



## Research Paper

# Comparative Study of Incidence of Posterior Capsular Opacification between Pmma and Hydrophobic Acrylic Intraocular Lens Implantation in Senile Cataracts

Authors

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## Abstract

**Introduction:** Posterior Capsular Opacification is due to growth and abnormal proliferation of lens epithelial cells over the posterior capsule which migrate towards the visual axis causes obscuration of vision.

**Aim:** To compare the incidence of Posterior Capsular Opacification following implantation of PMMA Intra ocular lenses with that of Hydrophobic Acrylic Intra ocular lenses after cataract surgery over senile cataract.

**Materials and Methods:** A Total of 200 patients operated by a single surgeon is made into 2 groups. Group A with 109 patients with senile cataract operated by Phacoemulsification with PMMA IOL implantation and Group B with 91 patients with senile cataract operated by phaco emulsification with Hydrophobic Acrylic IOL implantation is studied for a period of 4 years from 2014 to 2018 for the formation of PCO. PCO was analysed and graded under Slit Lamp examination. Data were compared between two groups.

**Results:** A total of 200 eyes underwent Phacoemulsification with IOL implantation. There were 109 patients in group A on whom PMMA lens were implanted. In Group B there were 91 patients on whom hydrophobic Acrylic IOLs been implanted. In group A 28(25.6%) patients developed PCO and in Group B, 11(12.08%) patients developed PCO in the follow up study.

**Conclusion:** Hydrophobic Acrylic IOLs have lesser rate of posterior capsular opacification rate compared to PMMA IOLs.

## Introduction

PCO is one of the common reason for defective vision post operatively in an otherwise uneventful cataract surgery. Posterior Capsular Opacification is due to growth and abnormal proliferation<sup>1</sup> of lens epithelial cells over the posterior capsule

when migrate towards the visual axis causes obscuration of vision. These lens epithelial cells differentiate into pearl forms and fibrous forms thus can form into elshnig pearls and sommering's ring.<sup>10</sup> Thus it causes obscuration of vision,

reduced contrast sensitivity, glare or monocular diplopia.

There are some known risk factors<sup>4</sup> for increased propensity for PCO formation like Paediatric cataracts, cataracts after prolonged intake of steroids<sup>11</sup>, posterior polar cataracts<sup>3</sup> eyes with previous episodes of uveitis, diabetics, myopes.

PCO is treated by NdYAG Laser posterior capsulotomy. It's an effective treatment but can lead on to complications like raised IOP, Macular edema or in very rare instance retinal detachment or endophthalmitis.

### Material and Methods

200 Patients who had underwent uneventful cataract surgery through phacoemulsification by a single surgeon were selected. Among them, two groups were made. Group A comprised of 109 patients who were placed with PMMA IOLs and Group B had 91 patients who had been placed with Hydrophobic Acrylic IOLs. These groups of patients were followed up for 4 years from 2014 till 2018 for PCO formation.

All these patients were operated by a single surgeon by phaco emulsification under peribulbar block. 2.8 mm limbal based incision was made superiorly. continuous curvilinear capsulorhexis is made . hydro dissection and hydro delineation done. Phaco emulsification is done through stop and chop method. After thorough cortical cleanup, foldable IOLs were placed in capsular bag.

Regular post operative follow up was done with visual acuity testing by snellens chart. Proper retinoscopy was done. If patient was found to have defective vision, thorough slit lamp examination was done looking for PCO and thorough retinal evaluation was done. Sellman and Lindstrom grading system was used to grade the PCO during the follow up.

Incidence of PCO formation in both Group A and Group B is compared and tabulated.

### Results

200 Patients underwent uncomplicated phaco emulsification with IOL implantation under Local

Anaesthesia. The average age was 63 years with a range between 38 to 83 years. Group A (PMMA lens) had average age of 62. Average age for Group B (Hydrophobic Acrylic IOLs) was 63 years. Among the 200 patients, 112 (62 in group A and 50 in group B) were female and 88 patients (47 in group A and 41 in group B) were Male.

**Table 1** Sex Wise Distribution of Patients Operated On

	GROUP A	GROUP B
MALE in nos	47	41
FEMALE in nos	62	50
TOTAL	109	91

In the 4 years follow up, In group A where PMMA IOLs been implanted among 109 patients- 28(25.6%) patients developed PCO and in Group B where Hydrophobic Acrylic IOLs been implanted, among 91 patients- 11(12.08%) patients developed significant PCO with visual obscuration and they needed NdYAG Laser posterior capsulotomy for visual improvement.

**Table 2** Incidence of PCO in Comparison between Group A and Group B

	GROUP A(PMMA IOLs)	GROUP B(HYDROPHOBIC ACRYLIC IOLs)
TOTAL PATIENTS in nos	109	91
PATIENTS nos WITH PCO IN FOLLOWUP	28	11
PERCENTAGE OF PCO INCIDENCE	25.6%	12.08%

### Discussion

With the recognition of LECs in the role of PCO formation, lots of technical advancements are done nowadays to prevent PCO formation like larger rhexis, the thorough cortical clean up, polishing the posterior capsule intra operatively. Yet, the incidence of PCO formation has not completely become null. So the focus was shifted towards IOL shapes and materials<sup>2,8,9</sup> in which they were made.

Numerous studies shows that Square edged IOLs<sup>7</sup> cause less PCO formation compared to

conventional round edged IOLs. Also in bag IOL implantation gives lesser PCO formation compared to eccentrically placed lenses.

K Hayashi and H hayashi et al in BJO, Feb 2004 had mentioned elaborately about the reduced incidence of PCO formation in hydrophobic hydrogel lenses<sup>8</sup> compared to conventional PMMA IOLs.

J Hollick and WR Meacock et al in their JJO had studied the effects of PMMA and hydrophobic acrylic lenses over posterior capsule in surgeries performed with larger rhexis.

### Conclusion

Our study gives the result that hydrophobic acrylic IOLs (12.08%) causes lesser incidence of PCO as compared to PMMA lenses (25.6%)

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