Peeling and aspiration of elschnig pearls! An effective alternative to Nd:YAG laser capsulotomy!

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To evaluate the efficacy of peeling and aspiration of Elschnig pearls. Retrospective study in a medical college hospital. Records of 217 eyes which underwent surgical peeling and aspiration for membranous PCO between 2006 and 2009, was reviewed. Peeling and aspiration was fashioned with a blunt tipped 20G cannula after stabilizing anterior chamber with anterior chamber maintainer. Post-operative vision and complications were analyzed. Mc Nemar and Chi square tests. The mean age was 56.84 years. 85.71% patients achieved best corrected visual acuity (BCVA) of 20/20 at 3 m. Recurrence of pearls, uveitis and cystoid macular edema were the most common causes of reduced vision. Peeling and aspiration of pearls seem to be a viable alternative to Neodymium yttrium garner aluminium (Nd: YAG) laser capsulotomy for membranous PCO.

Key words: Anterior chamber maintainer, best corrected visual acuity, neodymium yttrium aluminium garnet laser, ocular visco-surgical device, posterior capsule opacification

Advancements in technique of surgery, recognition of importance of thorough cortical cleanup, better intraocular lens (IOL) designs and biomaterials, have all lead to reduction in PCO rates to less than 10%.[1]

However, PCO still exists and intervention is required to provide visual rehabilitation and to deal with pathology in the posterior segment. Nd: YAG laser capsulotomy is currently the gold standard procedure.[2]

Laser capsulotomy may potentially lead to posterior segment complications, threatening vision. With our technique, we explore a possibility of getting rid of Elschnig pearls without compromising on the integrity of posterior capsule.

Access this article online

Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/0301-4738.119449

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Manuscript received: 20.06.12; Revision accepted: 09.04.13

Materials and Methods

We retrospectively reviewed the hospital records of 217 eyes with pearl form of PCO for age related cataract (>45 years).

A quiet post-operative phase of minimum 6 weeks, Sulcus (S-S), Sulcus-Bag (S-B) and in the bag (B-B) fixated IOL's with potential space between IOL optic and CCC margin were prerequisites.

Patients with fibrous PCO, poor pupillary dilatation, capsulorrhexis size less than 5.5 mm, posterior synechia and posterior capsule plaques, capsular phimosis and anterior capsule opacification were excluded.

Improvement in BCVA and complications were primary and secondary outcome measures respectively.

THE TECHNIQUE: Two side port entries (aspiration port and ACM port) were made with a 20G MVR blade (3 and 6 o clock positions respectively). An initial attempt must be made to dial the intra-ocular lens. With a specially designed [Fig. 1] 20 G curved, blunt tipped single port (0.3 mm) cannula (CKB), the IOL edge was slightly lifted to create a space for insinuation of cannula.

A blunt tip guided peeling was initiated from the center towards the periphery by to and fro motion. Peeled pearls were then aspirated by the cannula [Figs. 2-4]. Each quadrant was dealt with in a similar way.

Anterior chamber was thoroughly washed with irrigating fluid and IOL was re positioned, and paracentesis hydrated.

Results

Twenty patients were lost in follow up by 6 m. The mean age was 56.84 years (range 40-87 years). The mean follow up period was 30.13 m (range 23-40 m). Two sub-types of membranous PCO were observed. In one sub-type, pre-procedural visual acuity was better; peeling was easier (thin membranous type). In the latter, pre-procedural visual acuity was worse; peeling was difficult (thick membranous type). Re-centration of IOL was performed in 12 eyes (5.5%).

186 eyes (85.71%) had final BCVA of 20/20 at 3 m. 29 (13.36%) eyes had a final vision between 20/30 and 20/40. 2 (0.92%) eyes had a final vision of worse than 20/40 ($P = 0.000$) [Table 1 and Fig. 5].

Recurrence of pearls (11%), IOP spikes (9.67%); CME (2.76%) and posterior capsular rent (2.76%) were the most common complications respectively [Table 2]. The mean duration of recurrence of pearls after successful aspiration was 3.8 ± 1.3 m.

Discussion

Nd:YAG capsulotomy still remains the gold standard for Fibrous form of PCO.[3] Surgical aspiration of pearls seems to be an alternative to Nd: YAG laser capsulotomy in myopic eyes.

Figure 1: CKB (Chandra Kanta Bhargava) silicone tubed cannula attached to a 5 cc syringe. The cannula is 20G, curved, blunt tipped with port size of 0.3 mm

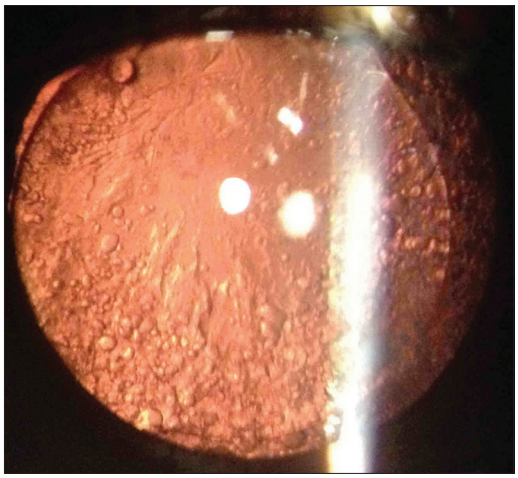

Figure 2: Pearl form of PCO following cataract surgery. The patient has a BCVA of 20/40

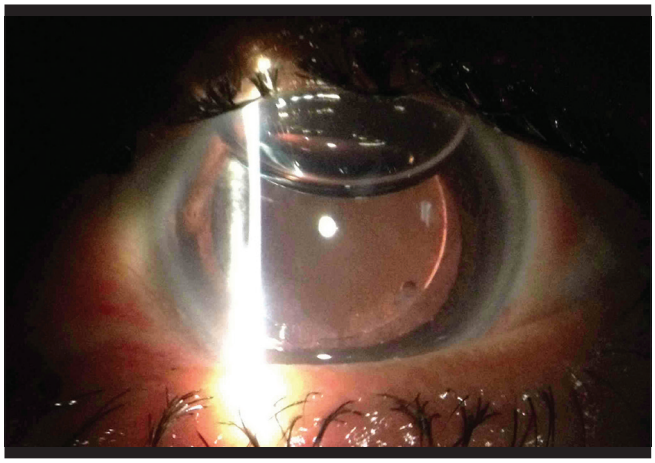

Figure 3: First post-operative day, following surgical peeling and aspiration with air-bubble in anterior chamber

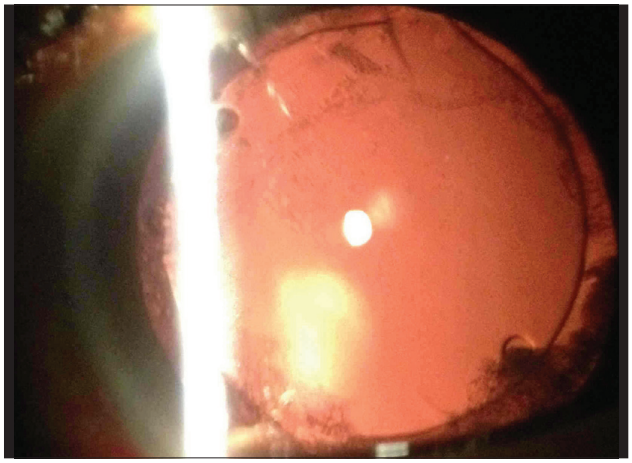

Figure 4: A clear posterior capsule following peeling and aspiration, three months post-operatively. Lens was re-centered

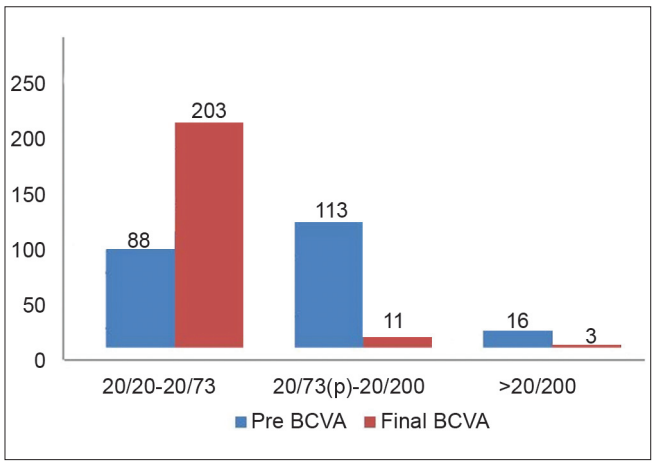

Figure 5: Bar diagram showing correlation between pre-procedural and final BCVA

Only a few authors have advocated surgical peeling and aspiration of pearls, probably due to the invasiveness of the procedure in contrast to laser capsulotomy.[4,5]

Table 1: The pre-procedural and final BCVA comparison using Mc Nemar test

Pre BCVA	Final BCVA	Total		
	20/20-20/73	20/73(*P*)-20/200	>20/200	
20/20-20/73	88	0	0	88
20/73(*P*)-20/200	109	4	0	113
>20/200	6	7	3	16
Total	203	11	3	217

Mc Nemar; *P*<0.001, *The difference in visual acuity is statistically significant, BCVA: Best corrected visual acuity

Table 2: Post-operative complications

Complication	No. of cases	Percentage
Recurrence of pearls	24	11.05
Uveitis	19	8.75
Hyphema	03	1.38
PCR	06	2.76
Raised IOP	21	9.67
CME	06	2.76

Preservation of integrity of posterior capsule with surgical peeling offers a potential advantage over laser capsulotomy as it minimizes the risk of complications like CME and retinal detachment.[6]

PCO prevented adequate visualization of the fundus after cataract surgery, therefore it cannot be said whether OCT defined CME was a result of cataract surgery itself rather than surgical peeling and aspiration.

Nd:YAG lasers induce an additional financial burden on the health care system and may have a significant impact on allocation of health resources in developing countries like India.

The thick subtype of PCO is tough to manage by both procedures. On one hand, it requires higher laser energies to create capsulotomy, bloated cells tend to accumulate along capsulotomy margin obscuring fundus view and on the other hand peeling is tougher with recurrence of pearls. Pars Plana membranectomy is the preferred surgical procedure for the thick subtype of membranous PCO.

Trinkmann *et al*., conducted a study on 367 eyes with membranous PCO in mostly sulcus fixated lenses (95%).[6] They claimed that their specially designed hand piece could aspirate regenerative cells in the equatorial region also. However, they stabilized the AC by adjusting infusion pressure in 1-1.5 mm limbal section. In contrast, we stabilized the AC with an ACM. Our technique was under field of view of operating microscope with a stable closed section. Thus, our technique was safer, simpler and sutures were not required for incision closure.

Klemen *et al*., accomplished successful removal of pearls in 89% of cases (n = 102).[7] The lower incidence of IOP spikes (14.7% versus 9.67%) in our study could be explained by the fact that we did not use any OVD. However incidence of posterior capsule rent was comparable to our study (6.9% versus 2.76%)

Although peeling and aspiration of pearls involves surgical risks, we did not encounter any case of post-operative endopthalmitis. Moreover, re-centeration of a decentered IOL can be performed in the same setting. On the contrary, laser capsulotomy may cause IOL pitting and glare disabilities.

Recurrence of pearls and the necessity of repeated procedures are the main drawbacks of this technique. However, incidence was lower (11% versus 17%) in our study as compared to other studies.[7] Dialing of IOL coupled with the hydro-dynamic flow of irrigating fluid throughout the procedure loosens adhesions between lens haptic and lens fibers in the capsular bag and probably wash out regenerative equatorial lens epithelial cells.

PCO may remain a nagging complication for long as it seems virtually impossible to totally get rid of cells in the equatorial lens bow by any aspiration method currently known. Moreover, we still do not have a complete understanding of factors governing behavior of capsular bag following cataract surgery.[8,9]

Conclusion

Peeling and aspiration of pearls is safe and an effective alternative to Nd:YAG laser capsulotomy.

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Cite this article as: Bhargava R, Kumar P, Sharma SK, Sharma S, Mehra N, Mishra A. Peeling and aspiration of elschnig pearls! An effective alternative to Nd:YAG laser capsulotomy!. Indian J Ophthalmol 2013;61:518-20.

Source of Support: Nil. **Conflict of Interest:** None declared.