

# Severe Anterior Capsular Contraction Syndrome Presenting with Hypotony and Hyperopic Shift in A High Myope with History of Scleral Buckling

Swati Singh, MS; Vikas Veerwal, MS; Arindam Chakravarti, MS

Department of Cataract and Glaucoma, Centre for Sight Eye hospitals, New Delhi • E-mail Address : [sng\\_swt@yahoo.co.in](mailto:sng_swt@yahoo.co.in)



## Abstract :

Anterior capsular contraction syndrome (ACCS) is a known complication of cataract surgery caused by fibroblastic metaplasia of residual lens epithelial cells. The disease may take an aggressive form in eyes with zonulopathy because of an imbalance of centripetal and centrifugal forces acting on the capsular bag. Hypotony is an uncommon complication of this syndrome which can be associated with ciliary body detachment. Presence of hypotony with severe ACCS in a patient of high myopia and previous scleral buckling is a therapeutic challenge which if not treated in time can lead to major vision threatening complications.

**Key words :** Anterior capsular contraction syndrome, Hypotony, Hyperopia, Scleral buckling, Myopia

Anterior capsular contraction syndrome (ACCS) is a known complication of cataract surgery characterized by extreme fibrosis and contracture of the capsular bag with phimosis and even complete occlusion of the capsulotomy opening. Fibroblastic metaplasia of residual lens epithelial cells (LEC) in response to surgical trauma is the most widely accepted explanation for this disorder.<sup>1</sup> A small sized capsulorhexis can induce capsular phimosis because of greater area of contact between LEC and anterior surface of alloplastic intraocular lens implant.<sup>1</sup> Eyes with zonular weakness, whether pre-existing or acquired intraoperatively are more prone to get extreme degrees of capsular shrinkage because of an imbalance between centripetal and centrifugal forces acting on the capsular bag.<sup>1</sup> Myopia, uveitis, post vitreoretinal surgery status, pseudoexfoliation, myotonic dystrophy are known risk factors.<sup>2</sup> Hypotony and ciliary body detachment are uncommon complications of ACCS by excessive centripetal tractional forces.<sup>3-8</sup> But presence of capsular contracture with hypotony in a high myopic patient with previous scleral buckling can complicate the picture. An early intervention in these cases can prevent vision loss. We report a case of a high myope with past history of scleral buckling (SB) who developed hypotony and a hyperopic shift with severe anterior capsular contraction syndrome after phacoemulsification surgery with a single piece hydrophobic acrylic to rici intraocular lens (IOL).

## Case presentation :

A 38-year-old man with no systemic illness, visited us for a sudden diminution of vision in his left eye. He was a high myope and had lost vision in right eye in childhood secondary to an untreated retinal detachment. He also had a history of

scleral buckling and cryopexy done in left eye 14 years ago for detached retina. Recently he had a phacoemulsification surgery done in left eye with a toric IOL at another hospital. His postoperative uncorrected distance visual acuity (UDVA) was 6/6. But at six weeks he started having blurring of vision in left eye and visited our centre. On examination we found his left eye UDVA was 6/24 and corrected distance visual acuity (CDVA), 6/9 with +2.00 DS. There was ciliary tenderness and intraocular pressure (IOP) with applanation tonometry was 03 mm. Siedel's test was negative, cornea clear, pupil round and reacting to light. Anterior chamber was deep and a mild cellular reaction (1+) was present. A severe capsular shrinkage with fibrosis was seen with the capsulorhexis opening phimosed to 1.5 – 2 mm size and both the haptics of the IOL flexed anteriorly, folded over the optic.

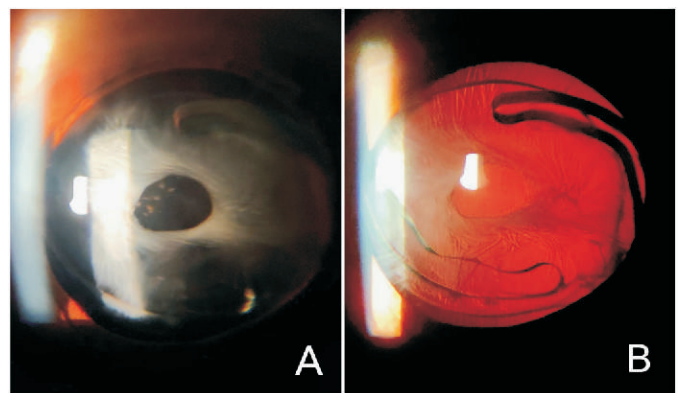


Figure 1 a : Severe anterior capsular phimosis at first visit. Figure 1 b : Retroillumination picture showing anteriorly flexed IOL haptics

The IOL however, did not appear decentred. On dilated examination a posterior vitreous detachment was seen with no evidence of vitritis .Retina was attached with a healthy disc and fine epiretinal membrane (ERM) at macula.

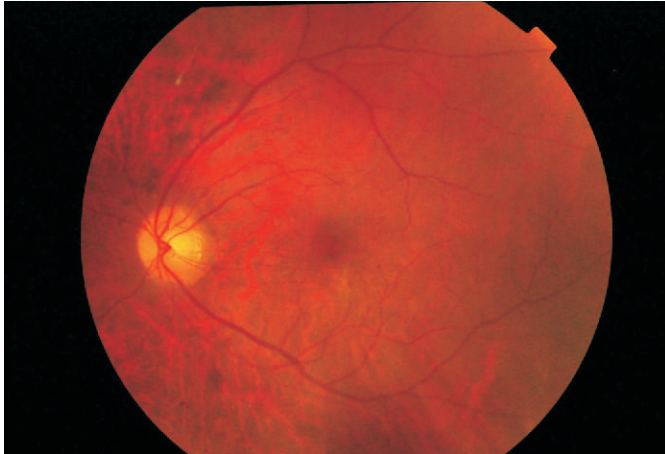


Figure 2 : Fundus picture showing healthy optic nerve and attached retina.

Few chorioretinal folds were present along inferotemporal arcade. Superior peripheral cryoscars and a 3600 buckle effect was seen, but nochoroidal effusion, buckle exposure, intrusion or scleral perforation was evident.

Few chorioretinal folds were present along inferotemporal arcade. Superior peripheral cryoscars and a 3600 buckle effect was seen, but nochoroidal effusion, buckle exposure, intrusion or scleral perforation was evident.

**Investigations :**

B-scan ultrasonography showed mild retino-choroidal thickening. Ultrasound biomicroscopy (UBM) showed mild thickening of ciliary body without any detachment or effusion. A thick membrane corresponding to fibrosed capsule was seen over the IOL with stretched zonules .



Figure 3 : Left eye UBM shows attached ciliary body and no effusion.

OCT scan showed maintained foveal contour and ERM.

**Treatment :**

Patient was started on oral and topical steroids with Atropine eyedrop 6 hourly. The IOP was still 5 mmHg after a week when we decided to do Nd:YAG laser anterior capsulotomy. Laser procedure was done in a stepwise fashion in three sittings (in 10 days) to avoid using too much energy at a time. Multiple radial cuts were given along the fibrosed rim, enlarging it to approximately 5 mm size by the third visit .

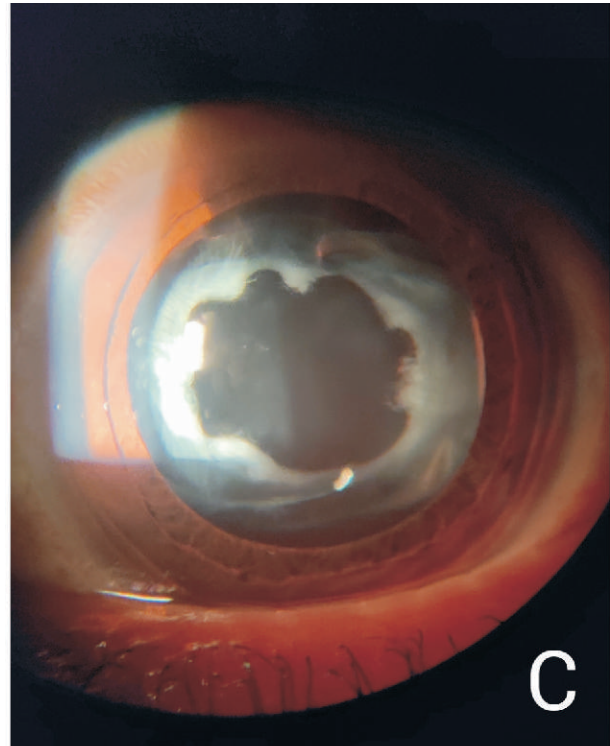


Figure 1 a : After completion of Nd:YAG laser treatment with enlarged capsular opening.

There was gradual improvement in vision to 6/6 and IOP was raised to 11 mmHg. A reduction in contact area of haptics with the IOL optic was seen. A total of 102 laser shots and 138mJof energy was used. Retina examination was carried out on each sitting before and after the laser treatment. A slow tapering of topical steroid was done over 6 weeks. At 3 months follow up visit, with topical steroids stopped for more than 6 weeks, the eye was quiet and patient asymptomatic.

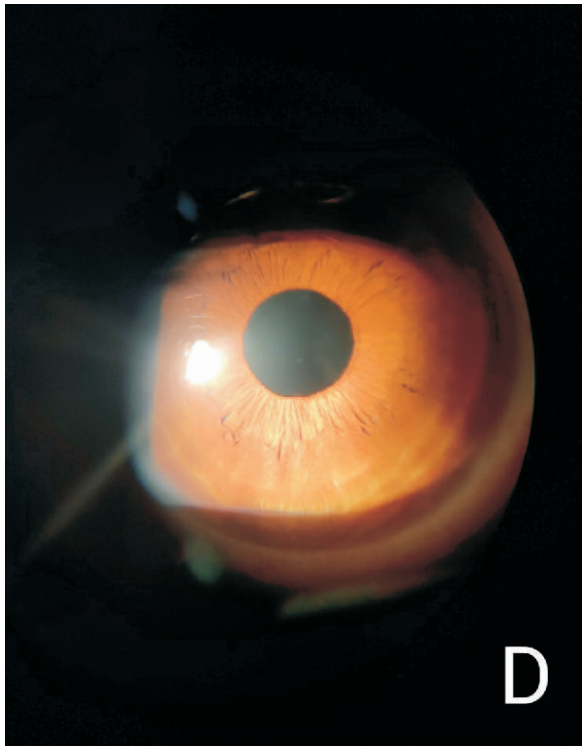


Figure 1 a : Left eye at 3 months follow-up

UDVA was 6/6, and near vision n6 with +2.00 D addition. The retina is attached and IOP in normal range now. Patient is under close follow up.

#### Discussion :

The differential diagnosis for hypotony in this case was.<sup>1</sup> Traction on ciliary body by stretched zonules and inflammation.<sup>2</sup> Progressive scleral thinning with secondary complications of SB surgery. However, the patient had been doing well for 14 years post SB and no hypotony was noted before this episode. A meticulous retina examination, and investigations helped in ruling out scleral perforation, infection and buckle intrusion and only then we proceeded with laser treatment. A rapid development of capsular fibrosis in our patient can be attributed to high myopia. High circulating level of transforming growth factor- $\beta$  2 in aqueous humor of myopes has been implicated for ACCS.<sup>9</sup> Extreme contracture can induce a hyperopic shift by anterior flexion of haptics, shifting the IOL optic posteriorly. There are only 6 case reports of 7 patients of ACCS with hypotony.<sup>3-8</sup> We found that out of 7 patients, 5 were known cases of glaucoma and 4 had previously operated trabeculectomy.<sup>4,7</sup> The only case with no other ocular pathology was reported by Lanzl et al where choroidal detachment accompanied ACCS after 18 months of cataract surgery and

responded to laser treatment.<sup>3</sup> Williams et al reported a case of pars planitis with augmented trabeculectomy done who had high IOP after uncomplicated cataract surgery and Tablet Acetazolamide was given twice daily following which the patient developed hypotony and uveitis on 6th day and capsular contraction with ciliary body detachment was noted at 5 weeks.<sup>7</sup> Wang et al reported a patient who developed bilateral ACCS with ciliary body detachment which resolved post laser.<sup>8</sup> Unlike previous reports, our patient had hypotony and choroidal folds but no cilio-choroidal detachment. The possible reasons could be an early visit to the clinic as soon as he experienced visual deterioration. Inflammation and edema of CB induced by zonular stretching may have caused reduced aqueous secretion in this case. This was confirmed with the prompt resolution of hypotony after YAG laser treatment.

Hypotony secondary to globe perforation, intrusion or extrusion of buckle has been reported even many years after surgery in high myopes.<sup>10</sup> The management priority would have changed in such a condition.

#### Conclusion :

To conclude, anterior capsular contraction syndrome can cause hypotony after cataract surgery in patients with high myopia and the role of UBM is important to rule out ciliary body detachment. YAG laser capsulotomy is an effective method for treatment and avoids the risks of infection and other complications of surgery. However, extra care and close monitoring is needed in patients with scleral buckling who are prone to get vision threatening complications.

**Declaration of Consent :** A written informed consent has been obtained from the patient for publication of case report and de-identified images.

#### References:

1. Davison JA. Capsule contraction syndrome. J Cataract Refract Surg. 1993 Sep;19(5):582-9. Doi: 10.1016/s0886-3350(13)80004-1. PMID: 8229711.
2. Kato, Satoshi & Suzuki, Toshikazu & Hayashi, Yoshie & Numaga, Jiro & Hattori, Tadashi & Yuguchi, Takuma & Kaiya, Tadayoshi & Oshika, Tetsuro. (2002). Risk factors for contraction of the anterior capsule opening after cataract surgery. Journal of cataract and refractive surgery. 28. 109-12. 10.1016/S0886-3350(01)00901-4.
3. Lanzl IM, Kopp C. Ciliary body detachment caused by capsule contraction. J Cataract Refract Surg. 1999 Oct;25(10):1412-4. Doi: 10.1016/s0886-3350(99)00213-8. PMID: 10511946.
4. Srinivasan S, van der Hoek J, Green F, Atta HR. Tractional ciliary body detachment, choroidal effusion, and hypotony caused by severe anterior lens capsule contraction following cataract surgery [letter]. Br J Ophthalmol 2001; 85:1261-1262.
5. Salzmann J, Khaw PT, Laidlaw A. Choroidal effusions and hypotony caused by severe anterior lens capsule contraction after cataract surgery. Am J Ophthalmol. 2000 Feb;129(2):253-4. Doi: 10.1016/s0002-9394(99)00319-0. PMID: 10682983.

6. Musa F, Aralikatti AK, Prasad S. Choroidal effusion and hypotony caused by severe anterior lens capsule contraction following cataract surgery. *Eur J Ophthalmol.* 2004 Mar-Apr;14(2):153-5. doi: 10.1177/112067210401400212. PMID: 15134114.

7. Williams TA, Bansal A, Sung V. Early tractional ciliary body detachment in a uveitic eye after cataract surgery managed with circumferential anterior capsulectomy. *Br J Ophthalmol.* 2008 Mar;92(3):430-1. doi: 10.1136/bjo.2007.120857. PMID: 18303171.

8. Wang, Wei MD, PhD; Chen, Min MD, PhD; Wang, Yao MD; Yao, Ke MD, PhD. Bilateral capsule contraction syndrome-induced ciliary body detachment, *Journal of Cataract & Refractive*

*Surgery.* 2015 Feb; 41(2): 468-70. Doi: 10.1016/j.jcrs.2014.11.03.

9. Zhang K, Zhu X, Chen M, Sun X, Yang J, Zhou P, Lu Y. Elevated Transforming Growth Factor-β 2 in the Aqueous Humor: A Possible Explanation for High Rate of Capsular Contraction Syndrome in High Myopia. *J Ophthalmol.* 2016;2016:5438676. doi: 10.1155/2016/5438676. Epub 2016 Jan 28. PMID: 26942002; PMCID: PMC4749807.

10. Andrei-Alexandru Szigiato, Matthew B. Schlenker, Robert Devenyi, Iqbal Ike K. Ahmed. Hypotony secondary to perforation by scleral buckle, *Canadian Journal of Ophthalmology*, Volume 53, Issue 4, 2018, Pages e156-e158, ISSN 0008 4182.

