

EVALUATION OF REFRACTIVE CHANGES AFTER YAG LASER CAPSULOTOMY IN PSEUDOPHAKIC PATIENTS

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Introduction

Posterior capsular opacification (PCO) is the most common long-term complication of cataract surgery in both phacoemulsification and extracapsular cataract extraction (ECCE). Some patients experience significant vision complications including decreased visual acuity, glare, and reduced contrast sensitivity, which often require further treatment. Currently, the standard treatment of PCO is Nd:YAG laser posterior capsulotomy, which has a success rate of more than 95%. Nd:YAG laser posterior capsulotomy is the preferred treatment method in PCO with its economical, rapid and non-invasive aspects.

Any significant change in IOL position can lead to a change in the patient's refractive status, which will therefore require corrective lens prescriptions.

Aim of the work

The aim of our study is to evaluate the effect of Nd:YAG laser posterior capsulotomy on patient's refraction.

Patients

This prospective interventional case series was conducted on 100 eyes who underwent uncomplicated phacoemulsification surgery. **Inclusion criteria** Patients who underwent uncomplicated phacoemulsification surgery. Age: Above 40.Complete CCC (Continuous Curvilinear Capsulorhexis). Bagal Implanted IOL. Intra-Ocular Lens (IOL) dioptric power ranges from (12 - 26 D). Clear cornea. Free posterior segment. **Exclusion criteria** Patients with very small Capsulorhexis or capsular phimosis. Patients with corneal pathology such as scarring, keratoconus. Patients with previous history of intraocular surgery other than cataract surgery, Corneal refractive surgeries, Post DALK and PKP.

Methods

All patients included in the study were subjected to the following:•History taking with special emphasis on age, history of previous surgery. •Informed consent was obtained for all patients.•Slit lamp examination.•Measurement of best corrected visual acuity (BCVA) •Fundus examination.•Patient refraction and BCVA were measured before and 2 weeks after of Nd: YAG laser posterior capsulotomy •Patients refraction measured using the automated refractometer (Topcon RM-8900, Topcon, Japan).•The posterior capsulotomies were performed in a single session with a Nd:YAG laser (Ellex Ultra Q™ Laser, Adelaide, Australia) by the same Surgeon.

•All studied patients received a standard medical regimen after laser (0.1% brimonidine eyedrop, one drop immediately after laser; and Tobradex eye drop, three times a day for 1 week).•The Nd:YAG laser was posterior defocused by 0.50 mm in every eye.•The Acrysof ® IOL was Implanted in all cases and it is characterized by it is single-piece acrylic foldable IOL, UV absorbing posterior chamber lens (IOL/ PC), 13.00mm length, 6.0 mm biconvex optic planar haptics.•The patients were divided into two groups according to the period between cataract surgery and Nd:YAG laser posterior capsulotomy. •(Group A) Early Nd:YAG: Patients did YAG capsulotomy within 6 months from cataract surgery.•(Group B) Late Nd:YAG: Patients did YAG capsulotomy after passing more than 6 months from cataract surgery

Results

One hundred patients who were candidates for YAG lens capsulotomy for PCO and fulfilled inclusion criteria were enrolled in the study.The results were BCVA and refractive changes prior to Nd:YAG laser posterior capsulotomy and 2 weeks after the procedure.

Changes in BCVA before and after YAG laser posterior capsulotomy:

In Total patients, the mean BCVA prior to capsulotomy was 0.41 ± 0.19 (SD) and improved to 0.77 ± 0.19 (SD) after capsulotomy. P value was <0.001 which indicate statistically significant improvement in BCVA after capsulotomy.

Table 1 : Comparison between before and after YAG Capsulotomy according to BCVA in each group

BCVA	Total (n = 100)	Group A (n = 16)	Group B (n = 84)
Before			
Min. – Max.	0.10 – 0.80	0.40 – 0.80	0.10 – 0.80
Mean ± SD.	0.41 ± 0.19	0.57 ± 0.13	0.38 ± 0.18
Median (IQR)	0.40 (0.30 – 0.60)	0.60 (0.45 – 0.65)	0.40 (0.25 – 0.50)
After			
Min. – Max.	0.30 – 1.0	0.80 – 1.0	0.30 – 1.0
Mean ± SD.	0.77 ± 0.19	0.91 ± 0.09	0.74 ± 0.19
Median (IQR)	0.80 (0.60 – 0.90)	0.90 (0.80 – 1.0)	0.80 (0.60 – 0.90)
t (p)	t=27.132* (p<0.001*)	t=18.902* (p<0.001*)	t=23.517* (p<0.001*)

Spherical equivalent: In Total patients, the mean spherical equivalent changed from -0.87 ± 1.53 (SD) before capsulotomy to be -0.78 ± 1.20 (SD) after 2 weeks capsulotomy; that show no significant changes in spherical equivalent where the p value was 0.525. The mean increase was 0.09 ± 1.02 . (table2)

Table 2 : Comparison between before and after YAG Capsulotomy according to spherical equivalent in each group

Spherical equivalent	Total (n = 100)	Group A (n = 16)	Group B (n = 84)
Before			
Min. – Max.	-4.0 – 2.25	-4.0 – 1.75	-4.0 – 2.25
Mean ± SD.	-0.87 ± 1.53	-1.18 ± 1.78	-0.81 ± 1.48
Median (IQR)	-0.69 (-1.88 – 0.13)	-1.50 (-2.44 – 0.06)	-0.63 (-1.75 – 0.13)
After			
Min. – Max.	-3.50 – 2.13	-3.0 – 1.88	-3.50 – 2.13
Mean ± SD.	-0.78 ± 1.20	-1.02 ± 1.38	-0.73 ± 1.17
Median (IQR)	-0.75 (-1.50 – 0.0)	-1.25 (-2.13 – 0.0)	-0.63 (-1.44 – 0.0)
Z (p)	Z=0.635 (p=0.525)	Z=0.415 (p=0.679)	Z=0.493 (p=0.622)

Conclusion

The YAG laser capsulotomy is standard treatment for PCO and has been found to be safe and effective improvement in visual acuity after Nd: YAG laser capsulotomy in patients with significant PCO regardless the period between Phaco surgery and YAG capsulotomy. Despite lack of clinical change in refractive error and SE after the YAG capsulotomy, we suggest that patients be refracted after the procedure due to their improvement in BCVA .



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