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Original Article

Posterior polar cataract: Minimizing risks

Col Gaurav Kapoor [a,*], Lt Col Sankalp Seth [b], Maj Gen T.S. Ahluwalia [c], Lt Col S.K. Dhar [d]

[a] Senior Adviser (Ophthalmology), Base Hospital, Delhi Cantt 110010, India
[b] Graded Specialist (Ophthalmology), Military Hospital, Allahabad, UP, India
[c] Commandant, Command Hospital (Eastern Command), Kolkata, India
[d] Classified Specialist (Ophthalmology), Command Hospital (Southern Command), Pune 411040, India

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ABSTRACT

Background: Comparing surgical outcomes of management of posterior polar cataract, a congenital cataract, which is difficult to manage surgically and has been associated with poor surgical outcomes.

Methods: 46 eyes of 38 patients with posterior polar cataract underwent phacoemulsification and PCIOL implantation.

Results: In a prospective analytical study, 46 eyes of 38 patients with posterior polar cataracts underwent surgery at a zonal hospital of the armed forces. The posterior polar cataract incidence was 1.23 per 1000 with confidence interval (CI) of 0.0012. Of the 46 eyes operated, 6 had a posterior capsular rupture (PCR) (13.04%). The PCR incidence in normal cataracts is reported at approx. 1.1%, whereas, various studies have reported incidence of 6–36% in posterior polar cataracts. 41 eyes achieved a visual acuity of 6/12 or better (89.13%) and 39 eyes of 6/9 or better (84.78%). 4 patients had amblyopia (8.6%), Two patients developed macular edema (4.34%). Mean follow-up was 7 months (range 3–11 months). There was no case of nucleus drop or retinal detachment.

Conclusion: Posterior polar cataracts are a surgical challenge. With controlled surgery, well defined techniques, a good surgical outcome can be achieved with reduced incidence of PCR.

Introduction

Posterior polar cataract is a disorder, generally present at birth, which is a dominantly inherited disorder with variable expressivity; however, it can be sporadic and generally manifests at a later age. Dominantly inherited cataracts tend to be bilateral, whereas sporadic ones are generally unilateral. There is a positive family history in 40–55% and it is bilateral in 65–80%.[1] There is no sex predilection. The reported incidence is 3–5 in 1000.[2] Recently, evidence has linked it to a mutation on PITX3, chromosome 10 and 16q22.[3] It is a cataract, which is

* Corresponding author. Tel.: +91 8938801712.
E-mail address: gauast@gmail.com (G. Kapoor).
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situated on the posterior pole of the lens associated with remnants of the tunica vasculosa lentis, an embryologic hyaloid structure that fails to regress.

Duke-Elder has classified it into stationary and progressive forms. The stationary form is a well-circumscribed circular opacity, localized on the central posterior capsule. Progression begins in any decade. In the progressive type, whitish opacification takes place in the posterior cortex in the form of radiating rider opacity. It has feathery and scalloped edges, but they do not involve the nucleus. Both stationary and progressive posterior polar cataracts may become symptomatic.

Singh classified posterior polar cataract into:

Type 1 The posterior polar opacity is associated with posterior subcapsular cataract.

Type 2 Sharply defined round or oval opacity with ringed appearance like an onion with or without grayish spots at the edge.

Type 3 Sharply defined round or oval white opacity with dense white spots at the edge often associated with thin or absent PC. These dense white spots are a diagnostic sign (Daljit Singh sign) of posterior capsule leakage and extreme fragility.

Type 4 Combination of the above 3 types with nuclear sclerosis. Schroeder on the other hand graded posterior polar cataract in his pediatric patients according to its effect on pupillary obstruction in the red reflex testing as follows:

- Grade 1 A small opacity without any effect on the optical quality of the clear part of the lens.
- Grade 2 A two-thirds obstruction without other effect.
- Grade 3 The disk-like opacity in the posterior capsule is surrounded by an area of further optical distortion. Only the dilated pupil shows a clear red reflex surrounding this zone.
- Grade 4 The opacity is totally occlusive; no sufficient red reflex is obtained by dilation of the pupil. It thus interferes with central vision, especially in bright light, when the pupil is constricted.

The posterior polar cataract is tightly adherent to the underlying posterior capsule and often associated with a preexisting posterior capsular dehiscence or a very thin capsule under the plaque (Fig. 1). Because of its predisposition to posterior capsular dehiscence during surgery, it represents a challenge to the surgeon.[4,5] Various studies have reported different rates of capsular dehiscence during surgery, varying from 7.1% to as high as 36%.[2,6] A number of surgical techniques and approaches have been defined for improving surgical outcomes and reducing the rate of complications during surgery.[7–10] The timing of surgery is also of great importance as the risks of early surgery at a younger age have to be balanced with the difficulty of performing the surgery on a harder, more mature, advanced cataract.

Most studies quoted above have examined a number of cases ranging from 25 to 36. In this study, we have performed surgery on 46 eyes of 38 patients and tried to describe a surgical approach, which included manual IA with a Simcoe cannula, which will reduce the complication rate and improve the surgical outcome in these patients.

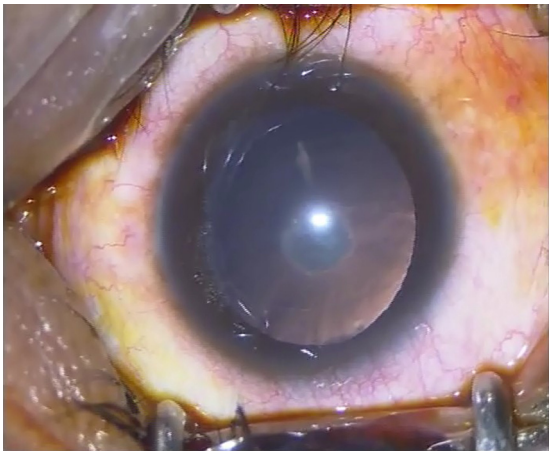

Fig. 1 – Posterior polar cataract.

Materials and methods

In a prospective analytical study of posterior polar cataract, 46 eyes of 38 patients with posterior polar cataract underwent phacoemulsification with posterior chamber intra ocular lens (PCIOL) implantation, over a three-year period, at a zonal hospital of the army. All the patients underwent surgery with a similar technique over a period of three years. The surgical factors of interest were the rate of posterior capsular rupture (PCR), nucleus drop and postoperatively, and the best corrected visual acuity.

All patients were counselled preoperatively and the risks involved were explained to the patient. The possibility of preexisting amblyopia[6] was also explained to the patients. All cases with associated problems such as glaucoma, pterygium, uveitis and nuclear sclerosis greater than grade III were excluded from the study.

Surgery – All patients underwent phacoemulsification surgery under peribulbar anesthesia on a Stellaris phaco machine, a venturi pump based machine. In contrast to routine cases, the following parameters were used during surgery, vacuum – 150–200 mmHg, bottle height – 50–70 cm and power varied from 20 to 30 and vacuum 100 mmHg for epinucleus removal.

A 2.8 mm corneal entry was made at 10 o'clock position and side port at 1 o'clock. The central curvilinear capsulorhexis (CCC) was kept slightly smaller at 5 mm (Fig. 2), to support a sulcus implanted intra ocular lens (IOL) if required. However, in denser cataracts, the CCC was kept larger than 5 mm to prevent rupture during hydro procedures. No hydrodissection was done; only gentle hydrodelineation was done using two or three waves of BSS fluid (Fig. 3). A golden ring indicated successful delineation. No rotation of the nucleus was done and an attempt was made to ensure partial prolapse of the nucleus by hydrodelineation.

Less dense nuclei were emulsified in the bag as a whole and slow controlled chopping was done if the nucleus was grade 2 or grade 2+. To prevent capsular rupture during the phaco