ORIGINAL ARTICLE

Posterior Capsular Opacification after Cataract Surgery

Qaim Ali Khan, Yasir Iqbal, Sohail Zia, Fuad Khan Niazi

ABSTRACT

Objective: To assess the Frequency and the types of Posterior Capsular Opacification after extra capsular cataract extraction and posterior chamber intraocular lens (PMMA) implantation.

Study Design: Descriptive study

Place and Duration of Study: Department of Ophthalmology Holy Family Hospital, Rawalpindi from May 2003 to May 2005.

Materials and Methods: Two hundred patients, with age ranges from 55 to 80 years, having uncomplicated senile mature cataracts who underwent ECCE with PCIOL over a period of one year were selected for the study. At 6th Month post operatively the patients were examined for any evidence of posterior capsular opacification within the type and the results were analyzed.

Results: At 6 months follow up 70 patients (35%) developed posterior capsular opacification. Out of these 70 patients, 40 patients (57%) showed capsular fibrosis and 30 patients (43 %) Elsching pearls.

Conclusion: Our study revealed that the occurrence of posterior capsular opacification with PMMA intra ocular lens is high leading to significant number of patients with visually disabling complication in the post operative period.

Key words: Cataract, Posterior capsular opacification, intraocular lens, Elsching pearls

Introduction

Cataract is the leading cause of reversible blindness in the world. Statistics suggests that there are ten million blinds in the world today. The current global estimate indicates that blindness from cataract affects near 18 million people. 4% of the world's blind population lives in Pakistan; 80% of which is avoidable.

Currently the only treatment available for cataract is surgery. In the past intra capsular cataract extraction (ICCE), which is the complete removal of the cataractous lens with its capsule, was the preferred technique available. Now this has been totally replaced by extra capsular cataract extraction in which posterior capsule is left behind so that a posterior chamber intraocular lens can be implanted. Most recently phacoemulsification with intracocular lens implantation has become the operation of choice. Phacoemulsification is the method of choice in developed countries. In the developing countries like Pakistan extra capsular cataract extraction with posterior chamber intraocular lens implantation is the operation most commonly performed mainly because of non-availability of phaco facilities, high cost and less experienced phaco surgeons. Posterior capsular opacification or “after cataract” is the most common complication of cataract surgery. Many studies have been documented in international literature regarding the incidence of posterior capsular opacification. Local research in this aspect is limited. So we present a prospective study to determine the frequency and types of posterior capsular opacification occurring after cataract extraction with posterior chamber intraocular lens implantation in our local population.

Materials and Methods

This prospective study with non-probability convenient sampling was conducted in the Eye Department, Holy Family Hospital, Rawalpindi from May 2003 to May 2005. Two hundred patients, with age
ranges from 55 to 80 years, having uncomplicated senile mature cataracts were selected for the study.

Patients were admitted and the need for the operation with its advantages and implications were explained carefully to the patients and only after this knowledge the patients signed the consent form. Complete preoperative evaluation was done and patients found to have any other ocular morbidity were excluded.

**Operative Procedure:** All the cases were operated by the single surgeon having expertise in the technique. 5% povidone iodine was instilled in the conjunctival sac after local injection. The conjunctiva was undermined and bleeding vessels were gently electrically cauterized. First a partial thickness vertical 7 - 7.5mm corneoscleral incision was given with surgical blade no. 15, 1mm behind the limbal blue line. Then a horizontal incision was given in the bed of the first incision to make a stepped wound. The wound was deepened temporarily for point of entry into the anterior chamber. A canopener capsulotomy was made with the help of a cystitome after filling anterior chamber with a viscoelastic substance. Then the wound was opened with the corneal scissors along the incision line. The nucleus was expressed by pressure and counter-pressure technique with wire vectus and squint hook. The remaining lens matter was removed using Simcoe Irrigation/aspiration canula. The viscoelastic substance was injected and posterior chamber PMMA intraocular lens of 6.5 diameters was implanted. The wound was closed using 10/0 monofilament nylon sutures and the viscoelastic substance was replaced by ringer lactate irrigation. A subconjunctival injection of antibiotic/steroid was given and the eye was padded for 24 hours. To deal with any intra operative complications the surgical technique was modified accordingly. The data was entered on statistical package for social sciences (SPSS) version 13.0 and the results were calculated in frequencies.

Patients having surgical complications like posterior capsular rent with or without vitreous loss were excluded. At 6th month post operatively the patients were examined for any evidence of posterior capsular opacification with its type and the results were analyzed.

**Results**

A total of 200 patients were included in the study, within the age group 55 to 80 years, mean age was 62 years with standard deviation of 10.20. Out of the total number of patients, 116 (58%) were male and 84 (42%) were female. Our study revealed that at 6 months follow up 70 patients (35%) developed posterior capsular opacification. Out of these 70 patients, 40 patients (57%) showed capsular fibrosis and 30 patients (43%) showed Elschpig pearls.

**Discussion**

Posterior capsule opacification (PCO) is the most common complication after cataract surgery leading to reduced vision.

<table>
<thead>
<tr>
<th>Table I: No of patients with PCO at 6 months follow up(n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of Patients Operared</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>
Table II: Type of PCO in patients

<table>
<thead>
<tr>
<th>Patients with PCO</th>
<th>Elschnig Pearls</th>
<th>Capsular Fibrosis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21(30%)</td>
<td>27(38.5%)</td>
<td>48</td>
</tr>
<tr>
<td>Female</td>
<td>9(13%)</td>
<td>13(18.5%)</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>30(43%)</td>
<td>40(57%)</td>
<td>70</td>
</tr>
</tbody>
</table>

postoperatively. PCO, the term itself is not correct. It is not the capsule that undergoes opacification rather it is the attempt of the lens material to form a new lens by proliferation.

Two types encountered most commonly are:

**The capsular fibrosis:** It is formed by the lens epithelial cells which migrate to the posterior capsular surface when anterior capsulotomy is done. The lens epithelial cells undergo transformation into myofibroblasts and then they proliferate into collagen and hence form an opaque fibrous membrane on the posterior capsule.

**Elschnig’s pearls:** These are a proliferation of cells on the outer surface of the capsule. This type of PCO can be several layers thick and are named due to their similar appearance as of bladder cells.

PCO has medical, social and economic implications. Although it is easy to clear the visual axis by Nd YAG laser capsulotomy, if this is available this technique is not without problems and the cost is still prohibitive. Its complications include damage to intraocular lens, intra ocular pressure elevation, cystoid macular edema, retinal detachment, intraocular lens subluxation and localized endophthalmitis exacerbation.

In our study 35% of patients out of 200 developed PCO at six months follow up. Our results are comparable with the study conducted by Sterling and Wood who found that the incidence of PCO after extra capsular cataract extraction with posterior chamber intraocular lens implantation ranged from 19% to 50%. Another study done by Shrestha, Pradhan, and Snellingen, showed that extra capsular cataract extraction even in the best of the surgical hands gives PCO in 10% to 50% of cases. Hollick and co-others, also mention 17% to 46% occurrence of PCO after extra capsular cataract extraction with posterior chamber lens implantation.

According to our study the incidence of capsular fibrosis was 57% and Elschnig pearls 43%. which is contrary to findings of study conducted by Kuasar A et al which shows greater incidence of capsular fibrosis.

There have been multiple modifications in the IOL design, material, type of heptic and surface to prevent PCO. Some researchers recommended sharp-edged and round-edged IOLs. Others suggested lens design like square edge and single piece. Similarly different lens materials have been introduced. Basti and Koraszewska-Matuszewska used heparin surface modified IOLs. Some authors advocated the use of acrylic intraocular lenses instead of PMMA like Rowe Nihalani and Aasuri, who found that the incidence of PCO was lesser in acrylic intraocular lenses. But Pavlovic’s found that hydrophobic acrylic material are associated with a much higher rate of posterior capsule opacification (PCO) than previously thought. Similarly Sushma found that PCO was more common in eyes implanted with acrylic hydrophobic IOLs as compared to silicone IOLs. So the problem persists despite of
modifications in the lens material and design. We used PMMA IOL in order to find the incidence of PCO as it is the most commonly used lens due to cost restrictions. The use of modern IOLs is the costly option and is not applicable in developing countries like ours.

Extensive research is in progress to reduce the incidence of PCO like use of topical heparin eye drops postoperatively. Dexamethasone-coated IOLs that can deliver slow release molecules are also being evaluated. Another new concept is sealed capsule irrigation (SCI), which allows the isolated safe delivery of irrigating solutions containing pharmacological or nonpharmacological agents into the capsular bag following cataract surgery such as 5-fluorouracil. 5-fluorouracil was shown to be successful in preventing PCO in young rabbit eyes and may also prove successful in human eyes.

**Conclusion**

Our study revealed that the occurrence of posterior capsular opacification with PMMA intraocular lens is high leading to significant number of patients with visually disabling complication in the post operative period.

**References**