Surgical Technique

Management of late-onset flocculent after-cataract with capsular bag lavage and posterior continuous curvilinear capsulorhexis

Jeewan Singh Titiyal, Ruchita Falera, Manpreet Kaur, Tarun Arora

We describe our technique for the management of late-onset liquefied after-cataract (LAC) to ensure long-term visual axis clarity. The densely adherent anterior capsular rim over the intraocular lens (IOL) optic was released with the help of microvitreoretinal blade, and multiple relaxing radial incisions were made on the capsular rim to facilitate easy access to the capsular bag. A thorough capsular bag lavage was performed with the help of bimanual irrigation-aspiration. Posterior continuous curvilinear capsulorhexis (PCCC) was performed after complete aspiration of fluid after-cataract to prevent recurrence. This technique was successfully performed in 14 cases. Postoperatively, IOL was stable and an uncorrected distance visual acuity of >20/32 was achieved in all cases. No recurrence was observed in any case over a follow-up of 1 year. Our technique of capsular bag lavage with PCCC is safe and effective for the management of LAC with optimal visual and anatomical outcomes.

Key words: Capsular bag lavage, late-onset after-cataract, posterior continuous curvilinear capsulorhexis

Video Available on: www.ijo.in

Access this article online

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_1324_17

Quick Response Code:

Posterior capsular opacification or after-cataract is the most common complication of cataract surgery with an incidence ranging from <5% to 50%.[1,2] Liquefied after-cataract (LAC) or lacteocrumenasia is a rare variant of after-cataract with an incidence of 0.27% and is characteristically observed in cases with a well-centered optimal size capsulorhexis.[3] Various techniques such as Nd: YAG capsulotomy and capsular bag lavage have been described for the management of LAC.[4,5] We herein present a novel technique to achieve optimal visual and anatomical outcomes in late-onset LAC.

Surgical Technique

We performed capsular bag lavage with posterior continuous curvilinear capsulorhexis (PCCC) in cases with late-onset LAC [Video 1 and Figs. 1, 2]. Informed consent was obtained from all patients, and the study adheres to the tenets of the Declaration of Helsinki.

Intraoperatively, two side port entries were made at 90° and 240° using a 20-G microvitreoretinal (MVR) blade (Alcon Laboratories, Inc.). The anterior chamber was formed using a cohesive ophthalmic viscosurgical device (OVD) (Healon®, Abbott, Illinois, USA). The anterior capsulorhexis margin firmly adhered to the intraocular lens (IOL) optic and could not be separated with a 27-G cannula. The adhesions were released using a sharp MVR blade in one quadrant opposite to the side port entry [Fig. 2b]. A 27-G cannula was inserted through this space and swept circumferentially to release the remaining adhesions. Eight radial nicks were made in the anterior capsule rim circumferentially with 23-G intravitreal scissors (Grieshaber DSP), extending from the anterior capsulorhexis edge to beyond the IOL optic [Fig. 2c]. A 27-G cannula was carefully maneuvered beneath IOL, and the bag was filled with cohesive OVD [Fig. 2d]. The flocculent LAC was aspirated using bimanual irrigation-aspiration (IA) system [Fig. 2e and f]. The bag was refilled with OVD, a bent 26-G needle was used to create the initial nick in the posterior capsule, and PCCC of 3.5–4 mm diameter was performed [Fig. 2g and h] using 23-G internal limiting membrane (ILM) peeling forceps without disturbing the anterior hyaloid face. The residual OVD was then aspirated using bimanual IA system. Corneal wounds were hydrated at the end of the surgery.

Postoperatively, the patients were prescribed topical antibiotics and topical steroids for 1 month and cycloplegic for 1 week.

This procedure was successfully performed in 14 eyes of 14 patients (8 males, 6 females). The preoperative characteristics and postoperative outcomes are summarized in Table 1. The mean interval between the primary phacoemulsification surgery and

Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India

Correspondence to: Dr. Jeewan Singh Titiyal, Cornea, Cataract and Refractive Surgery Services, Dr. Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, Ansari Nagar, New Delhi - 110 029, India. E-mail: titiyal@gmail.com

Manuscript received: 10.01.18; Revision accepted: 25.03.18

Cite this article as: Titiyal JS, Falera R, Kaur M, Arora T. Management of late-onset flocculent after-cataract with capsular bag lavage and posterior continuous curvilinear capsulorhexis. Indian J Ophthalmol 2018;66:984-7.

Table 1: Demographic details and preoperative and postoperative characteristics of cases with liquefied aftercataract

Age (years)	Sex	Duration from primary surgery (months)	Type of IOL	Capsular bag distension (microns)	Preoperative visual acuity (logMAR units)	Postoperative visual acuity (logMAR units)	IOP (mm of Hg)	Follow-up (months)
80	Male	48	Multipiece	403	0.5	0.2	14	6
74	Male	64	Single piece	314	0.6	0.2	10	8
76	Female	34	Single piece	357	0.8	0.2	14	11
64	Male	44	Single piece	488	0.3	0	16	10
66	Female	26	Single piece	542	0.6	0.1	12	4
63	Female	32	Single piece	324	0.5	0	12	2
84	Male	62	Single piece	398	0.6	0.2	16	6
71	Female	28	Single piece	452	0.3	0.1	12	1
86	Male	84	Single piece	476	0.5	0.2	14	1
79	Male	34	Multipiece	422	0.5	0.1	18	5
68	Female	40	Single piece	378	0.6	0.2	16	3
76	Male	26	Multipiece	512	0.8	0.2	18	3
63	Female	36	Single piece	392	0.3	0	16	4
69	Male	48	Single piece	463	0.2	0	14	2

IOL: Intraocular lens, IOP: Intraocular pressure, LogMAR: Logarithm of minimum angle of resolution

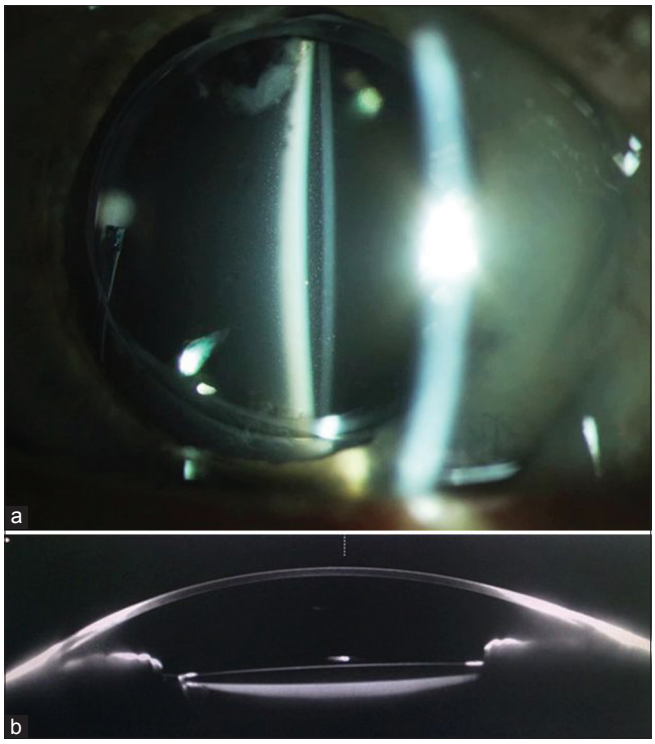

Figure 1: Preoperative image of liquefied after cataract with capsular bag distension. (a) Slit illumination showing liquefied after-cataract with capsular bag distension. (b) Scheimpflug image showing liquefied after-cataract with capsular bag distension

current procedure was 43.2 ± 16.6 months. In all cases, the anterior capsulorhexis was circular, well centered, and 0.5–0.75 mm smaller than the IOL optic, with 360° IOL coverage. A qualitative or quantitative analysis of the volume of liquefied material was not performed. The extent of posterior capsular distension was measured with intraoperative OCT using our previously described technique[6] and ranged from 314 to 542 microns.

Intraoperative complications such as hyphema, capsular bag dialysis, extension of the radial cuts, and damage to IOL was not observed in any case. The anterior hyaloid face was not disturbed and an anterior vitrectomy was not needed in any case.

All patients had improvement in uncorrected distance visual acuity with a stable IOL, and no case developed excessive inflammation, increased IOP, or endophthalmitis. No recurrence of visual axis opacification was noted till the last follow-up of 1 year.

Discussion

Late-onset LAC may present years after an uneventful cataract surgery with diminution of vision without associated myopic shift or shallow anterior chamber.[7]

Various modalities have been described to manage late-onset LAC, such as Nd: YAG laser capsulotomy and capsular bag lavage.[4,5] However, laser capsulotomy carries a potential risk of dissemination of the liquefied fluid into the vitreous cavity or anterior chamber and subsequent inflammation. The fluid containing collagen and extracellular

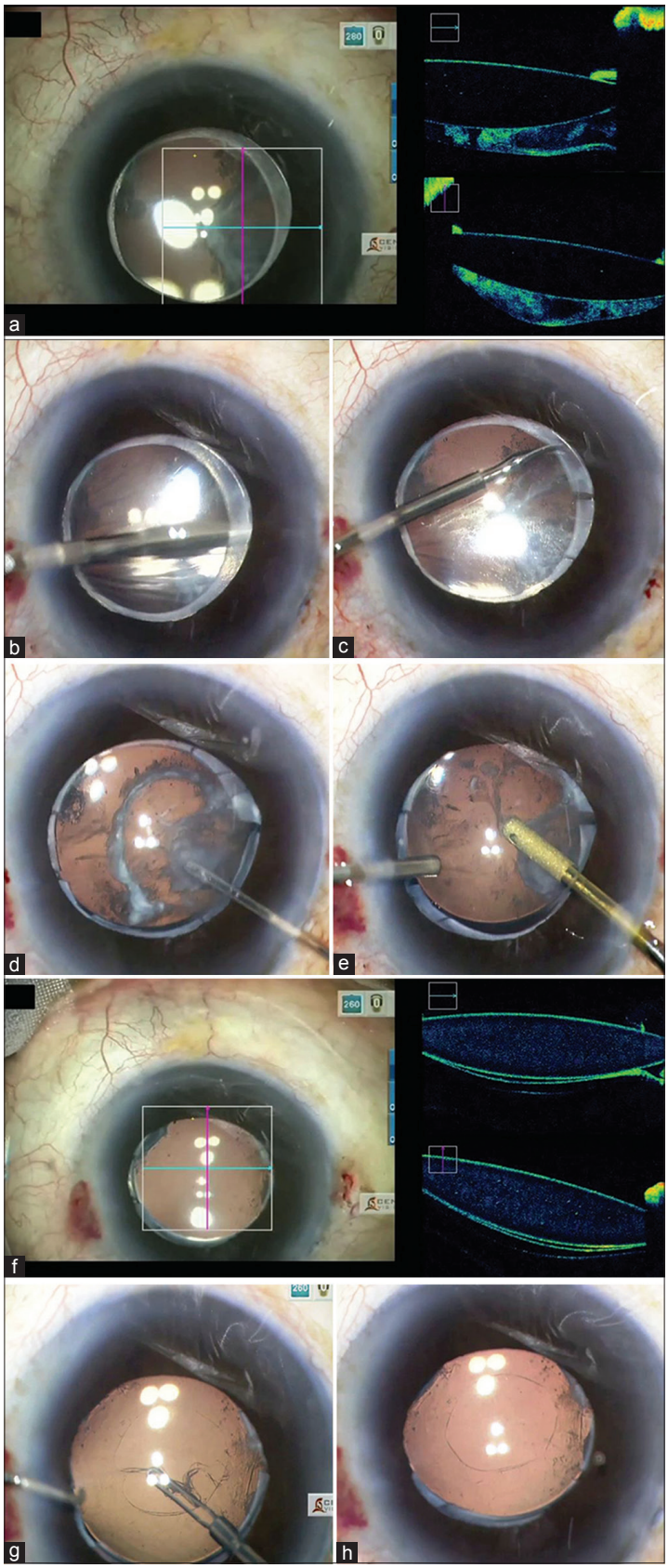

Figure 2: Capsular bag lavage with posterior continuous curvilinear capsulorhexis. (a) Intraocular lens-capsulorhexis complex with distended capsular bag. (b) Adhesions released with microvitreoretinal blade. (c) Radial nicks made with intravitreal scissors. (d) Capsular bag filled with cohesive ophthalmic viscosurgical device. (e) Capsular bag lavage. (f) Complete removal of flocculent cortical matter. (g) Posterior continuous curvilinear capsulorhexis. (h) Removal of residual ophthalmic viscosurgical device

matrix may clog the trabecular meshwork and elevate IOP.[8] Moreover, *Propionibacterium acnes* have been cultured in the opalescent fluid, and laser capsulotomy may potentially risk the spread of infection in such cases.[9] The closed chamber IA of the flocculent after-cataract in our technique helps prevent its dispersion in the anterior chamber and subsequent IOP spikes.

We made eight equidistant radial nicks all along the circumference of the anterior capsular rim to allow greater area of access within the bag for complete removal of the flocculent material. The capsular bag may be reopened without the need for radial cuts in some cases; however, all our cases had fibrosed IOL-anterior capsule complex and we recommend making radial cuts to prevent inadvertent complications such as bag and zonular dialysis during subsequent manipulations. The fibrosed nature of the anterior capsular rim prevented inadvertent extension of the nicks during the procedure. The length of the nicks beyond the IOL optic prevents a repeat adherence of the IOL optic and minimizes the risk of recurrence.

The posterior capsule is thickened and fibrosed in long-standing cases, which may lead to a decrease in the quality of vision. A simultaneous PCCC along with capsular bag lavage helps restore visual axis clarity and also removes the scaffold for future development of after-cataract in the visual axis. Theoretically, a Nd:YAG laser capsulotomy can be performed after capsular bag lavage instead of a PCCC. However, in addition to being a two-stage procedure, it is fraught with other complications such as IOP rise, cystoid macular edema, iritis, and retinal detachment.[10]

We used MVR blade, 23-G intravitreal scissors, and ILM peeling forceps in our technique. Anterior segment forceps and scissors may be used instead, which will minimize IOL movement during surgery. In our series, all IOLs were made of hydrophobic acrylic; of these, three were multipiece and 11 were single piece. IOL material and model may influence the development of LAC; however, we cannot conclusively comment on it as we did not have other type of IOLs in our series.

We did not use topical nepafenac in the postoperative period though it may be used in cases with an exaggerated inflammatory response to decrease potential complications.

Vigorous manipulations within the bag may lead to capsular bag dialysis, extension of the radial nicks, or damage to IOL, such as breakage of haptic. PCCC in the presence of a fibrosed IOL-bag complex may be challenging and result in capsulorhexis extension with vitreous loss. These complications should be anticipated, and the risk-benefit ratio should be analyzed. We advocate this technique in cases of LAC with significant bag distension and lots of flocculent material. Cases with minimal bag distension may be managed with laser capsulotomy alone.

Conclusion

Our technique of capsular bag lavage with PCCC is safe and effective for the management of LAC with optimal visual and anatomical outcomes.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Raj SM, Vasavada AR, Johar SR, Vasavada VA, Vasavada VA. Post-operative capsular opacification: A review. Int J Biomed Sci 2007;3:237-50.
2. Apple DJ, Solomon KD, Tetz MR, Assia EI, Holland EY, Legler UF. *et al*. Posterior capsule opacification. Survey Ophthalmol 1992;37:73-116.
3. Miyake K, Ota I, Miyake S, Horiguchi M. Liquefied aftercataract: A complication of continuous curvilinear capsulorhexis and intraocular lens implantation in the lens capsule. Am J Ophthalmol 1998;125:429-35.
4. Sato K, Tabira K. Five consecutive cases of liquefied aftercataract: Impact of Nd: YAG laser capsulotomy on refraction and high-order aberrations. Open Ophthalmol J 2012;6:26-8.
5. Bhattacharjee H, Bhattacharjee K, Bhattacharjee P, Das D, Gogoi K, Arati D, *et al.* Liquefied after cataract and its surgical treatment. Indian J Ophthalmol 2014;62:580-4.
6. Titiyal JS, Kaur M, Sahu S, Sharma N, Sinha R. Real-time assessment of intraoperative vaulting in implantable collamer lens and correlation with postoperative vaulting. Eur J Ophthalmol 2017;27:21-5.
7. Bao YZ, Pei XT, Li MW, Li XX. Late postoperative capsular block syndrome versus liquefied after-cataract. J Cataract Refract Surg 2008;34:1799-802.
8. Durak I, Ozbek Z, Ferliel ST, Oner FH, Söylev M. Early postoperative capsular block syndrome. J Cataract Refract Surg 2001;27:555-9.
9. Kollias AN, Vogel MA, de Kaspar HM, Lackerbauer CA, Grueterich M. *Propionibacterium acnes* in capsular bag distension syndrome. J Cataract Refract Surg 2010;36:167-9.
10. Karahan E, Er D, Kaynak S. An overview of Nd: YAG laser capsulotomy. Med Hypothesis Discov Innov Ophthalmol 2014;3:45-50.