

# Combined Procedure in Patients with Pseudoexfoliation Syndrome

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**Purpose:** To observe the intraocular pressure and visual acuity before and after the combined procedure with an observation on the intraoperative complications in patients with pseudoexfoliation syndrome who had coexisting cataract and glaucoma.

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**Material and Methods:** The study was conducted in Al- Ibrahim eye hospital, Malir, Karachi from April 2002 to April 2004. Thirty eyes of 28 patients with pseudoexfoliation syndrome have to combined procedure been included in the study. The main observations were preoperative and postoperative visual acuity, intraocular pressure, and intraoperative adverse event rates.

**Results:** A total of 30 eyes with pseudoexfoliation of 28 patients underwent planned combined procedure. Sixteen (53.33%) eyes achieved 6/18 or better vision postoperatively. The mean preoperative intraocular pressure was 25 mm Hg (range, 14 to 38 mm Hg), which decreased to a mean postoperative intraocular pressure of 15.1 mm Hg (range, 8 to 18 mm Hg). Intraoperative complications occurred in 4 (13.33%) eyes.

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**Conclusion:** The combined procedure in pseudoexfoliation syndrome reduces intraocular pressure, improves visual acuity with minimal intraoperative complications.

**P**seudoexfoliation syndrome (PXS) is defined as a discrete clinical entity characterized by synthesis and progressive accumulation of fine white granular material in many ocular tissues. The first description of this condition appeared in

Scandinavian literature in 1917, when Lindbergh described flaky material at the pupillary border in some patients with glaucoma<sup>1</sup>. Throughout the anterior segment including the lens, iris, trabecular structures, conjunctiva, corneal endothelium, ciliary

body, and zonules the pseudoexfoliative material may be detected histopathologically. The deposition of fibrillar eosinophilic material on the anterior lens capsule is the classic histopathologic feature of PXS<sup>2</sup>. Pseudoexfoliative material appears to be a homogeneous, eosinophilic, periodic acid-schiff positive staining substance under light microscopy, which indicates a material rich in polysaccharides<sup>3</sup>. It is now considered the most common identifiable specific entity leading to the development of glaucoma<sup>4</sup>. Eyes with PXS have a greater frequency of complications at the time of cataract extraction, such as zonular dialysis, capsular rupture, and vitreous loss<sup>5</sup>.

In the new millennium of rapid advancements and modifications in all fields of science and technology, the treatment of coexisting cataract and glaucoma by combined procedure (extracapsular cataract extraction with intraocular lens implantation and trabeculectomy) has produced favorable results<sup>6</sup>. Combined procedure not only improves visual acuity (VA) and control of intraocular pressure (IOP), but also improves postoperative pressure spikes. Long term benefits include decrease or no use of antiglaucoma medications, decrease in the progression of visual field loss and less frequent follow up<sup>7</sup>. Recognition that the patient has PXS is of clinical significance, especially because it indicates an unstable IOP that can lead to a serious glaucoma in which the optic nerve may become damaged rapidly and because of abnormalities in the lens capsule and zonules that can lead to phacodonesis and predispose to complications at the time of cataract extraction. Potential causes of elevated IOP in eyes with PXS include blockage of the meshwork by exfoliative material, blockage of the meshwork by liberated iris pigment, trabecular cell dysfunction, and coexisting primary open angle glaucoma. Pupils of eyes with PXS dilate less and have greater incidence of capsular rupture, zonular dehiscence, and vitreous loss. Postoperative complications of posterior capsular opacification, capsule contraction syndrome, intraocular lens decentration, and inflammation are also greater in eyes with PXS<sup>8,9</sup>. Combined procedure can rehabilitate every proven case of glaucoma with a few years history of medication, if a cataract needs to be removed<sup>10</sup>.

The rationale of the study was to observe in our setup the IOP and VA before and after the combined procedure and the intraoperative complications in patients with PXS.

## MATERIAL AND METHODS

This case series of eyes with pseudoexfoliation syndrome, underwent extracapsular cataract extraction with posterior chamber intraocular lens implantation and trabeculectomy, was carried out in Al- Ibrahim eye hospital, Malir, Karachi. The study was carried out between April 2002 and April 2004. Patients having coexisting cataract and glaucoma capsulare were reviewed at outpatients department and admitted for combined procedure. All selected patients were thoroughly evaluated. A detailed history of every patient was taken. Special attention paid to the ocular history. Patients were asked about trauma, inflammation, amblyopia, and retinal disease. Refractive history was taken. Questions were also asked regarding their general health. Family history regarding ocular problems was also inquired. Patients having cataract, which was sufficiently advanced to interfere with the performance of the patient's daily routine, and intraocular pressure is either uncontrolled or poorly controlled (more than 22mm Hg) with maximal tolerated medication with PXS were included in the study. Patients who have had previous filtration surgery, preoperative corneal opacification, complicated and traumatic cataracts, subluxated or dislocated lenses, posterior segment pathology, and/or did not observe a regular follow up were excluded from the study. Standard extracapsular cataract extraction with posterior chamber intraocular lens implantation technique was combined with trabeculectomy. Senior and expert surgeons performed all the surgeries. Consent for surgery was duly obtained from the patient, or close relative of the patient. All the patients were operated upon under local anesthesia. All the data were analyzed using statistical package for social sciences (SPSS) 13.0.

## RESULTS

Thirty eyes of 28 patients underwent combined extracapsular cataract extraction with posterior chamber intraocular lens implantation and trabeculectomy. Out of 28 patients 20 (71.43%) were males and 8 (28.57%) were female. Average age of patient was 65 years, with a range of 55-80 years.

Preoperatively 25 (83.33%) eyes out of 30 had 6/60 or worse vision. Postoperatively 16 (53.33%) eyes had 6/18 or better vision and 12 (40%) eyes had vision between 6/24 and 6/36 (Table 1).

Preoperative intraocular pressure range was between 14-38 mm Hg, with an average of 25 mm Hg. Postoperative intraocular pressure range was between 8-18 mm Hg, with an average of 15.1 mm Hg (Table 2).

Preoperatively all eyes were on antiglaucoma medication, 5 (16.66%) eyes out of 30 eyes were on two antiglaucoma medicine. Postoperatively, 28 (93.33%) eyes needed no antiglaucoma medication, while intraocular pressures of 2 (6.33%) eyes were control on single medicine.

Poor dilation of pupil was recorded in 14 (46.66%) eyes. Intraoperatively 2 (6.66%) eyes had posterior capsular rupture with vitreous loss and 2 (6.66%) eyes had zonular dialysis. Postoperatively, 10 (33.33%) eyes had fibrin exudation. One patient (3.33%) had retained lens matter. Five (16.66%) eyes had shown pigment deposition on IOL. Five (16.66%) eyes developed posterior capsular opacification.

## DISCUSSION

Ophthalmologists have been facing the challenge of simultaneous management of cataract and glaucoma in our elderly population with pseudoexfoliation syndrome. The surgical management of coexisting glaucoma and cataract has changed a lot, raising critical management issues<sup>6,7</sup>. The benefits of combined procedure include, to avoid temporary increase in intraocular pressure in the initial postoperative period which is common after standard extra capsular cataract extraction, achieve long term improvement in IOP control with one surgical procedure while removing the visual impairment, and save the patient one surgery<sup>11</sup>.

The results of this study have been compared with national and international literature. The PXS usually affects the elderly and steady increase in prevalence occurs with advancing age<sup>1</sup>. Our study also supports this, as 71.42% of patients were of age 61 years or more. Although, a 32 years old lady was reported to be the youngest by Khanzada<sup>12</sup>.

Poor pupillary mydriasis, a well-known feature of exfoliation syndrome can seriously hamper the surgeon's view. Poor dilation of pupil was recorded in 14(46.66%) eyes in our study, which was comparable to 47.45% in a local study carried out by Ismail<sup>13</sup>, and 43.7% recorded by Kuchle<sup>14</sup>.

Local production and deposition of pseudoexfoliative material may lead to characteristic clinical and ultrastructural changes, which actively involve all structures of the anterior segment of the eye<sup>1</sup>. These alterations may cause complication after surgical procedures. Many reports have mentioned increased rate of intraoperative complications, that is, zonular dialysis, posterior capsular tear, and vitreous loss

during cataract extraction in eyes with PXS. Intraoperative complication like zonular dialysis (2 eyes-6.66%), posterior capsular tear (2 eyes-6.66%), vitreous loss (2 eyes-6.66%) are comparable to international figures of 4.59% - 14.8%<sup>14,15-17</sup>, 2.29% - 7.6%<sup>14,17</sup>, 4.59% to 5.1%<sup>14,18</sup>, respectively. In zonular dialysis and posterior capsular tear without vitreous loss surgery was concluded favorably with posterior chamber IOL in sulcus. Postoperatively 16(53.33%) eyes had achieved 6/18 or better visual acuity. Twelve (40%) eyes had achieved 6/24 or 6/36 visual acuity. The vision in all eyes was improved except in 1 (3.33%) eye, in which the preoperative and postoperative vision remained as hand motion, because of the glaucomatous optic atrophy. Jacobi had also reported significant improvement in vision after combined procedure in PXS<sup>17</sup>.

Various studies have demonstrated that the clinical course in pseudoexfoliative glaucoma (PXG) is likely to be more serious as compared with primary open angle glaucoma<sup>19,20</sup>. Level of IOP, progression of visual defects, and glaucomatous optic neuropathy are more pronounced in PXG<sup>20</sup>. Moreover, exfoliative eyes respond less readily to medical therapy, so that many of these require early surgery. Jacobi reported that after combined procedure in eyes with pseudoexfoliation syndrome, the mean IOP of 32.5 mm Hg with a mean of 2.1 antiglaucoma medications was decreased to the mean IOP of 18.1 mm Hg with a mean of 0.2 antiglaucoma medications after 6 months<sup>17</sup>. In our study the mean IOP of 25 mm Hg with a mean of 1.16 antiglaucoma medications was decreased to the mean IOP of 15.1 mm Hg with a mean of 0.06 antiglaucoma medications. The intraocular pressure control after combined procedure in PXS was comparatively better in our patients.

A number of studies have presented evidence of dysfunction of the blood aqueous barrier in pseudoexfoliation syndrome, with consecutive increase of aqueous flare and protein. Clinical response of inflammatory reaction and fibrin formation in eyes with pseudoexfoliation following cataract extraction appears to be related to these ultrastructural changes<sup>21,22</sup>. Dorslum compared postoperative complications in 136 eyes with pseudoexfoliation syndrome to 744 eyes without pseudoexfoliation syndrome<sup>23</sup>. He observed the postoperative iritis in 16.2% of eyes with PXS as compared to 3.8% of eyes without PXS. Jacobi reported 38% fibrin exudation in patients of PXS undergone combined procedure<sup>17</sup>,

while in our study it was recorded in 33.33% of eyes which was analogous to other studies.

The incidence of posterior capsular opacification in PXS described by Kuchle was 25% after 6 months<sup>9</sup>. In our study this incidence was 16.66%. However, it is difficult to compare the rates of posterior capsular opacification in various studies because of high variation in follow-up time, definition of posterior capsular opacification, patient age, surgical techniques, and type of intraocular lens.

## CONCLUSION

The observations of this study indicate that the combined procedure for coexisting cataract and glaucoma in patients having pseudoexfoliation syndrome, reduces IOP, improves visual acuity with minimal intraoperative complications. However, our observations are preliminary, and larger clinical trails with long-term follow-up in our setup will be necessary to establish the actual effectiveness and safety of combined procedure in pseudoexfoliation syndrome.

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