalmology and Research* – 2014;2(1):7-11
- K. Satish, Ambika Acharya, Raheela Afshan, Serine Johnson, Amudha A, Aylette D'silva. "Management of Intraoperative Complications and Visual Outcome in Patients having Cataract with Pseudoexfoliation Syndrome". *Journal of Evolution of Medical and Dental Sciences* 2014; 3(38): 9829-9836,
- Bangal S, Bhandari A, Gogri P. Outcome of Cataract Surgery in Patients with Pseudoexfoliation. *DJO* 2013;23:183-186.
- C. N. Gupta, Prabhu Chitanya Pottur, Spoorthi. Clinical Profile Of Pseudoexfoliation In Cataract Surgery-A Cross Sectional Study. *TJPRC: Journal of Ophthalmic Surgery and Ocular Pharmacology (TJPRC: JOSOP)* .2015;1(1):1-10
- Borise MA and Balwir D. Pseudoexfoliation Syndrome: Clinical Profile and Visual Outcome after Manual Small Incision Cataract Surgery. *MVP J. Med. Sci.* 2019; 6(2): 195-201.

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