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INDICATION AND VISUAL OUTCOME OF THERAPEUTIC KERATOPLASTY IN SOUTHERN ODISHA

Ophthalmology

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ABSTRACT

Purpose: A retrospective study of patients at MKCG MCH,ODISHA , to determine the indication and visual results of therapeutic penetrating keratoplasty (PK) and its role in the management of corneal disease.

Methods: Therapeutic PK was performed in 104patients (104 eyes) who had non healing corneal ulcer ,corneal perforation ,impending corneal perforation,non healing corneal ulcer.

Duration-April 2012-June 2017

Results : Most common indication was non healing corneal ulcer.Anatomical integrity was achieved in 101 of the 104 eyes (97.1%). 22 obtained a final visual acuity of 20/200 or better; five of these eyes were not yet perforated before the PK.

Conclusions: Therapeutic PK is effective in the management of the eye with active uncontrolled infection or perforation from corneal disease. Approximately 40% our patients maintained a clear graft at the last visit. Without therapeutic surgery, these eyes would have been lost.

KEYWORDS

Introduction

The primary purpose of therapeutic penetrating keratoplasty (PK) is to restore the structural integrity of the eye or to resolve infectious or inflammatory keratitis that is refractory to conventional medical therapy, and often both these indications are present.(1,2) Penetrating keratoplasty is the final therapeutic option in the management of refractory corneal disease after conventional medical therapy fails to prevent corneal perforation.In previous years,therapeutic PK was discouraged in cases with corneal perforation, because of the many complications.(3)On the other hand, in cases treated by tissue adhesives, repeated applications may be required(,4,5) and infectious keratitis can occur at the site where adhesives are applied.(4,6)With the improvement of surgical techniques in penetrating keratoplasty in recent years, therapeutic PK has become an increasingly successful method for managing corneal perforation and refractory corneal inflammation.(7,8) This paper aims to determine the anatomical and visual results of therapeutic PK and its role in the management of corneal diseases.

MATERIALS AND METHODS

A retrospective study was made of patients who underwent therapeutic PK over the past 5 years . at MKCG MCH ODISHA.Patients with less than 1 year of follow-up were excluded from the study. Indications for TPK included corneal perforation due to an active corneal disease, non healing infective corneal ulcer,traumatic corneal perforation and corneal melting due to chemical injury. Data obtained from the records were evaluated for each of the following criteria:initial indication for grafting, length of follow-up,size of donor button and recipient bed, anatomical integrity of the eye,cure of disease,graft clarity, and visual acuity. The infection was considered cured if there was no evidence of corneal infiltration suggestive of infection for 1 month after the PK.1

In all patients with the clinical diagnosis of microbial keratitis in the graft,after administering topical anesthesia, corneal scrapings were obtained from peripheral and central areas of the corneal ulcer with a Kimura spatula. Slides were stained with Gram and Giemsa stains, and the corneal scrapings were cultured. Routine antibiotic sensitivity testing was performed on all isolates using the disk diffusion test. Topical fortified broad-spectrum antibiotic therapy including cephazoline or vancomycin (50mg/ml) and tobramycin or gentamycin (14mg/ml) was begun immediately after obtaining the microbiological specimens. Subconjunctival or systemic antibiotic therapy was added when indicated.Therapy was modified according to the results of the microbiological examinations.

In all cases, donor tissue had been removed within 6h of death and stored in the storage medium Donor buttons had been punched from the endothelial side, 0.25–0.50mm larger than the trephine size. The graft size was less than 8mm in 35 eyes, and 8.5mm in one eye. The graft was sutured in place using 10-0 monofilament continuous or interrupted suture. Interrupted suture was preferred where there was certain corneal vascularization. Viscoelastic substance was used in all cases to remove peripheral anterior synechia and to avoid damage to the lens and the iris. In most cases, we preferred not to remove the crystalline lens unless there was an intumescent cataract; however, intraocular lens implants were removed if necessary. A large open-sky vitrectomy was performed for the aphakic patients . .A subconjunctival injection of steroid andantibiotic was given to all patients at the completion of the surgery. All patients received postoperative topical steroids for 1 year.The dosage of steroids was individualized according to each patient's clinical course. Systemic steroids (1mg/kg per day) were routinely administered for 2–4 weeks postoperatively in patients who had perforated corneas before the PK, and were gradually tapered in dose. Antibacterial therapy was maintained for the postoperative 2 weeks in patients with bacterial keratitis.Oral acyclovir in a prophylactic dose of 400mg twice a day for at least 12 months after surgery was given in all cases of herpetic keratitis. Topical antivirals were used for recurrent dendritic keratitis and also for prophylaxis during high-dose topical steroid therapy for episodes of graft rejection.Antiglaucoma medications and artificial tears were used as required.

The results were evaluated according to the following criteria: anatomical integrity of the eye,cure of the disease, complications, graft clarity, and visual acuity.

Results

Therapeutic PK was performed in a total of 104 patients (104 eyes). Of these,34 eyes had perforated because of corneal disease, and perforation had not occurred in the remaining 70 eyes.There were 81 male patients (77.8%) and 23 female patients (22%).The mean age was 51year.

TABLE -1 INDICATION AND VISUAL OUTCOME OF TPK

INDICATION	NUMBER	PERCENTAGE
Perforated corneal ulcer	34	32
Non-healing bacterial corneal ulcer	21	21
Non-healing fungal corneal ulcer	36	36
Non-healing viral corneal ulcer	7	7
Non-healing mixed corneal ulcer	2	2
Traumatic corneal perforation	2	2
Chemical injury	2	2

TABLE 2 POST OP COMPLICATION

POST OP COMPLICATION	NUMBER	PERCENTAGE
Peripheral anterior synechia	56	56
Glaucoma	43	43
Graft rejection	23	23
Retinal detachment	8	8
Cytoid macular oedema	3	3
Endophthalmitis	2	2

TABLE -3-VISUAL ACUITY POST OPERATIVELY

Visual acuity(snellen)	Number	Percentage
Same as preop	65	62.4%
>=20/200	15	16.3%

The indication for therapeutic PK has been shown in Table no-1.The proportion of clear grafts was 40.3% (42. Best-corrected visual acuity at the last visit to our clinic are shown in Table 3. Fifteen eyes (16.3%) achieved a final visual acuity of 20/100 or better, five of which had not yet perforated before the PK. Complications leading to reduction in vision despite the clear graft included retinal detachment (eight eyes), glaucomatous optic nerve damage (two eyes), and cystoid macular edema (three eyes).

Discussion

When corneal infection does not respond to medical therapy, the only remaining option for treatment may be surgical excision of the infected tissue and replacement with a donor cornea. Despite recent advances in the medical management of infectious keratitis, certain subgroups of bacteria, fungi, parasites, or viruses do not respond to antimicrobial therapy.2,9,10 Therapeutic keratoplasty offers surgical debridement of an infectious process. If there is active infection but perforation has not occurred, keratoplasty is undertaken because perforation is threatened. Corneal perforation, which dramatically increases the risk of endophthalmitis and infectious scleritis, should be avoided because of the severe morbidity of this condition.2–11 Therapeutic PK was effective in all cases with bacterial keratitis.We observed recurrent HSV keratitis in one eye. The earliest recurrence occurred at the postoperative third month in herpetic keratitis patient. Success of the keratoplasty depended on the degree of inflammation, the presence of neovascularization, use of fine sutures, and the use of high doses of topical and systemic steroids and antiviral therapy in the immediate postoperative period.

In cases of active uncontrolled infection or noninfected perforation, the indications for PK were primarily to preserve the globe. In this study, anatomical integrity was achieved in the early postoperative period. When perforation is imminent, there is no advantage in waiting until an eye has perforated before proceeding to keratoplasty.With an unperforated eye,the surgery may be technically easier and the angle may be better protected from peripheral synechia formation. When perforation occurs, this leads to greater risk of refractory glaucoma and endophthalmitis. In this study,endophthalmitis was seen in two of the cases after the PK.Glaucoma was a common problem in 43 eyes, 37 of which had perforated before the PK. The formation of anterior synechiae was the most important cause of glaucoma.Viscoelastic delamination was also helpful in releasing the angle and may reduce the formation of anterior synechiae. The severity of ocular inflammation at the time of surgery had a direct impact on graft survival. In all of the emergency grafts, there was considerable intraocular inflammation.Active inflammation increased the risk of the development of anterior synechiae, glaucoma, cornealneovascul arization,and graft rejection.Although eradication of the corneal infection is paramount, control of the inflammation is also important.2 This inflammation can progress to donor cornea melting, vascularization, and allograft rejection.In this series,graft rejection was seen in 23 eyes(22.3%).

Whereas visual restoration is the primary goal of optical PK,visual rehabilitation is of secondary importance in therapeutic PK.Visual rehabilitation,if necessary,can always be accomplished later under more controlled circumstances. Fifteen eyes (16.3%) achieved a final visual acuity of 20/200 or better,with refraction.Of these,ten eyes were perforated before the PK. Therapeutic PK is technically difficult in eyes perforated prior to the operation.

The risk of post-PK glaucoma andendophthalmitis is also higher in perforated eyes.We think that the success rate of the operation is improved by the control of the inflammation with systemic steroids and careful postoperative monitoring for the development of glaucoma or endophthalmitis.Therapeutic penetrating keratoplasty is generally an emergency, high-risk procedure. It requires meticulous attention to detail and careful postoperative monitoring. Nevertheless, advances in microsurgical technique, antimicrobial therapy, and control of inflammation have resulted in an improved prognosis for therapeutic keratoplasty.

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