

## Posterior Capsular Opacification Treated with Surgical Membranectomy

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### Abstract :

*Posterior capsular opacification (PCO) is the most frequent complication of cataract surgery which has a significant impact on vision, including decrease in visual acuity and impaired contrast sensitivity. PCO is recognised as a major problem in paediatric and adolescent cataract surgery where the incidence approaches almost hundred percent. A 17 years old boy presented with complaints of painless, gradually progressive diminution of vision in right eye following an injury for which he underwent cataract surgery with posterior chamber intraocular lens implantation. He was subsequently treated with Neodymium: Yttrium Aluminium Garnet (Nd: YAG) laser capsulotomy which failed. Surgical membranectomy was an effective approach in the management of PCO, refractory to Nd: YAG laser treatment.*

**Keywords:** *Cataract, Posterior capsular opacification, Nd: YAG laser capsulotomy, surgical membranectomy*

### Introduction

Posterior capsular opacification (PCO) is the most frequent complication following cataract surgery which results in significant impact on vision, including decrease in visual acuity and impaired contrast sensitivity [1]. Lens epithelial cells (LECs) left behind in the capsular bag after any type of extra capsular cataract surgery is mainly responsible for PCO formation. Proliferation, migration, epithelial-to-mesenchymal transition (EMT), collagen deposition and lens fibre regeneration of LECs are the main causes of opacification. Left over LECs proliferate and migrate across the posterior capsule and undergo lens fibre regeneration and EMT. Clinically there are 2 morphological types of PCO; the fibrotic type and the pearl type. Fibrotic-type PCO is caused by the proliferation and migration of LECs which undergo EMT, resulting in fibrous metaplasia and leading to significant visual loss by producing folds and wrinkles in the posterior capsule. Pearl-type PCO is caused by the LECs located at the equatorial lens region (lens bow) causing regeneration of crystallin-expressing lenticular fibers forming Elschnig pearls and Soemmering ring, responsible for PCO-related visual loss [2].

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### Case Report

A 17 years old boy reported with the complaints of gradual painless progressive diminution of vision in Right Eye (RE) for 9 years which was not associated with any other complaints. At the age of 4 years, he had received injury to his RE with glass bangle followed by diminution of vision in RE which resulted in development of traumatic cataract for which he underwent RE cataract surgery with Posterior Chamber Intra Ocular Lens (PC IOL) implantation at the age of 4 years.

Systemic examination of the patient was within normal limits. Ocular positions were normal and ocular movements in both eyes were full and free in all directions of gaze.

Visual acuity in RE was reduced to finger counting close to face and in Left Eye (LE) it was 6/6. Slit lamp examination of RE showed presence of PC IOL with optic capture from 8 to 4 o' clock position and thick PCO obstructing the visual axis. Pupil was 3-4 mm in size not reacting to light. Fundus of RE was not visible due to PCO. Slit lamp and fundus findings of the left eye were within normal limits.

Ultrasonography B scan (USG B) of the patient showed no posterior segment abnormality in either eye. Routine blood investigations and chest X-ray were within normal limits.



**Fig 1 : Dense PCO In RE obstructing the visual axis**

Neodymium: Yttrium Aluminium Garnet (Nd: YAG) laser capsulotomy was tried but proved unsuccessful following which surgical membranectomy was carried out. With the help of a number 15 blade, a 3 millimetre partial thickness incision was made at the limbus. Anterior chamber entry was made with the help of keratome. Anterior chamber was maintained with viscoelastic substance. Iridectomy was carried out superiorly with Vanna's scissors. Through the iridectomy opening, Vanna's scissor was introduced and dense PCO adherent to iris was cut vertically from 12 to 6 o'clock position and also at the 3 and 9 o'clock positions thereby making the visual axis clear. Patient was treated with moxifloxacin and dexamethasone eye drops in combination with Timolol 0.5% eye drop postoperatively.



**Fig 2 : Clear visual axis after surgical membranectomy**

Best corrected visual acuity of the patient in operated eye at the time of discharge was 6/36. Right eye vision did not improve further due to dense amblyopia.

### Discussion

Posterior capsular opacification, referred to as secondary cataract or after cataract, develops over the clear posterior capsule a few months to a few years after an uneventful cataract surgery [3]. Secondary cataract (PCO) has been recognised as a major problem in paediatric cataract surgery where the incidence approaches almost one hundred percent. Posterior capsular opacification development is age dependent with a low incidence in older patients but high rates in young patients, especially children and infants. Advances in surgical techniques, intraocular lens materials and designs have reduced the rate of formation of PCO, but it is still a significant problem [4].

At present the only effective treatment of PCO is Neodymium: Yttrium Aluminium Garnet (Nd: YAG) laser capsulotomy which involves clearing the visual axis by creating a central opening in the opacified posterior capsule, but this is associated with complications like IOL optic damage, IOL pitting, postoperative Intraocular Pressure (IOP) elevation, cystoid macular oedema, retinal detachment and IOL subluxation [5]. Posterior capsular opacification in young children is always dense and may need to be removed sometime with additional surgery like surgical membranectomy which is a cost effective technique as compared to pars plana vitrectomy and membranectomy. In our case the child was operated for cataract surgery at a younger age and presented to us with dense PCO very late. The PCO was very dense and not amenable to Nd: YAG laser capsulotomy which is the preferred treatment for PCO. An innovative technique of surgical membranectomy was adopted so that a clear visual axis could be obtained. A best corrected vision of 6/36 because of dense amblyopia was the best possible outcome. Therapy for amblyopia was not tried in our patient because it is usually effective only upto the age of 8 years.

### Conclusion

Capsular opacification, in particular, PCO, still remains the most common cause of late postoperative complication of an uneventful cataract surgery. Surgical membranectomy is a rewarding and cost effective approach in the management of PCO, refractory to Nd: YAG laser treatment.

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