

To evaluate the visual outcome of penetrating keratoplasty in patients with healed microbial corneal lesions

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ABSTRACT

Purpose: To evaluate the visual outcome of penetrating keratoplasty (PKP) in patients with healed microbial corneal lesions. **Material and Methods:** Penetrating keratoplasty alone or triple procedure was performed in 40 eyes of 40 patients with healed microbial corneal lesions. Outcome was evaluated in terms of graft survival and final best corrected visual acuity. **Results:** Out of 40 patients underwent PKP, 72.50% were male and 27.50% female. Mean recipient age was 54.02 years (range 11-80). Indication for PKP was healed microbial corneal lesions, 37.50% were healed bacterial, 32.50% healed fungal and 30% healed viral keratitis patients. PKP alone was performed in 80% patients and 20% patients had triple procedure. Follow up period after surgery was 6 months. Overall graft survival was 67%, final best corrected visual acuity achieved was: >6/60 in 13 cases (32.50%). 9 cases (22.50%) had vision between 6/60-4/60. **Conclusion:** Blindness due to corneal opacity results in significant morbidity both in terms of loss of vision and socio-economic reasons. Penetrating keratoplasty is the only method to visually rehabilitate these patients.

KEYWORDS: Healed microbial corneal lesions, Penetrating keratoplasty, Triple procedure, Visual outcome.

INTRODUCTION

Corneal blindness is the third most common cause of irreversible blindness in India and accounts for 0.9% of all causes of irreversible blindness.¹ Penetrating keratoplasty (PKP) is still performed more frequently in developing countries like India because of requirement of less technical expertise and its cost effectiveness.² It was only in the 1960s, with the development of instruments that allowed routine monitoring of intra ocular pressure (IOP) after PKP, that the problem of post PKP glaucoma was recognized. In 1969, the rise in IOP following PKP was first demonstrated by Irvine and Kaufman.³ Present study was conducted to evaluate the visual outcome of penetrating keratoplasty (PKP) in patients with healed microbial corneal lesions.

MATERIALS AND METHODS

Present study on visual outcome after penetrating keratoplasty consisted of total of 40 post-operative cases from June 2012 to June 2014 of department of Ophthalmology, G.G.S. Medical College, Faridkot, Punjab, INDIA. Effort has been made to identify the common indications leading to penetrating keratoplasty, pre-operative and post-operative factors which develop

glaucoma and the visual prognosis associated with penetrating keratoplasty. Age of the patients belonged up to 70 years. Donor grafts were taken through the Bharat Vikas Parishad Eye Bank, Department of Ophthalmology, G.G.S Medical College, Faridkot. Which have been enucleated within six to eight hours of death of deceased after proper consent from the relatives and preserved by moist chamber method and transplanted within eight to ten hours of collection.

Age, gender, indication of PKP and best corrected visual acuity constituting the preoperative data (Table: 1) were recorded in a predesigned proforma.

The type of procedure defined as PKP alone and triple procedure (PKP combined with an extra capsular cataract extraction and intraocular lens implantation).

Disc evaluation was performed in cases where media was clear and permitted a view of the disc. Visual field analysis could not be done in any patient as vision in all patients was not more than or equal to 6/18 and therefore, intraocular pressure was the only criterion for assessing the progress or control of glaucoma.

Post-operative data included the final best corrected visual acuity and complications.

Table 1: Preoperative observations

Condition of the eye		No. of cases (%)
Anterior synechiae	Not present	21(52.50)
	Present	19(47.50)
Vascularisation	Not present	22(55.00)
	Present	18(45.00)
Condition of the lens	Aphakic	5(12.50)
	Cataract	22(55.00)
	Pseudophakia	8(20.00)
Intarocular tension	Normal	5(12.50)
	Normal	29(72.50)
	Raised	10(25.00)
Vision	Low	1(2.50)
	PL+ PR+	8(20.00)
	Hand movements	18(45.00)
	Finger counting at 1 m	14(35.00)
Condition of the other eye	Phthisical	-
	Absolute	7(17.50)
	Enucleated	1(2.50)
	Similar pathology	9(22.50)
	Normal	23(57.50)

Epithelial Defect

■ Present ■ Not Present

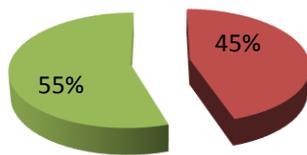


Figure 1: Incidence of epithelial defect

Post PKP Glaucoma

■ Present ■ Not Present

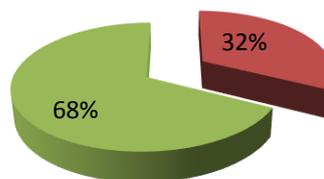


Figure2: Incidence of glaucoma after PKP

Allograft Reaction

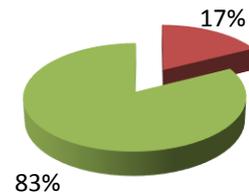


Figure3: Allograft reaction

Final improvement in vision

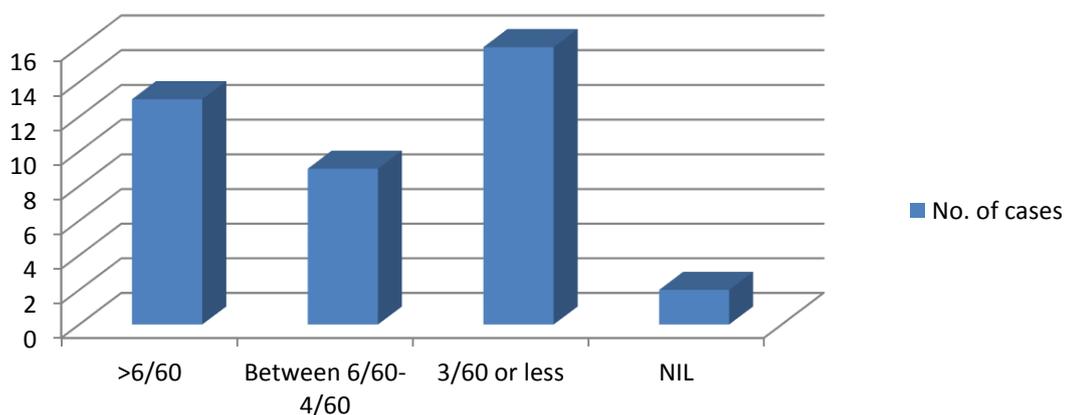


Figure4: Final improvement in vision

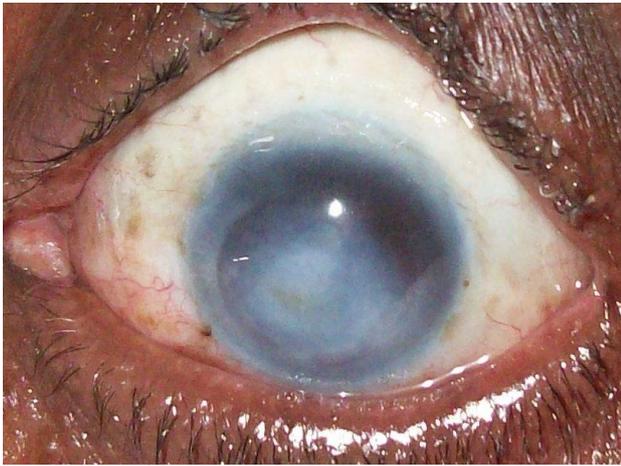


Fig 5: Healed viral keratitis

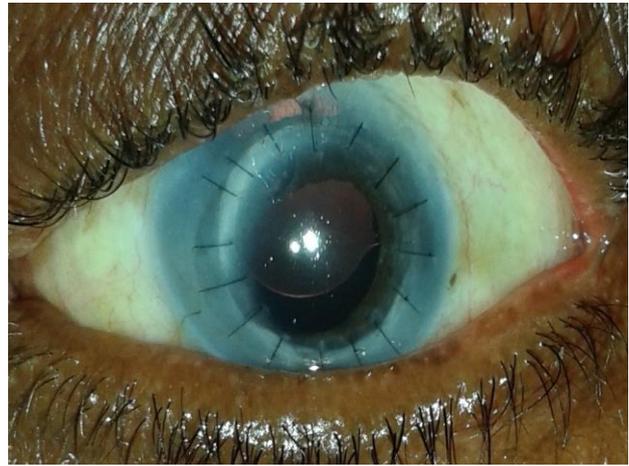


Fig 6: 6 months after PKP. The graft survived successfully.

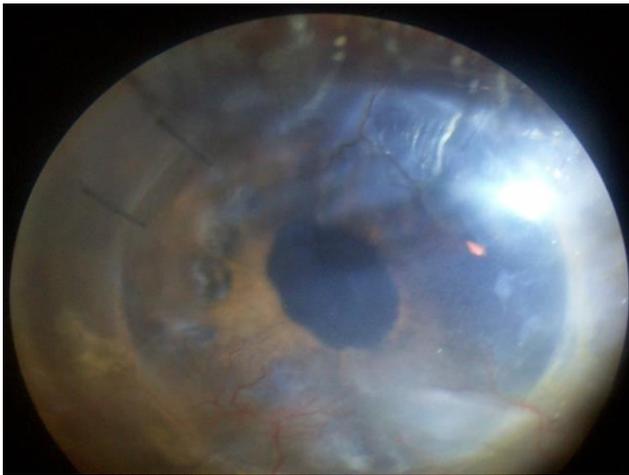


Fig 7: Postoperative picture at 3 weeks showing early graft rejection



Fig 8: Postoperative picture of the patient at 6 months with 6/18 vision

RESULTS

Most of the patients were between 51-60 years of age group (30%). Mean recipient age was 54.02 years (range 11-80). Out of 40 cases, 29 (72.5%) were males and 11 (27.5%) were females. Out of the 13 patients who developed glaucoma at 6 month follow up, 7 patients (53.84%) were in 41-60 years of age group. Out of 13 cases 10 (76.92%) were males and 3 (23.07%) were females. Indication for PKP was healed microbial corneal lesions, 37.50% were healed bacterial, 32.50 % healed fungal and 30% healed viral keratitis

Preoperative best corrected visual acuity in 14 patients was 1/60, in 18 patients HMCF and in 8 patients PL+ PR accurate. PKP alone was performed in 32(80%) patients and 8(20%) patients had triple procedure. Follow up period after surgery was 6 months.

Overall graft survival was 67%, final best corrected visual acuity achieved was: >6/60 in 13 cases (32.50%). 9 cases (22.50%) had vision between 6/60-4/60. 16 cases (40.00%) had vision of 3/60 or less. While in 2 cases (5.00%) there was no vision at the end of follow up.

Complications encountered in patients were, early clouding of graft in 2(5%)cases, epithelial defect in 18(45%)cases, raised tension in 13(32.50%) cases, allograft reaction in 7(17.50%) cases, recurrence of host

disease in 2(5%) cases, phthisis bulbi in 1(2.50%) case and infection in 2(5%) cases.

DISCUSSION

Penetrating keratoplasty is an effective treatment for corneal diseases with poor vision. The outcome of PKP depends upon indication, method of donor cornea preservation, operative techniques and postoperative care.

PKP alone was performed in 80% patients and 20% patients had triple procedure in our series. Comparing graft survival and final visual acuity between studies is difficult due to difference in population size and follow-up time. However; overall graft survival was 65 % at the final follow-up (mean 13 months), compared with 64% at the last follow-up (mean 21.9 months) reported by Randleman JB² and 76% at one year reported by Wiggins RE³.

Final best-corrected visual acuity(Figure: 4) achieved was: >6/60 in 13 cases (32.50%). 9 cases (22.50%) had vision between 6/60-4/60. 16 cases (40.00%) had vision of 3/60 or worse, comparable to study by Doren GS⁴ (>6/60 in 51%) and Rao SK⁵ (>6/60 in 50%). 20% patients underwent triple procedure and 62.5% patients

had achieved final visual outcome of >6/60. Studies done by Lindstrom RL⁶ and Hunkeler JD⁷ found visual improvement in case of triple procedure 61% and 89% respectively.

PKP are sometimes beset by various complications. Epithelial defect (Figure: 1) and post PKP glaucoma (Figure: 2) were most frequent in our study. Epithelial defect (45%) corresponds to the study done by Kim T⁸ (45%). The post-operative defect in epithelial layer may occur because of loss of epithelium during donor cornea storage, intraoperative trauma or any kind of minute trauma during postoperative period, tear film abnormalities, ocular surface disorders or effect of medicines (specially with preservatives).

Post PKP glaucoma encountered in 32.5% cases which was more than study done by Foulks GN⁹ (18%). High incidence of glaucoma is due to preoperative raised tension, vascularisation, anterior synechiae and also due to post-operative shallow anterior chamber which results in peripheral anterior synechiae formation.

Allograft reaction was seen in 17.5% cases (Figure: 3) which are close to the study done by Hoffman F¹⁰ (20%) and Jiraskova N¹¹ (23%). Vascularization was the most important risk factor found postoperatively in all cases of allograft reaction.

Post PKP infection was seen in 5% cases same as study by Wagnor MD¹² (4.9%) and Hood CT¹³ (5.33%). Suture related infection was the most common cause of corneal infection in patients of PKP.

5% patients had recurrence of herpes simplex keratitis in donor graft. Patient were put on topical and oral Acyclovir 400mg BD for one year, one patient had final improvement in vision. Other complications encountered were: early clouding of graft, pthisis bulbi which are also reported in literature.

Our study showed 55% final improvement of vision (>3/60), thus PKP is the only way to provide some useful vision to patients with healed microbial corneal lesions so that they can perform their day to day activity. Similar studies in future will help in developing better understanding about the outcome of PKP in developing countries like India.

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