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Original article:

A Study of complication During Catarct Surgery In Patients With Pseudoexfoliation Syndrome

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Abstract:

Introduction: Pseudoexfoliation (PXE) is an ageing related systemic condition manifesting itself primarily in the eyes. These are the patients who are likely to undergo catract surgery. It can cause pupillary rigidity and Zonular weakness and instability.

Materials and methods: The prospective, non-randomized, case series study was carried out in the eye department of a tertiary hospital from 10th November 2015 to 30th October 2016 patients with cataract associated with PXE were included in this study. All patients with a history of miotic use, traumatic cataract, complicated cataract, high myopia and previous ocular surgery were excluded from the study.

Results: The ages of patients diagnosed with PXE in this study were in 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.(06,07)

Conclusion: 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. .

Introduction:

Pseudoexfoliation (PXE) is an ageing related systemic condition manifesting itself primarily in the eyes. These are the patients who are likely to undergo catract surgery. It can cause pupillary rigidity and Zonular weakness and instability. PXE syndrome affects mainly elderly group of patients who are also likely to undergo cataract surgery. In the present study, 104 patients with PXE were evaluated for perioperative and post-operative complications following SICS and phacoemulsification surgery in a tertiary care center.

PXE is a relatively common finding in elderly patients undergoing cataract surgery, but pre-operative detection may be missed if the eyes are not seen under slit lamp.

The purpose of this study was to study the frequency and types of complications of small incision catract surgery (SICS) types of complications in small incision cataract surgery (SICS) and phacoemulsificationsurgery in patients of cataract with PXE.

Materials and methods:

The prospective, non-randomized, case series study was carried out in the eye department of a tertiary hospital from 10th November 2015 to 30th October 2016 patients with cataract associated with PXE were included in this study.

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All patients with a history of miotic use, traumatic cataract, complicated cataract, high myopia and previous ocular surgery were excluded from the study.

1) All patients were operaed by the same surgeon with more than 5 year experience of small incision cataract surgery (SICS) or phacoemulsification.
2) All patients were put on topical antibiotic drops 1 day prior to surgery.
3) Patients were dilated with mydriatic-cycloplegic drops and non-steroidal anti-inflammatory drops to maintain the dilatation.
4) Pupillary diameter after dilatation was measured and graded as poor (2-4mm), moderate(5-6mm) and good (7-9 mm or more)

PRE-OPERATIVE

- A written and informed consent was obtained from all patients after explaining the procedure and associated risk. Patients were admitted 1 day prior to surgery and detailed history was taken.
- BCVA= snellens visual acuity chart
- IOP=Applanation tonometer
- Gonioscopy = Shaffers system of grading
- SLE = PXE deposits on cornea, Iris, Pupillary Margin, anaterior Lens capsule, zonuyles.
- Catract Grading= using lens opacity classification system.

OPERATIVE

- Peribulbar block with 5 ml of 2% xylocaine and 5 ml of 0.5% bupivacaine with 150 units/ml of hyaluronidase.
- Povidine-iodine 5% was instilled into the conjunctival sac.
- SICS – fornix base conjunctival flap was made, Scleral incision with bard parker knife with 15 no. blade superiorly and sclerocorneal tunnel was constructed with crescent.
- Side port entry was made by side port entry blade
- Trypan blue dye (0.1%) was injected intracamerally to stain the anterior capsule.
- Gentle continous curvilinear capsulorhexis aimed at 6mm to 6.5 mm was done using needle cystitome and completed using Utrata's capsulorhexis forceps.
- Gentle through hydrodissection was performed to separate cortex from nucleus.
- Nucleus was delivered by visco expression.
- Irrigation and aspiration was done with Simcoe's two way irrigation and aspiration cannula.
- Rigid, biconvex, polymethyl metha acrylate posterior chamber intraocular lens (IOLs) with optic diameter of 6mm with dialing holes was used and was implantated in bag using Kelman Mcpherson forceps.
- In patients who were operated by phacoemulsification,clear corneal incision was made and nucleus was emulsified by stop and chop technique. Foldable IOL was used in Pharcoemusification surgery.

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POST-OPERATIVE

1) Patients were put on topical antibiotics+steroid droups.
2) Steroids tapered over 4-6 weeks depending upon the post – operative inflammation.
3) Patients were followed on the post – operative day 1, day 7, and day 14 and at weekly intervals for 3 months to evaluate intraocular pressure spikes, presence of intraocular inflammation, decentration/tilt of intra ocular lens and corneal decompensation.

   Data was entered and analyzed using statistical packeage for social sciences version 15.0 (IBM). Analysis was done for quantitative and qualitative measures.

Results

Surgical complications	No. of eyes (n=104)	Percentage
Poorly dialated pupil	64	61.5
Iridodialysis	02	1.9
Lens Dislocation	00	00
Posterior Capsule rupture	08	7.7
Vitreous loss	08	7.7
Retain Lens matter	12	11.5
Decentered Iol	06	5.8
Zonular dialasis	04	3.8
Post operative hyphema	02	1.9

The ages of patients diagnosed with PXE in this study were in 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.(06,07)

Discussion

PXE syndrome affects mainly elderly group of patients who are also likely to undergo cataract surgery. In the present study, 104 patients with PXE were evaluated for perioperative and post-operative complications following SICS and phacoemulsification surgery in a tertiary care center.

PXE is a relatively common finding in elderly patients undergoing cataract surgery, but pre-operative detection may be missed if the eyes are not seen under slit lamp.

Direct sign of zonule instability such as lens subluxation, zonuylar dialysis, iridodonosis or phacodonosis should be carefully looked for pre-operatively. Often the earliest sign is a subtle iridodonesis or phacodonosis assessed prior to the papillary dilation while lens related changes are best seen after dilatation (03). One study reported that an anterior chamber depth of less than 2.5 mm increased risk of surgical complications five fold.(04) The amount of exfoliative material in the zonuled does not seem to be predictive of intra operative zonule weakness. (05)

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Of the 104 patients, 56 (53.8%) were male and 48 (46.2%) were female with male : female ratio of 7:6 Reports regarding sex predilection in PXE are conflicting. Some previous studies showed male preponderance while Arvind et al. in 2003 showed no sex predilection. (10) Avramides, Sakkias and Traindis reported a female preponderance.(08) External environmental factors have also been implicated for causing PXE.

Total	Male	Female
104	56	48
%	53.8	46.2
Ratio	7	6

Of the 104 Patients studied, 14 (13.5%) had nuclear sclerosis, 10(9.6%) had cortical cataract and both changes were seen in 80 (76.9%)cases. Most studies have found a strong association between PXE and nuclear cataract. (05,09,10)It has been hypothesized that high-levels of epithelial metabolic activity may be beneficial for ion pumps and electrolyte environment of cortical fibers. (09)

Nuclear Sclerosis	14	13.5%
Cortical Cataract	10	9.6%
Both	80	76.9%

In the present study, most frequent problem encountered was a rigid pupil and none of the pupils dilated more than 7 mm in spite of use of standard mydriatic drops. Carpel (11) found a high 94.1% prevalence while, Alfaiate et al. (06) found prevalence of 48.4% Bimanual stretching and use of iris hooks or flexible iris retractors are also possible. A well crentered and adequately sized capsulorhexis is critical in the presence of zonular weakness. Ideal size of a capsularhexis should be 5.0-5.5 mm in diameter. Surgeons performing capsularrhexis in PXE may encounter capsule splitting phenomenon in which multiple layers of split capsule may be raised. The false anterior layers 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 capsulorrhexis 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 introperative manipulations 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, we encountered and also 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 up to 10 times. (1)Rate of vitreous loss varied from 0% to 11% across different studies. (03,10)

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Post-operatively, 36 cases had significant intraocular inflammation ,with corneal decompensation seen in 24 cases. Frequency of retained lens matter especially subincisional cortex can invite severe post-operative inflammation and decentration of IOLs. Such complications can directly affect the visual recovery post-operatively. Hence surgical skill becomes an important factor for good visual outcome in such patients.

Strategies to reduce stress on the zonules include avoidance of excessive fluctuation in anterior chamber pressure by controlled paracentesis and liberal use of viscoelastic and gentle maneuvers of lens especially gentle hydrodissection to allow unimpeded rotation of the nucleus. In cases with frank zonular weakness, use of a capsule 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 surgery in eyes with PXE (04,07) This may be due to incomplete removal of cortical matter due to poor visibility secondary to small pupil. In our study 18.8% of cases had posterior capsular opacification. IOL decentration has also been reported even when the lens is entirely in the capsular bag, primarily due to decentration of entire bag.

PXE presents challenges that must be adequately addressed with proper pre-operative preparation, surgical care and post0-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 possibility 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 the study were the small sample size and duration of the study.

Conclusion:

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. .

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