Changes in Anterior Segment Configuration After Cataract Surgery in Eyes with Pseudoexfoliation Syndrome and Pseudoexfoliation Glaucoma

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ABSTRACT

Purpose: To compare the changes in anterior segment (AS) configuration after cataract surgery in the eyes with pseudoexfoliation syndrome (PXS), pseudoexfoliation glaucoma (PXG) and normal eyes.

Materials and Methods: This retrospective study included 94 eyes with PXS, 77 eyes with PXG and 109 normal eyes. Anterior chamber depth (ACD), anterior chamber volume (ACV), anterior chamber angle (ACA), central corneal thickness and keratometry values, measured by Scheimpflug imaging before and after surgery at first month and 3rd months, were compared among the three groups. The influence of intraocular pressure (IOP) change on AS was analyzed by correlation analysis.

Results: The ACA and change in ACA were significantly smaller in normals among the three groups ($p<0.0001$) at month 1 and 3. The ACV ($p=0.04$) and enlargement in ACV ($p=0.01$) were significantly greater in the PXS eyes than PXG eyes, at month 3. The only significant correlation between AS and IOP was in the PXG group ($p<0.05$). At month 1, the IOP reduction was correlated with change in ACD ($R=-0.230$) and in ACV ($R=-0.278$), and also IOP was correlated with change in ACA ($R=-0.230$). At month 3, the postoperative IOP was associated with postoperative ACV ($R=-0.240$).

Conclusion: In the PXG group, greater reduction in IOP was correlated with deepening in ACD and ACV and also higher postoperative IOP was correlated with less enlargement in ACA and smaller ACV. The eyes with pseudoexfoliation may be more sensitive to IOP changes following cataract surgery in the presence of glaucoma due to greater zonular instability.

Keywords: Anterior segment, Cataract surgery, Intraocular pressure, Zonular instability.

INTRODUCTION

Pseudoexfoliation (PEX) is an age-related abnormal fibrillopathy that is characterized by the gradual accumulation of grayish-white exfoliation material in the anterior segment (AS) of the eye and the other body tissues.[1] Deposits of material on the anterior lens surface and at the pupillary border are the most important diagnostic features of the pseudoexfoliation syndrome (PXS). The exfoliation may also be found on the corneal endothelium, lens zonules, ciliary body and trabecular meshwork. The association between PEX and zonular weakness, glaucoma, corneal decompensation, poor pupil dilation and breakdown of the blood-aqueous barrier has been reported in the previous studies.[2,3] Infiltration of PEX in the zonular lamella and nonpigmented ciliary epithelium leads to proteolytic degradation of the zonule, resulting in weakening and spontaneous fragmentation of the zonules.[4,5] Impaired zonule function can cause movement of the crystalline lens complex, thus impacting the AS configuration. The shallower anterior segments in eyes with PEX than those without PEX have been demonstrated in the clinical investigations.[6,7]

Pseudoexfoliation has an etiological association with cataract.[8,9] A greater reduction in intraocular pressure (IOP) following cataract surgery has been shown in the eyes with PEX when compared with non-PEX eyes.[10,11]

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The level of positive correlation between preoperative IOP and IOP reduction after cataract surgery, has been found more greater in the PEX eyes with glaucoma than those without glaucoma.[12] Pseudoexfoliation is a progressive zonulopathy and the duration of exfoliation material has been shown to associate with the presence and severity of glaucoma.[13] In the eyes with pseudoexfoliation glaucoma (PXG), due to the long infiltration time of PEX, there may be weaker zonules and more unstable capsule bag than those with PXS.

Although there are many previous studies examining the changes in the AS parameters after cataract surgery in the eyes with PEX, the presence of glaucoma has been excluded in these studies.[14-17] Therefore, in the present study we compared the AS parameters before and after cataract surgery between the eyes with PXS, the eyes with PXG and normal eyes. Also, we analyzed the influence of the IOP change on AS parameters.

MATERIALS AND METHODS

We retrospectively reviewed medical records of 280 eyes of 280 patients with visually disabling cataract who had underwent uncomplicated phacoemulsification surgery and in-the-bag intraocular lens (IOL) implantation**,** at a single center, Istanbul, Turkey, between January 2021 and November 2022. All research and measurements followed the tenets of the Declaration of Helsinki, and the protocol was approved by the ethical committee of the same hospital. The informed consent was waived.

The patients with gonioscopically confirmed open-angle and IOP ≤ 21 mmHg with or without medication, were enrolled. According to their diagnosis, subjects were divided into PXS, PXG, and a normal group. The PXS group included the eyes with obvious evidence of PEX deposits on the AS structures, normal appearance of the optic nerve head without cupping, rim, notching or pallor and normal computerised visual field examination (SITA Standard algorithm, 24-2 test, Humphrey Visual Field Analyzer II; Carl Zeiss Meditec, Jena, Germany). The diagnostic criteria of PXG were visible pseudoexfoliation material, glaucomatous optic nerve head changes, and glaucomatous visual field defects with automated visual field test. The eyes with IOP ≤ 21 mmHg without medication, normal anterior segment and optic nerve head and normal results of visual field test were included in the normal group.

The exclusion criteria included comorbid eye conditions (corneal pathology, maculopathy, uveitis) and systemic medication usage that might effect the visual acuity or AS parameters, a history of trauma, previous ocular surgeries, intraoperative complications (capsule tear, zonular dialysis), postoperative complications (macular oedema, retinal detachment, clinically significant decentered IOL), and combined surgery procedures. We excluded the eyes with dense cataracts or poor fixation requiring ultrasound biometry. The eyes with overt signs of zonular instability such as lens subluxation and phacodonesis were not included as these circumstances may markedly influence the results**.** In patients undergoing bilateral cataract surgery, only the first eye operated on was included in the study.

All surgical procedures were performed by two experienced surgeons (HT, OA), under subtenon anesthesia. All cases underwent a 2.8-mm clear corneal incision in the upper corneal limbus, 5 to 6 mm continuous curvilinear capsulorhexis, hydrodissection, and phacoemulsification with the same machine (Infiniti Vision System, Alcon Laboratories, Fort Worth, TX, USA). A single-piece, foldable, acrylic hydrophobic posterior chamber IOL (Eyecryl Plus ASHFY600; Biotech Vision Care Pvt. Ltd., Ahmedabad, India) was implanted in the capsular bag. At the end of surgery, cefuroxime axetil (1 mg/0.1 mL) was administered into the anterior chamber. The patients were treated with moxifloxacin eye drops 0.5% (Vigamox; Alcon Labs Inc.) and prednisolone acetate ophthalmic suspension 1% (Pred Forte, Allergan, Ireland) 4 times per day during the postoperative first month.

Data collection

The gender, patient age, IOP measured by Goldmann applanation tonometer, corrected-distance visual acuity (CDVA) as the logarithm of the minimum angle of resolution (LogMAR) and axial length (AL) measured using partial coherence interferometry (IOL Master 500; Carl Zeiss Meditec) were recorded. Anterior segment parameters including anterior chamber depth (ACD), anterior chamber volume (ACV), anterior chamber angle (ACA), central corneal thickness (CCT), and flat and steep keratometry (K) were measured automatically by Scheimpflug imaging (Sirius topography, Schwind eye-tech-solutions). The ACD was the distance between the central corneal endothelium and the anterior pole of the lens. The mean K was calculated. The lens thickness (LT) was measured as the distance from the anterior surface to the posterior surface of the crystalline lens.

The Sirius topography device obtains 25 radial sections of the cornea and anterior chamber using a combination of a monochromatic three-dimensional (3D) rotating

Scheimpflug camera and a Placido-disk with 22 rings. Scheimpflug camera provides focused images from the anterior surface of cornea to the posterior lens and transforms these images into a 3D model using their rotating capability.[18] In this study, the Sirius topography was performed on non-dilated pupils in a standard dimly lit room, at the automatic release mode. The measurements of Scheimpflug camera were extracted only when the quality of the measurement was "OK". The mean of three values were used for statistical analysis.

After cataract surgery, the measurements at the postoperative first month and 3rd month including CDVA, IOP, AL and AS parameters were recorded as postoperative outcomes. The changes in these measurements were also calculated by subtracting the postoperative value from the preoperative value.

The primary outcome was to compare the preoperative and postoperative AS measurements and also the changes in AS parameters following cataract surgery between PXS, PXG and normal eyes. The secondary outcome was to determine the effect of IOP change on AS configuration.

Statistical analysis

All statistical analyses were performed using SPSS for Windows (v. 20.0, SPSS Inc.). The variables were investigated using the Kolmogorov-Smirnov test to determine whether they were normally distributed. Among the three groups, the multiple comparisons were performed using the Chi-square test for gender and One-way Anova or Kruskal-Wallis test for continuous variables. The Bonferroni correction was applied. Spearman or Pearson correlation analysis were used to analyze the association between IOP measurements and pre- and postoperative parameters. The values were given as mean±standard deviation (SD) for normally distributed continuous variables, median±interquartile range (IQR) for non-normally distributed continuous variables. A P value <0.05 was considered statistically significant.

RESULTS

Ninety-four eyes with PXS, 77 eyes with PXG and 109 normal eyes were enrolled in this study. The baseline characteristics and preoperative measurements were given in detail in Table 1. There was no statistically significant difference among the three groups in terms of age, gender, preoperative CDVA, preoperative AL and AS parameters. The preoperative IOP was statistically significantly higher in the PXG group than PXS group (p=0.01) and normals (p<0.0001).

The postoperative outcomes at first month were shown in Table 2. The visual acuity was statististically significantly

Table 1: *Baseline characteristics and preoperative measurements*

Parameter	PXS (n=94)	PXG (n=77)	NORMAL (n=109)	P value
Age (years±IQR)	72.0±7.0	72.0±8.0	69.0±7.0	0.05*
Gender (Female / Male)	39/55	30/47	53/56	0.37
CDVA (LogMAR±IQR)	0.61±0.60	0.70±0.90	0.52±0.60	0.72*
IOP (mmHg±IQR)	16.00±4.0	18.00±6.0	15.0±4.0	<0.0001* *(PXG>PXS=NORMAL)*
AL (mm±IQR)	23.43±1.18	23.21±1.26	23.25±1.34	0.60*
Anterior Segment Measurements				
Mean K (Diopter±SD)	43.70 ± 1.59	43.83±1.77	43.47±1.66	0.34**
ACD (mm±SD)	2.59±0.38	2.57±0.37	2.62±0.32	0.56**
ACA (°±IQR)	39.00±11.0	39.00±8.0	40.00±8.0	0.89*
ACV (mm^3±IQR)	125.50±34.0	125.0±42.0	121.0±35.0	0.94*
CCT (µm±SD)	538.59±39.14	533.83±38.08	541.15±36.66	0.43**
LT (mm±IQR)	1.32±0.58	1.36±0.51	1.28±0.62	0.26*

*Data are expressed as mean±standard deviation (SD) or median±interquartile range (IQR). ACA=anterior chamber angle; ACD=anterior chamber depth; ACV=anterior chamber volume; AL=axial length; CCT=central corneal thickness; CDVA=corrected-distance visual acuity; IOP=intraocular pressure; K=Keratometry; LT=lens thickness; PXG=pseudoexfoliation glaucoma; PXS=pseudoexfoliation syndrome. *Multiple comparison among the three groups with Kruskal-Wallis test **Multiple comparison among the three groups with One-way Anova test*

Table 2: *Postoperative first month outcomes*

Parameter	PXS (n=94)	PXG (n=77)	NORMAL (n=109)	P value
CDVA (logMAR±IQR)	0.00±0.10	0.02±0.22	0.00±0.0	<0.0001* *(NORMAL>PXS=PXG)*
IOP (mmHg±IQR)	13.00±4.0	13.00±6.0	12.00±4.0	0.90*
IOP change (mmHg±IQR)	-3.00±4.0	-4.00±4.75	-2.00±3.0	0.001* *(PXG>PXS=NORMAL)*
AL (mm±IQR)	23.22±1.20	23.04±1.07	23.10±1.35	0.87*
AL change (mm±IQR)	-0.20±0.08	-0.17±0.07	-0.16±0.06	0.05*
Anterior segment measurements				
Mean K (Diopter±SD)	43.75 ± 1.70	43.76 ± 1.74	43.49 ± 1.55	0.44**
Mean K change (Diopter±IQR)	0.03±0.70	0.03±0.54	0.02±0.55	0.73*
ACD (mm±IQR)	3.44±0.29	3.42±0.36	3.39±0.27	0.71*
ACD change (mm±SD)	0.84±0.35	0.84±0.37	0.78±0.30	0.44**
ACA (°±IQR)	53.00±8.0	54.00±5.0	50.00±7.0	<0.0001* *(PXG=PXS>NORMAL)*
ACA change (°±IQR)	13.00±8.0	14.00±5.0	11.00±5.25	<0.0001* *(PXG=PXS>NORMAL)*
ACV (mm^3±SD)	167.97±27.86	166.08±27.73	166.05±23.84	0.85**
ACV change (mm^3±SD)	43.40±21.34	40.95±20.21	39.42±20.61	0.40**
CCT (µm±SD)	559.03±41.78	558.84±43.08	555.03±44.76	0.76**
CCT change (µm±IQR)	14.00±26.50	24.00±34.75	9.00±25.0	0.002* *(PXG>NORMAL)*

*Data are expressed as mean±standard deviation (SD) or median±interquartile range (IQR). ACA=anterior chamber angle; ACD=anterior chamber depth; ACV=anterior chamber volume; AL=axial length; CCT=central corneal thickness; CDVA=corrected-distance visual acuity; IOP=intraocular pressure; K=Keratometry; PXG=pseudoexfoliation glaucoma; PXS=pseudoexfoliation syndrome. *Multiple comparison among the three groups with Kruskal-Wallis test **Multiple comparison among the three groups with One-way Anova test*

better in the normal eyes when compared to the eyes with PXS (p<0.0001) and the eyes with PXG (p<0.0001). The reduction in IOP was statististically significantly greater in the PXG group than PXS group (p=0.004) and normal group (p<0.0001). The postoperative ACA and change in ACA were statistically significantly lower in the normal eyes than PXS eyes (p<0.0001, both) and PXG eyes (p<0.0001, both). The eyes with PXG showed a statistically significant increase in CCT than normal eyes (p<0.0001).

At the postoperative month 3, the CDVA was statistically significantly worse and IOP was significantly higher in the PXG group among the three groups. These differences were statistically significant only between PXG and normal eyes (p=0.001 and p=0.01, respectively). The ACA was statistically significantly smaller in the normal eyes than PXS eyes (p<0.0001) and PXG eyes (p=0.001). The change in ACA was statistically significantly lower in the normal group when compared to PXS group and PXG group (p<0.0001, both). The eyes with PXS showed statistically significant greater postoperative ACV than those with PXG (p=0.04). The enlargement in ACV was significantly greater in PXS group than PXG group (p=0.02) and normals (p=0.04) (Table 3).

Correlation analysis in the normal eyes revealed that there was a statistically significant correlation between preoperative IOP and change in IOP at postoperative month 1 (R=-0.449, p<0.0001) and month 3 (R=-0.453, p<0.0001). In the eyes with PXS, change in IOP at postoperative month 1(R=-0.341, p=0.001) and month 3 (R=-0.425, p=0.001) were statistically significantly correlated with the preoperative IOP. Significant correlation between IOP change and AL and AS parameters were not found at the first and 3rd months, postoperatively (p > 0.05) in both normals and PXS group.

In the eyes with PXG, the preoperative IOP was statistically significantly associated with change in IOP at

Table 3: *Postoperative month 3 outcomes*

Parameter	PXS (n=94)	PXG (n=77)	NORMAL (n=109)	P value
CDVA (logMAR±IQR)	0.00±0.05	0.00±0.10	0.00±0.00	0.004* *(NORMAL>PXG)*
IOP (mmHg±IQR)	12.80±5.0	13.60±5.0	12.50±4.0	0.04* *(PXG>NORMAL)*
IOP change (mmHg±IQR)	-3.00±4.0	-3.00±3.50	-3.00±3.0	0.27*
AL (mm±IQR)	23.20±0.98	23.02±1.22	23.12±1.38	0.38*
AL change (mm±IQR)	-0.18±0.08	-0.18±0.07	-0.17±0.07	0.20*
Anterior segment measurements				
Mean K (Diopter±SD)	43.73±1.49	43.86±1.66	43.46±1.74	0.26**
Mean K change (Diopter±IQR)	0.03±0.56	-0.07±0.54	-0.04±0.46	0.15*
ACD (mm±IQR)	3.44± 0.25	3.45±0.32	3.45±0.27	0.76*
ACD change (mm±SD)	0.86±0.34	0.86±0.34	0.82 ±0.30	0.59**
ACA (°±IQR)	54.00±7.0	53.00±6.0	51.00±6.0	<0.0001* *(PXG=PXS>NORMAL)*
ACA change (°±IQR)	14.00±8.0	14.00±5.0	11.50±6.0	<0.0001* *(PXG=PXS>NORMAL)*
ACV (mm^3±SD)	176.89±23.25	166.03±27.53	170.13±24.71	0.04** *(PXS>PXG)*
ACV change (mm^3±SD)	52.04±20.16	42.39±21.99	43.66±21.91	0.01** *(PXS>PXG=NORMAL)*
CCT (µm±SD)	539.47±36.98	538.51±37.42	542.58±38.41	0.75**
CCT change (µm±IQR)	2.50±16.50	1.50±15.0	0.60±11.0	0.15*

*Data are expressed as mean±standard deviation (SD) or median±interquartile range (IQR). ACA=anterior chamber angle; ACD=anterior chamber depth; ACV=anterior chamber volume; AL=axial length; CCT=central corneal thickness; CDVA=corrected-distance visual acuity; IOP=intraocular pressure; K=Keratometry; PXG=pseudoexfoliation glaucoma; PXS=pseudoexfoliation syndrome. *Multiple comparison among the three groups with Kruskal-Wallis test **Multiple comparison among the three groups with One-way Anova test*

postoperative first month (R=-0.429, p<0.0001) and 3rd months (R=-0.581, p<0.0001). At postoperative month 1, the IOP change was significantly correlated with change in ACD (R=-0.230, p=0.04) and change in ACV (R=-0.278, p=0.01), and also IOP was statistically significantly correlated with change in ACA (R=-0.230, p=0.04). At postoperative month 3, the only significant association with AS parameters was between postoperative IOP and postoperative ACV (R=-0.240, p=0.04).

CONCLUSION

It is important to know the parameters of the AS in the planning and evaluation of the results of cataract surgery. Predicting effective lens position (ELP) preoperatively is considered to be one of the key factors in obtaining the satisfactory refractive outcome.[19,20] The enlargement in the anterior chamber after surgery has been reported to be greater in the eyes with shallower preoperative anterior chamber and lower postoperative IOP.[21-23] The IOP-lowering effect of cataract surgery in eyes with PEX is thought to be associated with decreased release of exfoliation material, anterior chamber enlargement, and improved trabecular outflow.[24] Although greater deepening in the anterior chamber following cataract surgery has been reported in the eyes with open-angle or angle-closure glaucoma than those without glaucoma,[25-27] to our knowledge in the literature, there is no study comparing these changes between the PEX eyes with or without glaucoma. In the presence of glaucoma, due to the greater zonular instability and more dramatic IOP-lowering effect of cataract removal, postoperative changes in AS parameters may be different in the eyes with PXG compared to the eyes with PXS. The present study is the novel study that compared the AS parameters following cataract surgery between the PXS, PXG and normal eyes.

In the present study, while there were no significant differences in preoperative AS parameters among the three groups, the ACA and change in ACA at postoperative month 1 and month 3 were significantly greater in the PXS and PXG group than the normal group. The significant differences in AS parameters between PXS and PXG eyes were only at postoperative ACV and ACV enlargement at month 3 after surgery.

A recent cross-sectional study that has compared AS parameters measured by Scheimplug camera in PXS, PXG and normal eyes, demonstrated that there was a significant shallower ACD, compared to normal eyes in the PXG eyes but not in the PXS eyes.[28] In Kaygısız et al.'s study, patients with PXG and PXS showed greater LT and shallower ACD than normal subjects in the measurements by optical biometry.[29] In these two studies, none of the AS parameters differed between PXG and PXS groups. There is only one study which have compared the AS configuration following phacoemulsification between the PXG eyes and normals.[30] This previous study has reported that any preoperative AS parameters did not differ between the PXG (54 eyes) and normal group (58 eyes), postoperative ACA and change in ACA were significantly larger in the PXG group**.** The results of the present study were consistent with this recent study. In addition, in the eyes with PXG, thickening of the CCT was greater at postoperative 1 month compared to normal eyes, but this difference disappeared at 3 months.

There have been several studies using different devices, comparing AS parameters before and after cataract surgery between eyes with PXS and normal eyes, the results are controversial.[14-16,31] In a study by Gur Gungor et al.[14], the pre- and postoperative ACD measured by Scheimplug imaging system in PXS group (22 eyes) did not differ significantly from the normal group (30 eyes), however they reported more significant ACD change in PXS group. In Kassos et al.' study,[15] all angle parameters and ACD measured using anterior segment optic coherence tomography (AS-OCT), increased significantly after phacoemulsification in both PXS (42 eyes) and normal group (39 eyes), with no significant intergroup difference. The only significantly different parameter between the two groups was percentile change in ACD which was greater in PXS eyes. Ramezani et al.[16] compared the anterior chamber angle parameters using AS-OCT, and they showed no difference in the pre- and postoperative angle parameters between PXS (n=30) and non-PXS eyes (n=31). The angle measurements increased significantly in both groups, this effect was insignificantly greater in the PXS eyes. Another study with Pentacam AXL that has included 28 eyes with PEX and 28 eyes without PEX, reported that there was no significant difference in ACD prior to surgery and in ACD at three months postoperatively between the groups.[31] In this study, 10 of 28 PEX eyes were with PXG, however the results of the eyes with PXG have not been specified. In this current study which had the largest series of publications examining postoperative AS configuration in eyes with PXS, postoperative ACA and change in ACA were significantly larger in the PXS group than normal group, in both postoperative measurements. And also, the expansion in ACV was significantly greater in the PXS eyes, at three months postoperatively.

In our study, we compared the outcomes between eyes with PXS and PXG to investigate the effect of the presence of glaucoma on AS parameters following cataract surgery in PEX eyes. There was no significant difference was found in AS parameters between the two groups before surgery and at postoperative 1 month, however the eyes with PXS had a significantly greater ACV and ACV change at 3rd month postoperatively. This may be because the reduction in IOP, which was significantly higher at 1 month in the PXG group among the three groups, became insignificant at 3 months.

Worse visual outcomes after uneventful phacoemulsification have been previously reported in eyes with PXG than those with PXS and normal eyes.[11,30,32] In our study, at postoperative first month, the CDVA was found to be significantly worse in PXG group and PXS group than normals. The difference in visual acuity among the three groups at 3rd months, was significant only between PXG eyes and normal eyes. It may be due to the progressive degeneration of retinal ganglion cells in the eyes with PXG which is typically associated with greater diurnal IOP fluctuations and higher mean IOP levels.

In a few recent studies evaluating the association between the change in AS configuration and IOP decrease after cataract surgery in the eyes with PEX, the reduction in IOP was positively correlated with preoperative IOP levels.[16,33] However a significant correlation was not found between IOP change and AS parameters. These results have been explained by the fact that microscopic trabecular meshwork changes other than macroscopic angle parameters may play a role in determining the IOP level in these eyes. In our study, the IOP reduction was significantly associated only with preoperative IOP in the PXS group and in the normal group. In the eyes with PXG, the association between preoperative IOP and postoperative IOP change was similar to those in the eyes with PXS and normal eyes. At first month, the decrease in IOP correlated with deepening in ACD and ACV and also postoperative IOP was negatively correlated with enlargement in ACA**.** At month 3, the postoperative IOP was negatively correlated with postoperative ACV. These results may suggest that macroscopic AS changes may occur in the eyes with PXG due to the longer duration of PEX infiltration and weaker zonules compared to those with PXS and normal eyes.

The present study has some limitations. The effect of peroperative parameters, such as the cumulative dissipated energy of phaco or volume of irrigation fluid, on the results could not be analyzed because of it's retrospective design. We could not compare the visual field mean deviation and pattern standard deviation between groups, as the medical records included only the information of absence of glaucomatous visual field defect in PXS and normal groups. We excluded eyes with overt signs of zonular instability (lens subluxation or phacodonesis). In our study, Scheimpflug camera was used to measure AS parameters, different relationships can be found with different imaging methods such as AS-OCT. The follow-up was three months. Future studies are necessary to examine the long-term effects of phacoemulsification on AS configuration in the eyes with PXG and PXS.

In the summary, in this study, after uncomplicated cataract surgery, the eyes with PXG had higher reduction in IOP among the three groups at postoperative first month, however this difference was insignificant at month 3. The PXG and PXS groups showed greater enlargement in ACA than normal eyes. The only difference in AS parameters between PXS and PXG eyes was in ACV measurements at postoperative month 3**.** There was no association between the IOP measurements and any AS parameters in the PXS and normal group. Decrease in IOP correlated with deepening in ACD and ACV and also higher postoperative IOP was correlated with less enlargement in ACA and smaller postoperative ACV, in the PXG group. The PEX eyes with glaucoma may be more responsive to IOP changes in the presence of unstable capsular bag due to zonular weakness.

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