

Refractive change after YAG laser anterior capsulotomy in capsular phimosis syndrome

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Abstract: Aim of the Work: To measure the refractive change after YAG laser capsulotomy in cases of capsular phimosis after cataract surgery and IOL implantation. **Site of the Study:** University hospitals "Alhussein Hospital and Sayed Galal University Hospital" Cairo, Egypt. **Design:** Prospective randomized masked clinical trial. **Methods:** 16 eye of 16 pts with capsular phimosis after phacoemulsification and in the bag IOL implantation, the eyes undergone refractive assessment using autorefractometer and the refraction is calculated as a spherical equivalent before, one day and one month after YAG laser capsulotomy. **Results:** the mean and standard deviation of spherical equivalent of the 16 eyes of 16 patients included in the study before and after the YAG laser intervention. The result was 4.33929 ± 2.97361 before YAG laser capsulotomy and 1.94643 ± 0.86702 one day and 1.875 ± 0.80209 one month after yag laser capsulotomy. There was a significant change of refraction between before and one day after the YAG with p value of 0.00766, and there was no significant change between one day and one month after the YAG with p value of 0.82276. **Conclusion:** There is a significant change of the spherical equivalent of post operative refractive error due to capsular phimosis one day after treatment with YAG laser capsulotomy and no further significant change after one month later.

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Key words: Refractive change, YAG laser anterior capsulotomy, capsular phimosis syndrome

1.Introduction:

One of the causes of post operative alteration of visual acuity after uneventful phaco emulsification and an IOL implantation is changes in the IOL's position and resultant shifts in refraction which is the result of capsular phimosis syndrome or anterior capsule contraction syndrome. It may be diagnosed during the clinical follow-up of patients. The risk of the capsular phimosis syndrome is highest in the first 3 to 6 months after cataract surgery. The first evidence of this problem is seen either by direct visualization of the capsule at the slit lamp or by changes in the IOL's position and resultant shifts in refraction. The specific description of anterior capsular contraction syndrome was published in 1993, following the widespread adoption of the continuous curvilinear capsulorhexis (CCC).¹⁻²

Pathogenesis

Its etiology is that the cells of posterior capsule migration involves anterior, cuboidal lens epithelial cell metaplasia with myofibroblastic transformation. The altered cells contain smooth muscle actin, and contraction occurs in the resultant fibrous membrane. Anterior capsular opacity and shrinkage usually occur much earlier than posterior capsular opacification (PCO) (e.g, within the first 3 to 6 months postoperatively). Studies have shown that some opacity and shrinkage probably occur after every case of cataract extraction.³⁻⁴ sever cases may lead to posterior dislocation of the in bag IOL into the vitreous cavity.⁸

If surgeons note apparent contraction of the anterior capsular opening, they should perform relaxing radial incisions around the margin of the capsulorhexis with aNd:YAG laser. If done early enough, this treatment will usually alleviate the capsular force on the lens implant and zonules.⁵⁻⁷

Aim of the Work:

To study the effect of YAG laser anterior capsulotomy on the postoperative refractive shift and IOL power change which occur as a result of capsular phimosis syndrome.

2. Patients and Methods:

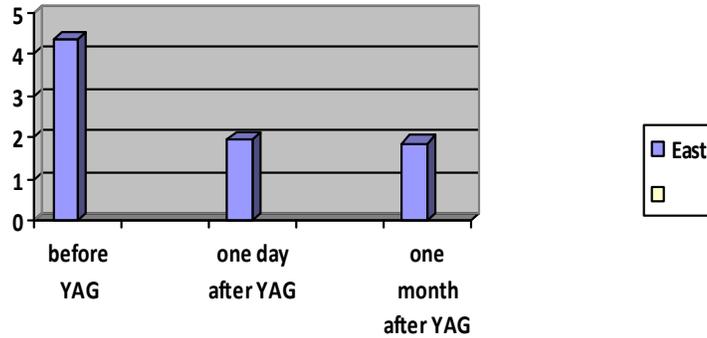
Sixteen eyes of 16 patients were subjected to YAG laser anterior capsulotomy to release the anterior capsule contraction. After the case is diagnosed, a refraction is taken, and verified, brimonidine hcl eye drops is installed into the eye four times per day one day before the procedure, pupil is dilated, four radial cuts are done in the anterior capsule each in one quadrant using YAG laser, the power of the YAG laser ranges from 2 to 6 mj, cidamex tablets are given after the procedure and continuation of the brimonidine hcl eye drops for two days after the procedure, the refraction is measured one day and one month after the procedure.

3. Results

The mean and standard deviation of spherical equivalent of the 16 eyes of 16 patients included in the study before and after the yag laser intervention. The

result was 4.33929 ± 2.97361 before yag laser capsulotomy and -1.94643 ± 0.86702 one day after yag laser capsulotomy with p value of 0.00766. The mean and standard deviation of spherical equivalent one

month after the YAG was 1.875 ± 0.80209 with insignificant change between one day and one month after YAG; p value is 0.82276.



A graph shows the difference between the refractive spherical equivalent before and after yag laser radial anterior capsulotomy

	Pre YAG radial anterior capsulotomy	Post YAG radial anterior capsulotomy	P value
Refraction As spherical equivalent	4.33929 ± 2.97361	1.94643 ± 0.86702	0.00766.

A table shows the difference between the refractive spherical equivalent before and after yag laser radial anterior capsulotomy

	One day post YAG	One month post YAG	P value
Refraction As spherical equivalent	1.94643 ± 0.86702	1.875 ± 0.80209	0.82276

A table shows the difference between the refractive spherical equivalent one day and one month after yag laser radial anterior capsulotomy

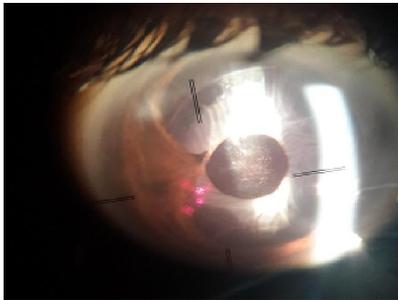


Photo of anterior capsule contraction on slit lamp before YAG laser anterior radial cuts

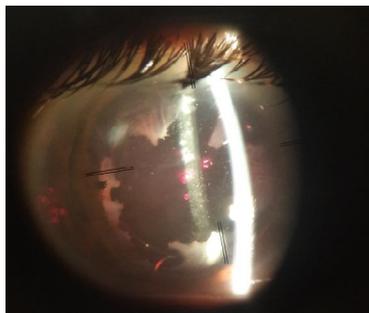
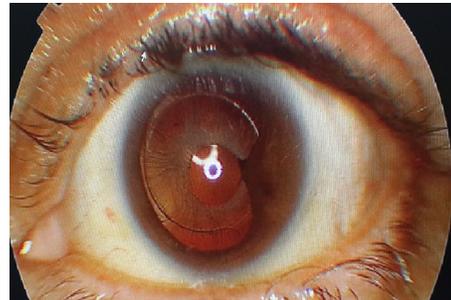
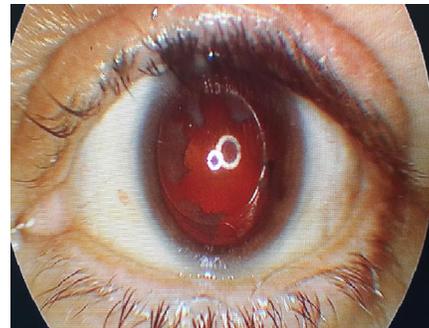


Photo of anterior capsule contraction on slit lamp after YAG laser anterior radial cuts



Lt photo before and rt after YAG laser anterior capsulotomy

4. Discussion

As the anterior capsule opacification progresses, fibrosis of the capsular bag can occur and the lens implant can shift out of its original position, inducing a change in the refractive state of the eye⁹. Capsular phimosis or contraction of the anterior capsular rim can cause the lens to be shifted posteriorly in the capsular bag, which induces a hyperopic shift to the refraction. Using the Nd:YAG laser to perform relaxing incisions of the anterior capsular rim can release the tension of the phimosis and allow the optic to return to its appropriate position, bringing the refraction closer to plano¹⁰.

Our patients were near emmetropia just after phacoemulsification and IOL implantation, gradually the start to complaint of diminution of vision. This diminution of vision is accompanied with refractive change as shown in our results and also associated with change in the anterior capsule ranging from mild opacification and corrugation to full-blown picture of anterior capsule contraction syndrome.

After careful assessment YAG laser anterior radial release incisions are done in the anterior capsule.

The refractive shift towards the emmetropia that occur after YAG laser anterior capsulotomy was significant as evidenced by the p value, and this change is due to IOL position modulation after cutting the contracting fibers and lessening the contraction force of the capsule on the IOL.

The remaining refractive deficit (insignificant change one month after YAG laser) after the treatment with YAG laser anterior capsulotomy may be due to fibrotic adhesion in the equator.

Conclusion

Anterior capsule contraction syndrome (capsular phimosis syndrome) may cause refractive change after successful phaco emulsification and IOL implantation.

There is significant change in the refraction one day after the YAG laser capsulotomy with insignificant change one month later.

YAG laser anterior capsulotomy is an effective tool in managing capsular phimosis syndrome.

Early use of YAG laser in treatment of capsular phimosis may prevent serious complication as zonular dialysis and posterior dislocation of the in bag IOL.

References:

1. Gimbel HV, Neuhann T. Continuous curvilinear capsulorhexis (letter). *J Cataract Refract Surg.* 1991;17:110-111.
2. Hanson S, Crandall A, Olson R. Progressive constriction of the anterior capsular opening following intact capsulorhexis. *J Cataract Refract Surg.* 1993;19:77-82.
3. Werner L, Pandey S, Escobar-Gomez M, et al. Anterior capsule opacification: a histopathological study comparing different IOL styles. *Ophthalmology.* 2000;107:463-471.
4. Davison JA. Capsule contraction syndrome. *J Cataract Refract Surg.* 1993;19:582-589.
5. Masket S. Postoperative complications of capsulorhexis. *J Cataract Refract Surg.* 1993;19:721-724.
6. Jardim D, Soloway B, Starr C. Asymmetric vault of an accommodating intraocular lens. *J Cataract Refractive Surg.* 2006;34:7-350.
7. Moreno-Montanes J, et al. Complete anterior capsule contraction after phacoemulsification with acrylic intraocular lens and endocapsular ring implantation. *J Cataract Refract Surg.* 2002;28:717-719.
8. Ahmed I, Chen, S, Kranemann C, Wong DT. Surgical repositioning of dislocated capsular tension rings. *Ophthalmology.* 2005;112:1725-1733.
9. Hanson R, Rubinstein A, Sarangapani S, et al. Effect of lens epithelial cell aspiration on postoperative capsulorhexis contraction with the use of the Acrysof intraocular lens. *J Cataract Refract Surg.* 2006;32:1621-1626.
10. Jardim D, Soloway B, Starr C. Asymmetric vault of an accommodating intraocular lens. *J Cataract Refractive Surg.* 2006;34:7-350.