

Late-Onset Capsular Block Syndrome: A One Year Follow-up Case Report

Ludovico Lannetti¹, Mauro Salducci²
¹⁻²Sapienza University of Roma, Italy

PJO – Official Journal of Ophthalmological Society of Pakistan



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ABSTRACT

We report a case of late Capsular Block Syndrome (CBS) in a patient who underwent cataract surgery 12 years back. It was diagnosed with slit-lamp examination and by using anterior segment optical coherence tomography (AS-OCT) that showed hyper-reflective material trapped in the capsular bag, between the IOL posterior surface and the posterior capsule. Anterior capsule fibrosis was seen in both eyes but in the left eye capsulorhexis showed irregular margins and had a smaller diameter compared to the right eye. The CBS was treated with Nd:YAG laser capsulotomy allowing rapid evacuation of liquid towards the vitreous chamber. Complete resolution of CBS was confirmed by AS-OCT. Best Corrected Visual Acuity (BCVA) of left eye improved from 0.2 logMAR before treatment to 0.0 logMAR one week after treatment. BCVA remained unchanged after one year of follow-up with no sign of new posterior capsular fibrosis.

Keywords: Capsular block syndrome, Optical Coherence Tomography, Nd:YAG laser, Capsulotomy, Capsulorhexis.

How to Cite this Article: Lannetti L, Salducci M. Late-Onset Capsular Block Syndrome: A One Year Follow-up Case Report. 2024;40(2):212-215. **Doi:** [10.36351/pjo.v40i2.1676](https://doi.org/10.36351/pjo.v40i2.1676)

Correspondence to: Mauro Salducci
Sapienza University of Roma, Italy
Email: mauro.salducci@uniroma1.it

Received: June 14, 2023
Accepted: March 19, 2024

INTRODUCTION

Late-onset CBS is an uncommon post-operative complication of cataract surgery seen with continuous curvilinear capsulorhexis (CCC) and in-the-bag placement of posterior chamber intraocular lens (IOL). It occurs due to adherence at 360 degrees between the CCC edge and the anterior surface of the IOL that can create a sequestered space for the accumulation of transparent or turbid milky fluid.¹ CBS can be asymptomatic or can cause high intraocular pressure, tension on the posterior capsular bag and IOL anterior placement with consequent myopic shift and anterior chamber shallowing.² Several options of treatment for CBS have been described.³ The most widely used technique is the Nd:YAG laser capsulotomy. It creates an opening in the posterior capsular bag and

subsequent leakage of the milky fluid into the vitreous cavity. A surgical approach has been suggested in cases of late CBS resistant to laser treatment by performing pars plana vitrectomy and a surgical posterior capsulotomy.⁴

CASE PRESENTATION

A 76-year-old female presented with blurred vision in both eyes. She had history of uncomplicated phacoemulsification with acrylic hydrophobic intraocular lens (IOL) implantation (Sensar AR40, +20.5 D in both eyes, Abbott Medical Optics Inc., Santa Ana, California) in the capsular bag in both eyes 12 years back.

Best Corrected Visual Acuity (BVCA) was 0.3 logMAR in the right eye and 0.2 logMAR in the left eye. Slit-lamp examination showed posterior capsule opacification in the right eye while in the left eye opaque posterior capsule was separated from the posterior surface of the lens by a milky liquid material. Anterior capsule fibrosis was seen in both eyes. Left eye had irregular margins of capsulorhexis and had a smaller diameter compared to the right eye. The

capsulorhexis was curvilinear, regular and 5.5 mm diameter in the right eye and irregular, decentralized and 4 mm in the left eye.

Intraocular pressure (IOP) was 16 mmHg in both eyes. Ultrasound test showed an attached retina without significant abnormalities in the vitreous cavity. AS-OCT (Optovue-Ivue) showed hyper-reflective material trapped in the capsular bag, between the IOL posterior surface and the posterior capsule, without anterior chamber shallowing, angle closure or IOL displacement (**Figure 1**). A diagnosis of late-onset CBS was made. The patient underwent Nd:YAG laser posterior capsulotomy in both eyes. In the left eye the procedure let the liquid inside the capsular bag to be displaced into the vitreous cavity, without any IOL displacement, as shown by the slit-lamp examination and AS-OCT scan performed 1 week after the treatment (**Figure 2**). One week after capsulotomy, BCVA improved to 0.0 logMAR in both eyes and no signs of inflammation or endophthalmitis was observed. The patient was reviewed at 1 month, 3 months and 6 months and BCVA and clinical condition were unchanged. After one year of follow-up BVCA remained 0.0 logMAR in both eyes while the slit-lamp examination and the AS-OCT showed no new fluid formation between the IOL and the posterior capsule (**Figure 3**).

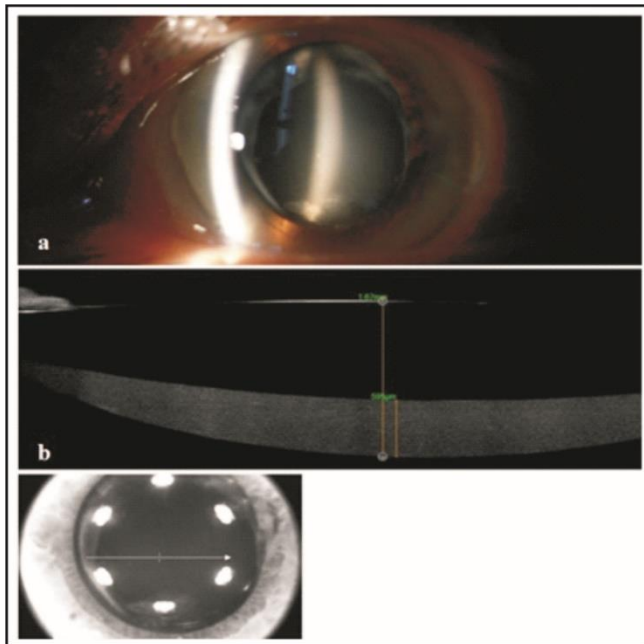


Fig. 1: Slit-lamp biomicroscopy(a) showing presence of milky fluid trapped behind the IOL. Anterior segment OCT(b) scan showing hyper-reflective material included between the IOL and the posterior capsule.

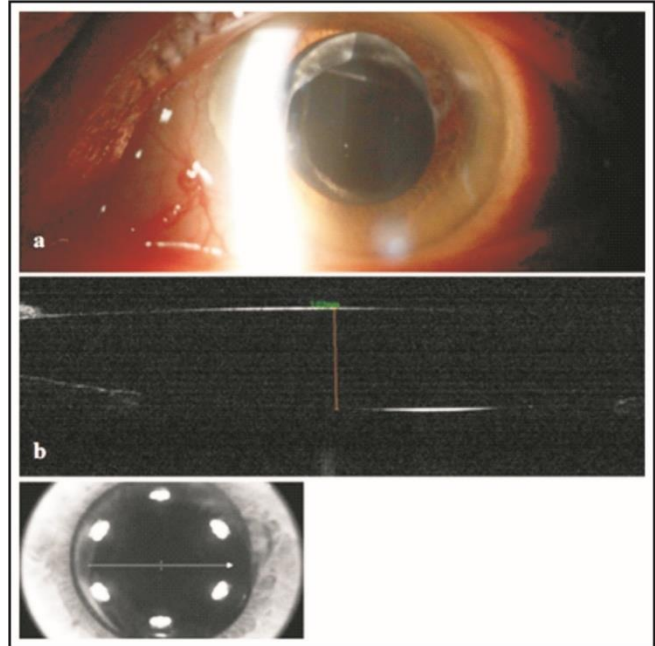


Fig. 2: Slit-lamp biomicroscopy (a) and anterior segment OCT scan(b) one week after Nd:YAG laser posterior capsulotomy showing complete resolution of fluid trapped between the IOL and the posterior capsule.

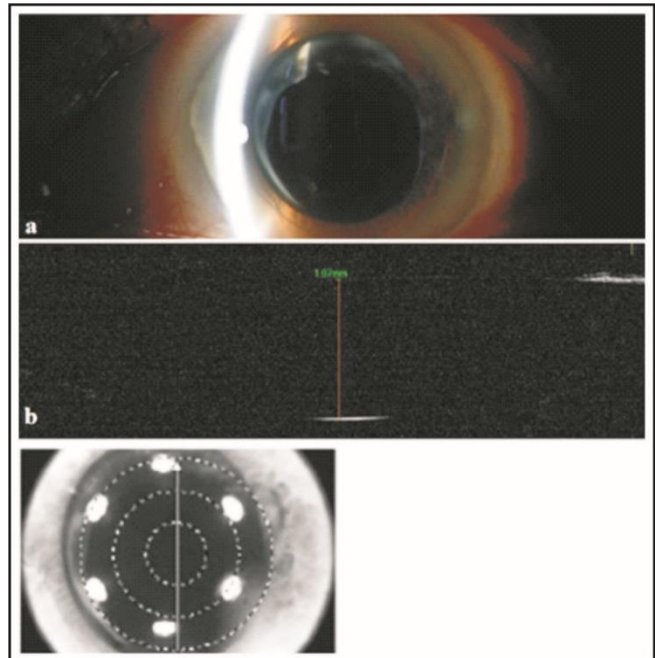


Fig. 3: Slit-lamp biomicroscopy (a) and anterior segment OCT scan (b) one year after Nd:YAG laser posterior capsulotomy showing no new fluid formation between the IOL and the posterior capsule.

Ethical standards and the Helsinki Declaration were followed in reporting this case and written informed consent was obtained from the patient for

publication of this case report and any accompanying images.

DISCUSSION

The late onset CBS is an uncommon post-operative complication of cataract surgery with an incidence of 0.73%.⁵ This condition can be asymptomatic or can cause ocular hypertension, glaucoma and blurred vision especially in early onset.⁶ Two mechanisms can be responsible for the visual impairment; myopic shift induced by anterior displacement of IOL due to the fluid accumulation and turbid liquid that can cause decrease in visual acuity.⁷

A CBS classification depending on the time of onset has been described; intraoperative (during surgery), early postoperative (from 1 day to 2 weeks after surgery) and late postoperative (more than 3.8 years after surgery).⁷ CBS can be non-cellular, inflammatory or fibrotic based on clinical characteristics.⁸ The non-cellular CBS has very early postoperative onset, shallow anterior chamber and IOL displacement due to retained viscoelastic. The inflammatory CBS has onset several days after cataract surgery, and it is caused by an inflammatory reaction in the anterior chamber. The fibrotic CBS has late postoperative onset, from months to years and it is characterized by adhesion between the CCC and IOL, opacification of posterior capsule and presence of characteristic milky fluid.⁷ The late onset fibrotic CBS also known as lacteocruemiasia is caused by residual lens epithelial cells proliferations and pseudometaplasia which leads to the adhesion of the CCC with the anterior IOL optic and to the production of milky fluid retained in the retrolental space. According to these two classifications we defined our case as late postoperative, fibrotic CBS.

Rana et al, reported a case of late CBS occurred 8 years after cataract surgery, treated successfully with surgical procedure via pars plana.⁸ The unique characteristic of our case is that although the IOL models implanted during the cataract surgery were exactly the same in both eyes, even in the dioptric power, and time since surgery (12 years), we found in one eye a classic posterior lens capsule opacification, while in the other eye an unusual late CBS. Another characteristic feature is that the case was presented very late after 12 years. Considering the pathophysiology of late CBS we assume that a small decentralized anterior capsulorhexis associated with

the proliferation and pseudo-metaplasia of the lens epithelium could have caused the whitish material accumulation in the retrolental space. Therefore, we suggest a CCC during cataract surgery as much regular as possible and large at least 5 mm in order to avoid or minimize the potential risk of late CBS.

AS-OCT is helpful in confirming the diagnosis.^{9,10,11} We used AS-OCT and slit-lamp examination for diagnosis and to evaluate the amount of retrolental milky fluid and its complete resolution after treatment and to monitor the clinical course during the entire follow-up. Treatment with Nd:YAG laser posterior capsulotomy allowing the rapid evacuation of liquid toward the vitreous chamber was sufficient to provide a complete, quick and lasting resolution of the CBS.

CONCLUSION

Late-onset capsular block syndrome (CBS) is a post-operative complication that can manifest even after a significant period following surgery. Ensuring an appropriate capsulorhexis during cataract surgery could potentially prevent its occurrence, highlighting the importance of meticulous surgical technique. In the diagnosis and follow-up of late-onset CBS, Anterior Segment Optical Coherence Tomography (AS-OCT) plays a crucial role, offering detailed imaging and assessment of the anterior segment structures.

When late-onset CBS does occur, Nd:YAG laser posterior capsulotomy emerges as a first-line treatment option. This procedure is both safe and effective in resolving the complications associated with CBS, providing patients with improved visual outcomes and relief from symptoms.

Conflict of Interest: Authors declared no conflict of interest.

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Authors Designation and Contribution

Ludovico Lannetti; Consultant Ophthalmologist: *Concepts, Design, Literature search, Data acquisition, Data analysis, Manuscript review.*

Mauro Salducci; Professor: *Concepts, Design, Literature search, Data analysis, Manuscript preparation, Manuscript editing, Manuscript review.*

