

Outcome of Capsular Polishing Operation in Posterior Capsular Opacity

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Central Posterior Capsular Opacification (PCO) obscuring the visual axis can be treated with either surgical intervention, such as posterior capsular polishing or with a nonsurgical Nd:YAG laser capsulotomy. Though the latter method has received wide acceptance but it has the clinical complications like the rise in intraocular pressure or glaucoma, cystoid macular edema and retinal detachment. Probably these are due to cutting of posterior capsule and heat created by laser. So a surgical procedure has been evolved by which capsule has been polished without cutting the posterior capsule make media cleared and the complications that developed by laser can be avoided. The purpose of this study is to see the result of capsular polishing operation with its procedure in the cases of posterior capsular opacity. It is an interventional study of randomized clinical trial of 25 cases PCO of Elschning Pearl category in National Institute of Ophthalmology & Hospital, Dhaka in the period of Jan'11 to Jun'12. The method of surgical procedure is described in details. In this study, visual recovery 6/6/-6/12 is 100%. Surgical technique applied in this study is safe and highly control and very much easy procedure to remove complete or almost complete bladder cells of Elschning pearl saving of posterior capsule. The visual recovery is excellent.

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Introduction

Posterior capsular opacification (PCO) of Lens in the eye caused mainly by post operative proliferation of epithelial cells in the capsular bag is one of the most frequent complication in cataract surgery.^{1,2}

This complication in pseudophakic eye affects the visual recovery by impeding light passing through the eye. Post operative proliferation of Lens epithelial cells in the capsular bag is central to the pathogenesis of

PCO.¹ In normal crystalline lens, a monolayer of epithelial cells are lined to anterior capsule, which is known as 'A' cells, which has minimal mitotic activity.

At the equatorial region, known as 'E' cells, which are quite active in mitosis and new Lens fibers are produced from this zone throughout life. The growth of the equatorial epithelium (E-cell) is in the direction of bloated, swollen, bullous-like bladder (wedl) cells along the posterior capsule. Clinically this variety is known as Elschning pearls which

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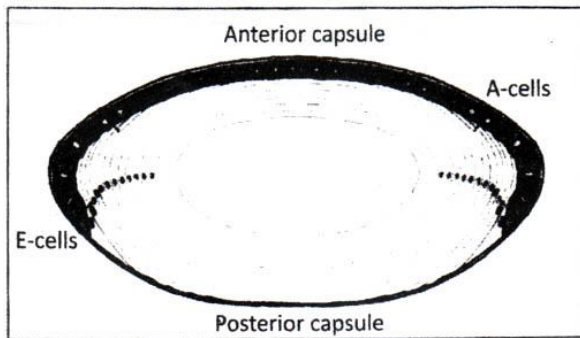


Figure 1. Posterior capsule

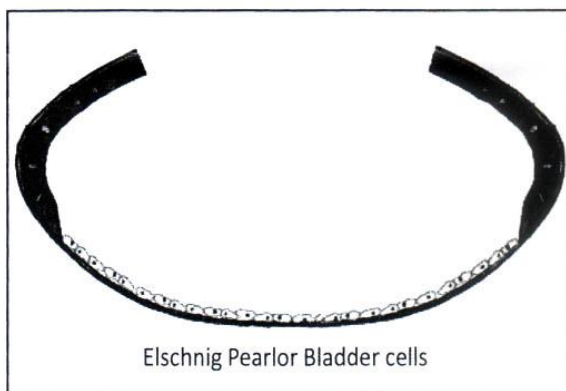


Figure 2 Elchnig Pearl or bladder cell

may easily polished by the tip of two way cannula. Sometimes or after long days it may undergo pseudofibrous metaplasia.^{1,3,7}

E-cells are also responsible for formation of Soemmering's ring^{1,3}, a dumb bell or donut shaped lesion that often forms following any type of rupture of anterior capsule.

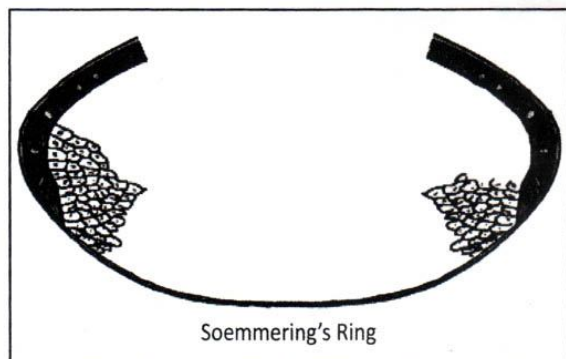


Figure 3. Soemmering's Ring

The residual cortical fibers remains after cataract surgery or the material derived from proliferation of E cells, become dislodged & float freely within the capsular bag, undergo pseudofibrous metaplasia forming Soemmering's ring. They may remain localized or migrate centrally into visual axis. Cells other than the Lens epithelium may be involved in PCO.

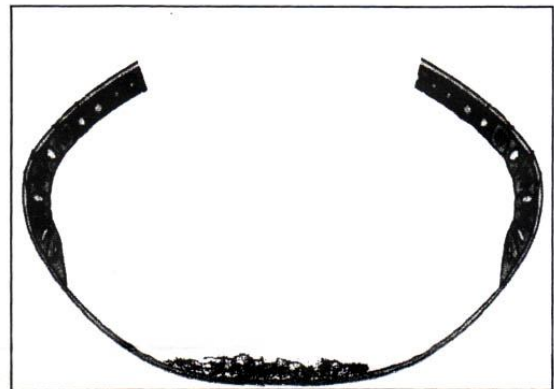


Figure 4. Posterior capsular opacity

Surgical insult causing blood aqueous barrier break releases the inflammatory products such as leucocytes, exudates during and after surgery get deposited over the posterior capsule forming a opaque fibrous membrane.^{1,7} The interval between surgery and opacification ranges from 3 months to 4 years, with an average opacification time being 26 months.⁷ Although cataract is the most common cause of blindness in the world, PCO or after cataract is also extremely common as well. It was particularly common in the early days of IOL surgery when the importance of cortical clean-up was less appreciated. In 1980s and early 1990s the incidence of PCO ranged between 25-50%. Now a days, improvement of cataract surgery have led to gradual, but steady decrease in the incidence of less than 9%.^{2,4}

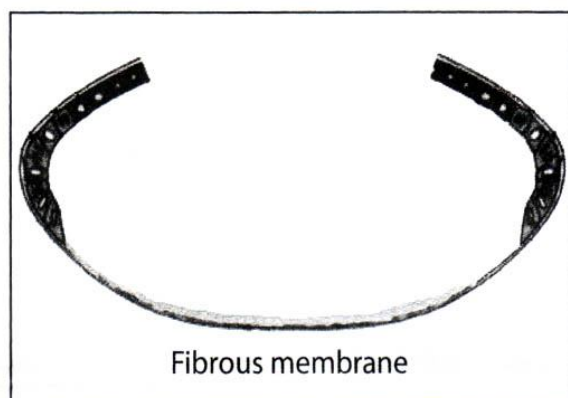


Figure 5. Fibrous membrane

A significant incidence of PCO means that cataract surgery alone may not restore lasting sight to the 25 million people worldwide who are blind from cataract. Although cataract is the most common cause of blindness in the world, after-cataract (PCO or secondary cataract) is an extremely common cause as well. PCO of even a mild degree can decrease near acuity through a multifocal IOL, and may interfere with the function of active/accommodating IOL designs. Central PCO obscuring the visual axis can be treated with either surgical intervention, such as posterior capsule polishing or with a non-surgical Nd:YAG laser capsulotomy. The latter method has received wide acceptance. The need for performing capsulotomy depends on the patient's functional impairment of vision, discomfort, demand and the presence of associated risk factors such as high myopia, history of retinal detachment, high risk of cystoids macular edema and only functioning eye. A size that is larger than the pupil diameter under scotopic conditions may prevent disturbances of vision such as monocular diplopia⁵. The clinical complications from Nd:YAG laser capsulotomy include a rise in intraocular pressure, glaucoma, cystoid macular edema and retinal detachment⁶. With the consideration of above complications of Nd:YAG laser capsulotomy, a surgical

procedure has been evolved by which capsule has been polished without cutting the posterior capsule make media cleared and the complications that developed by laser can be avoided. The purpose of this study is to see the result of capsular polishing operation with its procedure in the cases of posterior capsular opacity.

Methods

Among 520 of Pseudophacose, Posterior Capsular opacity (PCO) was present in 40 (7.7%) cases in the period of January 2011 to June 2012. (Table I). The male was 54% and female was 46%. The mean age was 56.5 years.

Table I: Incidence of PCO

No. of Cases	Age in years	Male	Female	PCO
Pseudophacose (520)	45-85	54%	56%	40 (7.7%)

Among these total PCO, Elschnig Pearl was seen in 25 (62.5%) cases, Soemmering's Ring was in 4 (10%) cases and Pseudofibrous metaplasia was in 6 (15%) cases.

PCO caused by surgical insult where fibrin was deposited by the breakdown of blood-aqueous barrier forming fibrous membrane was seen in 5 (12.5%) cases (Table II).

Table II : Category of PCO

	Types of PCO	No.	%
PCO 40	Pseudofibrous metaplasia	6	15%
	Soemmering's Ring	4	10%
	Elschnig Pearl	25	62.5%
	Fibrous opacity of posterior capsule due to break of BRB.	5	12.5%

Among the 40 cases of PCO, the 25 cases of Elschnig Pearl was taken in the study which was interventional. In National Institute of Ophthalmology and Hospital, Dhaka in the period of January 2011 to June 2012.

PCO was recorded after examining by slit lamp biomicroscope, with retinoscope and ophthalmoscope after dilatation of pupil in all cases. Best corrected preoperative vision was recorded (Table III).

Table III: Best corrected preoperative vision

PCO	Pre-operative V/A	No.	%
	6/18	3	12%
Elsching Pearl 25	6/36	7	28%
	6/60	9	36%
	<6/60	6	24%

After well dilatation of pupil the position of anterior capsule rim in relation of IOL margin was marked. Capsule rim in some cases were at the margin of IOL and it was marked for that cases. These cases were done by one port at that place. Others were done by two port that was described in the surgical procedure.

Surgical procedure

With paralytic anaesthesia, two port of scleracorneal tunnel of 1.5 mm size was done, where one port was at the place to which two way simco-cannula was introduced underneath the IOL but over the posterior capsule and other was for entry of vitreus scissor or retinal scissor to cut the margin of anterior rim of capsule so that cannula could be easily entered the anterior surface of posterior capsule. The cases in which the rim of anterior capsule was placed at the margin of IOL, only one port was done to that site. Under positive pressure in close chamber, the bladder cells was easily aspirated and washed out and the capsule was polished with tip of cannula with balanced salt solution. When a red reflex was seen through microscope evenly specially along visual axis, the surgery was end.

Post-operative follow-up was done at one month.

Results

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Table IV: Best corrected preoperative and Post-operative vision

PCO	Pre-operative			Post-operative		
	V/A			V/A (best corrected)		
	6/18	3	12%	6/6	13	52%
Elschnig	6/36	7	28%	6/9	7	28%
Pearl 25	6/60	9	36%	6/12	5	20%
	<6/60	6	24%			

Complications

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Table V: Post-operative complications

Complications	No	%
Capsule break or tear	1	4%
Post-operative uveitis	1	4%
Incomplete polishing	2	8%

Discussion

In Nd:YAG laser capsulotomy, the site of opening may be eccentric or small in relation with pupil which may create problem in vision. In capsular polishing method, capsule is intact, so no such problem arise.

Consideration of risk factor, such as high myopia, history of retinal detachment, high risk of cystoids macular edema and only functioning eye that may come into contraindication. Capsular polishing method is a good solution as the capsule is intact in these situation.

The clinical complications from Nd:YAG laser capsulotomy include a rise in intraocular pressure, glaucoma, cystoid macular edema and retinal detachment⁶. But these are absent in capsular polishing method.

A size that is larger than the pupil diameter under scotopic conditions may prevent disturbances of vision such as monocular diplopia but it is abolished or not arise in capsular polishing method. Lens distorsion or pitting may occur in Nd:YAG laser capsulotomy, but in capsular polishing method lens remain as it is. Decentration of IOL, if any of case, that can be correct in this method along with polishing of capsule. Surgery is easy. Disadvantage is that anaesthesia and anterior chamber entry is necessary. The risk of recurrence of posterior capsule rupture is less which is only 4% in this study. The functional vision (6/12- 6/6) achieved in cent percent.

Conclusion

Surgical technique applied in this study is safe and highly control and very much easy procedure to remove the bladder cells of PCO. Due to intact capsule and achievement of good functional vision this technique can be practiced for the management of PCO specially in the category of Elschnig Pearl.

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