Research Article :

PSEUDOEXFOLIATION - A DREADED NIGHTMARE IN CATARACT SURGERY

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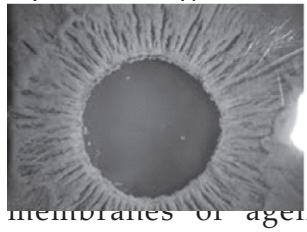
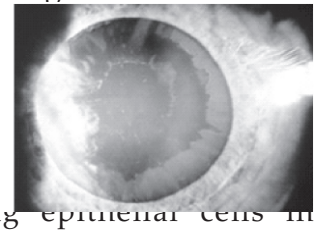
Aim:- Pseudoexfoliation (PXE) is a common and clinically important systemic condition in elderly people that affects the outcome of cataract surgery. It can cause various complications during cataract surgery due to pupillary rigidity and zonular weakness and instability. The purpose of this study was to evaluate the frequency and types of complications of Phacoemulsification in patients with cataract and PXE.

Materials and Methods : This cross sectional, prospective study was carried out on 60 eyes of 60 patients with cataract and PXE who underwent phacoemulsification in a tertiary care hospital. Their perioperative and post-operative complications were documented and analyzed. **Results:-** Poor pupillary dilatation in spite of use of standard mydriatic drops and NSAID was the most common perioperative finding. This single factor made subsequent steps of surgery more difficult due to poor visualisation. **Conclusion:-** Presence of associated PXE in cataract patients significantly increases the risk of vision threatening complications. Use of flexible iris hooks for small pupils, capsular tension rings for capsular stability and high viscosity viscoelastics are useful adjunct during surgical technique for good visual outcome.

Key words : Miosis, Pseudoexfoliation, Zonular weakness, Pseudoexfoliation

was first described by Lindberg in 1917. [1] who said this material was created by earlier inflammation. It was also described by Swiss Ophthalmologist Alfred Vogt in 1918[1] who said





membranes of ageing epithelial cells in trabeculum, equatorial lens capsule, pupillary margin of iris and ciliary body of the eye.[3]

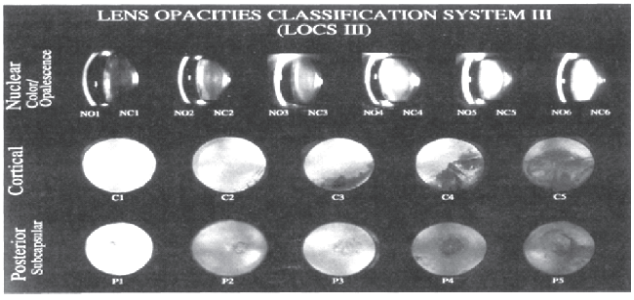
A study carried out in South India reported prevalence of PXE as 3.8%, while the Andhra Pradesh Eye Disease Study reported it as 3.01%.[4,5] PXE induced iridopathy and phacopathy with zonular instability make routine cataract surgery a challenging task. Scorolli et al[6]. found that such patients have 5 times greater risk of intraoperative complications in cataract surgery compared with normal cases. Recognition of this condition is very important before starting surgery on such patients.

The study was done with the aim of evaluating the intra operative and post operative complications of Phacoemulsification in patients with PXE and to suggest measures to minimize the likelihood of such complications.

MATERIALS AND METHOD

This is a prospective, non randomised, case series study which was conducted in Kar Vision Eye Hospital, from 1st August 2013 to 30th May 2014. All patients having cataract with PXE who underwent Phacoemulsification and completed 6 weeks follow up were included in

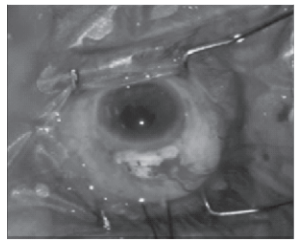
this study. And patients with Glaucoma with a history of miotic use, traumatic cataract, complicated cataract, high myopia and previous

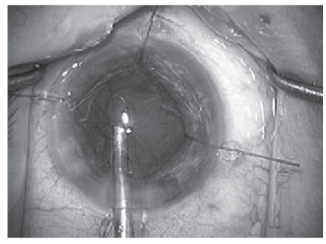


ocular surgery were excluded from the study. A written and informed consent was obtained from all patients after explaining the condition , procedure and associated risk. All patients were evaluated before surgery . A detailed history was taken , BCVA was measured by Snellen's VA chart. Intra Ocular Pressure -measured by Applanation tonometer. Gonioscopy was done to visualize the angle and note the extent of PXF in angle . Detailed slit lamp examination was done and pseudoexfoliative deposits were looked for on the corneal endothelium, iris and pupillary margin and after dilatation, on the anterior capsule of the lens. All patients were operated by the same surgeon by Phacoemulsification. Patients were dilated with mydriatic-cycloplegic drops and NSAIDS were used to maintain dilatation. Pupillary diameter after dilatation was measured and graded as poor (2-4mm), moderate (5-6mm), and good (7-9mm or more)[7] .Cataract was graded according to LOCS III grading system.

PROCEDURE

All patients were operated under topical anaesthesia. Povidone-iodine 5% was instilled into the conjunctival sac 10 min before the surgery Side port entry was made by side port entry blade, trypan blue dye (0.1%) was injected intracamerally to stain the anterior capsule followed by preservative free lignocaine. CCC aimed at 5mm to 5.5mm was done using the needle cystitome in a good dilating pupil. In case of poor and moderately dilating pupil ,it was dilated by mechanical stretching or iris hooks after which CCC was done.



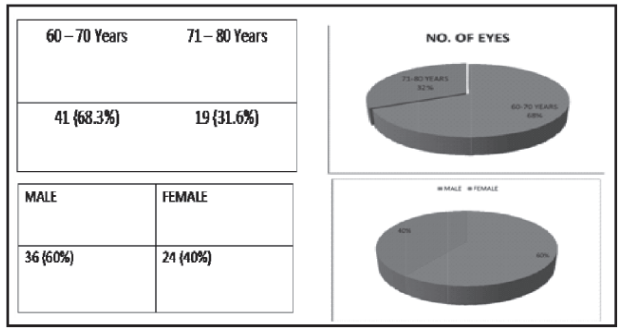


Phacoemulsification was done through clear corneal incision and nucleus was emulsified by stop and chop technique. Post-operatively, patients were put on topical antibiotics for 2 weeks and steroid was tapered over 4-6 weeks depending upon the post-operative inflammation. Patients were followed on the post-op day 1, 14 and at 6 week to evaluate visual acuity, IOP spikes, presence of intraocular inflammation, decentration/tilt of intraocular lens and corneal clarity.

RESULTS

Sixty eyes of 60 patients with PXE who underwent cataract surgery (Phacoemulsification technique) and completed 6 weeks follow up were included in this study to evaluate the perioperative and post-operative complications. All patients irrespective of the pupil size were operated by Phacoemulsification.

2patients originally posted for

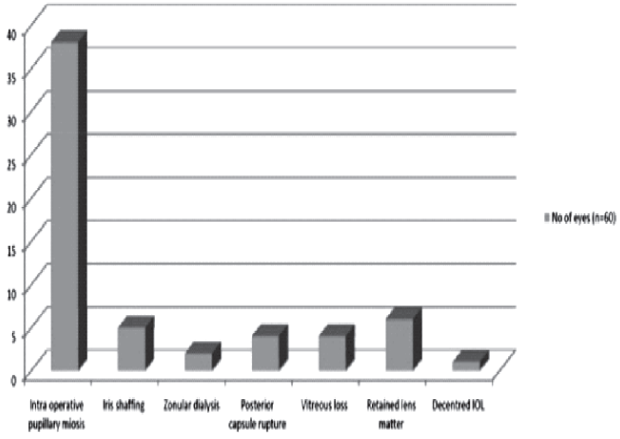


phacoemulsification had to be converted to SICS due to intraoperative difficulties leading to PC rent 13 cases had poor pupillary dilatation.

47 cases had moderate pupil dilatation. None of the pupils dilated beyond 7 mm. Male : Female Ratio :-9:6

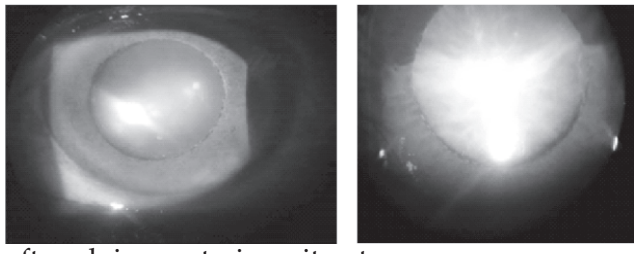
Intra-operative Complication during surgery

SURGICAL COMPLICATIONS	NO OF EYES (n=60)	PERCENTAGE
Intraoperative pupillary miosis	38	63.3%
Iris shaffing	5	8.3
Lens dislocation	0	0
Posterior capsular rupture	4	6.6
Vitreous loss	4	6.6
Retained lens matter	6	10
Decentred IOL	1	1.6
Zonular dialysis	2	3.3



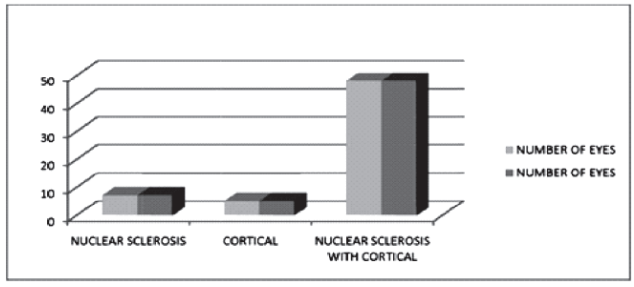
Almost all eyes showed some evidence of pigment dispersion mainly on the anterior surface of the lens and cornea. None of the eyes showed frank subluxation of lens. 32 cases did not require any pupilary dilatation maneuver , 9 cases (15%) required multiple mini sphincterotomies to facilitate capsularhexis , 12 cases (20%) required pupil stretching, 7 cases (11.6%) were done with iris hooks to dilate pupil. 4 eyes (6.6%) had PC rent with vitreous loss due to difficulty in surgical manuever or loose capsular bag. 2 of these cases were converted to SICS and all patients were given sulcus fixated 3 piece foldable PCIOL lenses

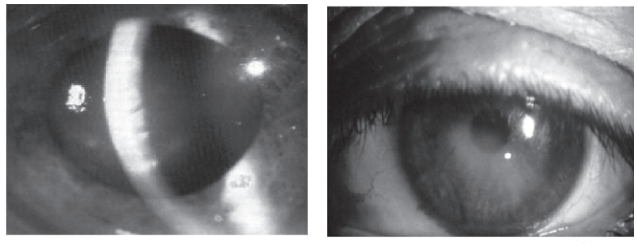
NUCLEAR SCLEROSIS	CORTICAL CATARACT	NUCLEAR SCLEROSIS WITH CORTICAL CATARACT
7 (11.66%)	5 (8.3%)	48 (80%)



after doing anterior vitrectomy.

On Post operative day 1 hazy cornea was seen in 35 (58.3%) cases. 6 cases (10%) had significant intraocular inflammation. IOP was measured both pre and postoperative. Average pre-op IOP was 18.23±2.10. IOP at 14 days post-op was 20±3.15 mmHg.



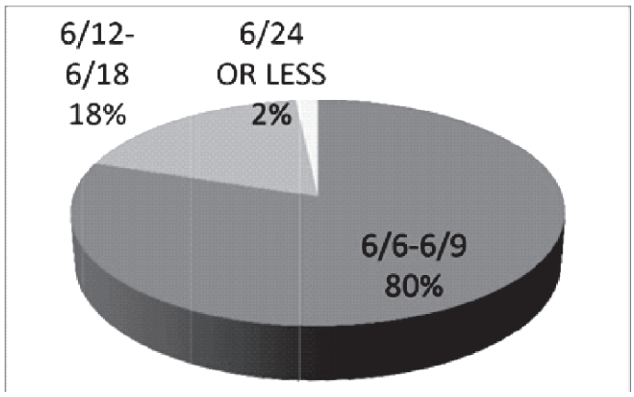


DISCUSSION

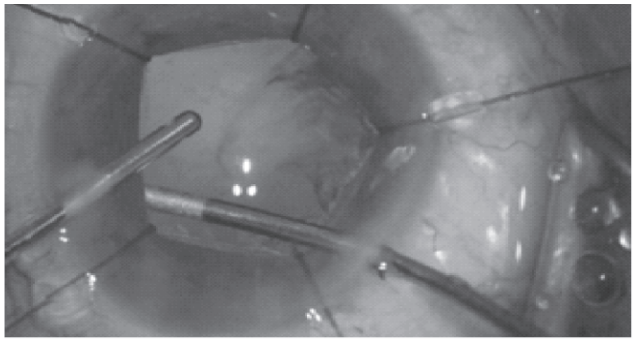
Post Operative Visual Acuity (After 6 weeks of surgery)

Visual acuity	No of eyes (n=60)	Percentage
6/6-6/9	48	80
6/12-6/18	11	18.3
6/24 or less	1	1.7

PXE syndrome affects mainly elderly group of patients who are also likely to undergo cataract surgery. Direct signs of zonule instabilty such as lens subluxation, zonular dialysis, iridodonosis or phacodonosis should be carefully looked for pre-operatively. The earliest sign is a subtle iridodonesis. It is best assessed prior to



the pupillary dilatation where as lens related changes are best seen after dilatation.[8] One study reported that an axial anterior chamber depth of less than 2.5 mm increased risk of surgical complications fivefold.[9] The amount of exfoliative material in the zonules is not predictive of intra-operative zonule weakness.[10]



The ages of patients diagnosed with PXE in this study were 60-80 years age group. Epidemiological studies of PXE have shown that it is more common in patients older than 60 years and prevalence further increases with age.[11,12] Of the 60 patients, 36 (60%) were male and 24 (40%) were female with male:female ratio of 9:6. Reports regarding sex predilection in PXE are conflicting. Some previous studies showed male preponderance while Aravind et al. in 2003 showed no sex predilection.[4] Avramides, Sakkias and Traindis reported a female preponderance.[13]

We have done sphincterotomy, bimanual stretching and used iris hooks for dilatation of pupil Intra operatively. Sphinterotomy and stretching have the disadvantage of causing post-operative distorted and atonic pupil, which may even lead to increase glare. A well centred and adequately sized capsulorhexis is critical in the presence of zonular weakness. Ideal size of a capsulorhexis should be 5.0-5.5 mm in diameter.

Surgeons performing capsulorhexis in PXE may encounter capsule splitting phenomenon in which 2 or multiple layers of split capsule may be raised. The false anterior layer are typically fragile and tear abnormally compared with the underlying true anterior capsule. It is important to identify this phenomenon to allow complete incision of true capsule.

A small capsulorhexis may lead to excessive pull on the zonules, difficulty in extracting nuclear material from capsular bag, increased risk of anterior capsular tear and higher incidence of post operative capsular phimosis. Excessive intra-operative manipulation cause post-operative corneal edema and iritis. In presence of weak zonules, it may lead to severe complications of lens subluxation and vitreous loss.

Other complications, some of which we encountered and which have also been reported in previous studies include iridodialysis, intraocular bleeding, vitreous loss. These are also related to difficult maneuvers due to small rigid pupils and zonular instability. Zonular fragility increases the risk of lens dislocation, zonular dialysis or vitreous loss upto 10 times.[3] Rate of vitreous loss varied from 0% to 11% across different studies.[8,15] Strategies to reduce stress on the zonules include avoidance of excessive fluctuations in the anterior chamber pressure by liberal use of viscoelastics and gentle maneuvers of lens especially gentle hydrodissection to allow unimpeded rotation of the nucleus. In cases with frank zonular weakness, use of a capsular tension ring that distributes forces circumferentially, also reduces post-operative IOLs decentration. Tangential stripping motion in the region of the defect may also reduce extension of the defect. Other studies have reported an increase in posterior

capsular opacification following cataract surgeries in eyes with PXE.[9,12] This may be due to incomplete removal of cortical matter inability to polish the capsule due to loose zonules and poor visibility of peripheral cortex secondary to a small pupil.

In our study only 1 patient had retained cortex which reduced vision. IOL decentration has also been reported even when the lens is entirely in the capsular bag, primarily due to decentration of the entire bag.[19,20] In our series 1 case had decentration due to zonular dialysis where CTR was not put and a 3 piece IOL was put in th bag. This study demonstrated an increased incidence of intra-operative and post-operative complications. A thorough awareness of PXE syndrome and its effects on all ocular tissue is critical to understand the multifactorial causes of operative complication and thereby avoid or minimize them.

PXE presents challenges that must be adequately addressed with proper pre-operative preparation, surgical care and post-operative follow-up.

However, cases may go undetected due to failure to dilate the pupil or to examine the lens with the slit lamp after dilatation. Adequate pre-operative assessment should aim to identify potential problems like the posibility of fragile zonules and difficult visualization due to small pupils. This can help with surgical planning, particularly predicting the possible need for ophthalmic viscosurgical devices, pupil expansion devices and capsule support devices all of which can increase the margin of safety in these potentially complex cases. Appropriate post-operative follow-up is required to monitor and address IOP, capsular contracture and IOLs decentration issues. The main limitations of our study were the small sample size and duration of the study. Futher more,we did not include pre-and post-operative specular microscopy and corneal pachymetry.

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