ORIGINAL RESEARCH PAPER

Ophthalomology

KEY WORDS: Penetrating Keratoplasty, Therapeutic Keratoplasty, Graft Survival, Postoperative Graft Rejection.

THE CORNEAL REBIRTH: INSIGHTS IN TRANSPLANT SURGERY

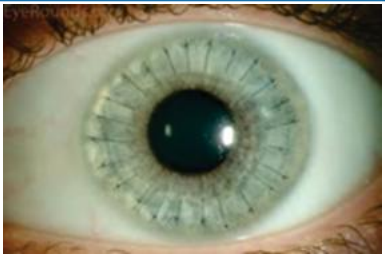
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ABSTRACT

Purpose: To evaluate the indications, visual outcomes and postoperative complications of penetrating keratoplasty (PK) in patients presenting to a tertiary care hospital. **Methods:** This retrospective observational study included 70 eyes undergoing penetrating keratoplasty. Indications were categorized as infectious keratitis, perforated corneal ulcers, failed graft, adherent leucoma, corneal ectasias, pseudophakic bullous keratopathy, post-traumatic corneal opacities and others. Surgical procedures included optical, therapeutic and tectonic keratoplasty. Best-corrected visual acuity (BCVA), surgical outcomes and postoperative complications were assessed at 1, 3 and 6 months following surgery. **Results:** Infectious keratitis was the most common indication for PK (25/70 eyes; 35.7%), followed by failed graft (11 eyes; 15.7%), keratoconus/keratoglobus and post-traumatic corneal opacity (9 eyes each; 12.9%). Overall, 37 eyes (52.85%) demonstrated improvement in BCVA at the last follow-up. Visual improvement was observed in 83.3% of eyes undergoing optical keratoplasty, compared to 28.5% and 36.84% following therapeutic and tectonic keratoplasty, respectively. Graft rejection was the most common postoperative complication (18.5%), followed by glaucoma/ocular hypertension (5.5%), graft melting (4.2%), evisceration (4.2%) and reinfection (2.8%). Surgical failure was observed in 35.71% of cases. **Conclusion:** Penetrating keratoplasty remains an important intervention for visual rehabilitation and restoration of anatomical integrity in patients with diverse corneal pathologies. Optical keratoplasty offers comparatively better visual outcomes, whereas therapeutic and tectonic procedures primarily aim to eradicate infection and preserve globe integrity. Graft rejection remains a major cause of surgical failure. Early intervention and appropriate case selection may help improve outcomes.



Clinical Photograph of a Corneal Graft With Sutures

INTRODUCTION

Corneal blindness forms a significant proportion of visual blindness in developing countries, and penetrating keratoplasty (PK) can restore vision or deteriorate infections for the same. The prognosis is dependent on the corneal diseases responsible for blindness. [1]

Penetrating keratoplasty (PKP) is a technique of performing full-thickness corneal transplantation where a diseased cornea is removed and replaced with a healthy and viable donor corneal button. [1]

The types of keratoplasty include optical, therapeutic and tectonic keratoplasty. Optical penetrating keratoplasty (OPK) is done for the purpose of visual regain. The main goal of the surgical treatment in therapeutic and tectonic keratoplasty (TPK) is the total removal of the infected or destroyed cornea and restoration of ocular integrity respectively. [2]

Aim and Objective

To evaluate the indications, visual outcomes and complications of PK in patients at a Tertiary Care Hospital.



Clinical Photographs of Corneal Grafts (Panels A and B)

METHODS

The patients were initially analysed for the indications of PK, which included the following categories: infectious keratitis, perforated corneal ulcers, failed graft, adherent leucoma, corneal ectasias, pseudophakic bullous keratopathy, post-traumatic corneal opacities, and others.

The surgical techniques included optical, therapeutic and tectonic keratoplasty. An analysis of the surgical outcomes, visual outcomes and complications was reviewed at 1 month, 3 months and 6 months post-surgery.

The complications were divided as follows: graft rejection, graft melting, glaucoma/ocular hypertension, reinfection and eyes needing evisceration.

RESULTS AND DISCUSSION

Indications

Infective keratitis was the most common indication (25 of 70 eyes), followed by failed graft (11 eyes). Keratoconus/keratoglobus and post-traumatic corneal opacity accounted for 9 eyes each.

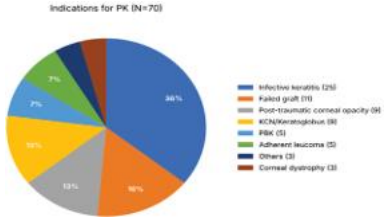


Figure 1. Indications for Penetrating Keratoplasty (Number of Eyes, N=70)

Visual Outcomes

Best-corrected Visual Acuity (BCVA) Before Surgery and at Follow-up (N=70):

BCVA	Pre-op (number of cases)	At 3 months post-op	At 6 months post-op (last follow-up)

<CF@1M	52	44	40 (57%)
6/60 – CF@1M	17	14	17 (24%)
>6/60	1	12	13 (18%)

CF = Counting Fingers

Improvement in BCVA According to Type of Keratoplasty

Type of PK (N)	Improvement in BCVA (N) (%)
OPK (30)	25 cases (83.3%)
Therapeutic PK (21)	6 cases (28.5%)
Tectonic PK (19)	7 cases (36.84%)

Post-operative Complications / Causes of Surgical Failure

Graft rejection was the most common complication (18.5%), followed by glaucoma/ocular hypertension (5.5%), graft melting (4.2%), eyes needing evisceration (4.2%) and reinfection (2.8%).

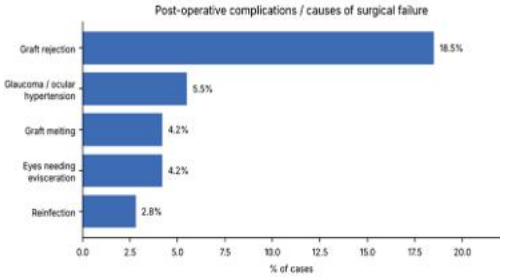


Figure 2. Post-operative Complications / Causes of Surgical Failure (% of Cases)

Summary of Findings

- Most common indication: infectious keratitis (34%), followed by failed graft (15%).
- Visual outcome improved in 37 cases (52.85%).
- No improvement or deterioration in 33 cases (47.14%).
- Surgical treatment failure: 25 cases (35.71%).
- Most common cause of failure: graft rejection, in 18.5% of cases.

PK can visually rehabilitate corneally blind patients with various corneal pathologies. Its prognosis and outcome depend on the pathology responsible for corneal blindness. [3] In our study, we found that:

- Infective keratitis was the common component, being the most common indication in both optical and therapeutic graft surgeries.
- Improvement in visual outcome is better in cases of optical keratoplasty, while deterioration of infections and anatomical integrity of the globe does not guarantee improvement of vision.
- Graft rejection is the most common cause of graft failure.

CONCLUSION

- Therapeutic PK and tectonic PK achieve anatomic success and are useful procedures for restoring a stable cornea where infection fails to heal or the cornea perforates.
- The visual outcome following corneal transplantation was encouraging in cases of optical keratoplasty; it was poor in therapeutic and tectonic keratoplasty.
- Better outcomes may be achieved with early intervention.

Limitations

Donor details such as age of donor, cause of death of donor, death-to-enucleation time and death-to-preservation time of donor tissue, which can affect graft survival, were not analysed.

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