



**PROGNOSIS OF THERAPEUTIC PENETRATIVE
KERATOPLASTY FOR FUNGAL KERATITIS DEPENDING
ON CORNEAL GRAFT DIAMETER**

Dr. Dilip Kumre MD¹, Dr. Saket Benurwar MD (STD)², Dr. Nilesh K Tumram MD^{3*}

¹Associate Professor, Department of Ophthalmology, Government Medical College, Nagpur,
Maharashtra, India-440003

²Junior Resident, Department of Ophthalmology, Government Medical College, Nagpur,
Maharashtra, India-440003

³Assistant Professor, Department of Forensic Medicine, Government Medical College,
Nagpur, Maharashtra, India-440003

Article Received on 17/03/2015

Article Revised on 08/04/2015

Article Accepted on 29/04/2015

***Correspondence for
Author**

Dr. Nilesh K Tumram

Assistant Professor,
Department Of Forensic
Medicine, Government
Medical College, Nagpur,
Maharashtra, India-440003.

ABSTRACT

Fungal keratitis is a severe cause of blindness in most developing countries, and it has become the leading cause of the infectious keratitis in most areas of India. The present study mainly observed the follow-up results of patients with fungal keratitis who underwent PKP and compared the postoperative visual acuity and complications between patients whose corneal graft diameter was 8.00mm or larger and whose graft diameter smaller than 8.00mm. the study concludes

that PK is effective treatment approach for fungal keratitis, there is higher incidence of graft rejection & secondary glaucoma in large diameter PK for fungal keratitis and early diagnosis & early PK with smaller diameter graft can improve prognosis in fungal keratitis.

KEYWORDS: Fungal Keratitis; Blindness; Penetrative Keratoplasty; Corneal Graft.

INTRODUCTION

Fungal keratitis is a severe cause of blindness in most developing countries, and it has become the leading cause of the infectious keratitis in most areas of India.^[1,2] Most patients have a history of misdiagnosis and extensive application of broad-spectrum antibiotic and glucocorticoid which may result in a prolonged course, when penetrating keratoplasty (PKP)

of large size graft is needed to preserve the eyeballs.^[3] The diameter of the corneal grafts is decided by the size of ulcerations, and there were no detailed reports on therapeutic effect of patients using different size of corneal grafts. The present study mainly observed the follow-up results of patients with fungal keratitis who underwent PKP and compared the postoperative visual acuity and complications between patients whose corneal graft diameter was 8.00mm or larger and whose graft diameter smaller than 8.00mm.^[8]

MATERIALS &METHODS

Retrospective study: Total of 50 patients suffering from fungal keratitis underwent therapeutic penetrating keratoplasty (PK) at tertiary care centre in central India from June 2011 to May 2012. They were divided into two groups A & B according to corneal graft diameter. Group A- 25 eyes, corneal graft diameter 8.01mm-10mm. Group B- 25 eyes, graft diameter 6.00mm-8.00mm.

INCLUSION CRITERIA

Diagnosis of fungal keratitis was based on

- History & clinical features
- Identification of fungal elements or growth in fungal culture from corneal scraping.

INDICATIONS FOR SURGERY

- The size of ulceration was over 6mm
- Depth of ulceration reached deep stromal matrix
- No significant effect to appropriate topical and systematic antifungal treatment after usage for 96 hours.

EXCLUSION CRITERIA

- Secondary glaucoma prior to surgery
- Perforation before surgery

There was no statistical difference in the area of newly developed corneal vessels (neovascularisation) between the patients of two groups

SURGERY

Donor cornea's were preserved in MK (McCarey-Kaufman) media. All operations were performed by one experienced surgeon. Corneal lesions were excised by trephines which were 0.50-1.00mm larger than the diameter of ulcerations. The excised corneal buttons were

submitted to microbiological cultivation & histopathological examinations. Corneal grafts were 0.50mm larger than graft bed.

Tropic amide was used for dilating pupils. Antifungal eye drops were used for about 3 months after surgery. Sutures were dermaled out 6 months after surgery or when suture loosening or new vessels entering.

Follow-up time was 1 year. Post-operative visual acuity, recurrence of infection, secondary glaucoma & Graft failure rate was documented in both groups.

Prognostic factors & Complications

1) Diagnosis and treatment of recurrent fungal infection

Recurrent fungal infection was diagnosed by infiltration of graft bed or corneal graft and new A/C hypopyon formation.

Treatment was topical & systemic antifungal drugs. Secondary PKp was performed in resistant cases.

2) Graft rejection^[4]

Graft rejection was of 2 types :- Epithelial & Endothelial

Graft rejection was treated with glucocorticoids and cyclosporine A eye drops topically.

Severe rejection was given subconjunctival injection and oral glucocorticoids.

3) Diagnosis and treatment of secondary glaucoma^[5]

The diagnosis of glaucoma after penetrating keratoplasty was based on intraocular pressure (IOP) in the early post-operative period and IOP, optic disk changes, and progressive visual field changes in the late post-operative period.^[6]

The development of glaucoma was defined as an increase of IOP above 21mmHg and who required the introduction of anti-glaucoma therapy (medical or surgical).

4) Graft Transparency

RESULTS AND DISCUSSION

4 (16%) cases in group A & 3 cases (12%) in group B had recurrent fungal infection of which 3 cases in group A & 2 cases in group B were cured by antifungal medical treatment while 1 case in each group required secondary PKp. There was no statistical difference in the incidence of recurrent fungal infection ($P=0.541$).

Graft rejection was seen in 10 (40%) cases in group A & 4 (16%) cases in group B. The difference in the incidence of graft rejection in the two groups was statistically significant ($p = 0.006$)^[7]

Secondary glaucoma developed in 4 cases in group A & 1 case in group B. The difference in incidence of secondary glaucoma between groups A & B was statistically significant ($P = 0.016$).

14 cases in Group A had clear corneal graft at 1 year f/u. 16 cases in Group B had clear corneal graft at 1 year f/u. There was no statistical difference in the rate of clear corneal graft i.e corneal transparency ($p = 0.662$)

In our study there was no statistical difference in postoperative corneal graft transparency ($P=0.662$) or incidence of recurrent fungal infection ($P=0.541$) between two groups

Graft rejection & development of secondary glaucoma were significantly higher in Group A with larger diameter graft.

Between 1 week to 3 months graft rejection was both epithelial & endothelial while after 3 months graft rejection was mainly endothelial.^[10]

Table 1: Patients demography

	Group A	Group B
Age(years)	34-76	39-72
Sex	16M, 9F	15M,10F

Table 2: Area of neovascularisation

	Area of neo-vascularisation
GROUP A	8.11 +/- 3.51 % (2.15 – 15.95)
Group B	7.97 +/- 3.40 % (2.01 – 15.80)

Table 3: Comparison of corneal graft rejection

Type	Corneal graft diameter 8.01 – 10.00mm (Group A)		Corneal graft diameter 6.00 – 8.00mm (Group B)	
	1 week – 3 months	3months – 1 year	1 week – 3 months	3months – 1 year
Epithelial immune rejection	3	0	1	0
Endothelial immune rejection	3	4	1	2
Total	6	4	2	2

CONCLUSION

- PK is effective treatment approach for fungal keratitis.
- There is higher incidence of graft rejection & secondary glaucoma in large diameter PK for fungal keratitis.
- Early diagnosis & early PK with smaller diameter graft can improve prognosis in fungal keratitis

REFERENCES

1. Wang M, Zhao GQ, Pan SX, Zhang LL, Liu KX. Epidemiological analysis of 243 cases of keratoplasty. *IntJophthalmol (Guoji YankeZazhi)* 2008; 8(9): 1924–1925.
2. Zhong WX, Sun SY, Zhao J, Shi WY, Xie LX. Retrospective study of suppurative keratitis in 1054 patients, *Zhonghua YankeZaZhi*. 2007; 43(3): 245–250.
3. Xie LX, Zhai HL. Penetrating keratoplasty for treatment of fungal keratitis with corneal perforation. *Zhonghua YankeZaZhi*. 2005.
4. Tham VM, Abbott RL. Corneal graft rejection: recent updates. *IntOphthalmolClin*. 2002
5. Ayyala RS. Penetrating keratoplasty and glaucoma. *SurvOphthalmol*. 2000.
6. França ET, Arcieri ES, Arcieri RS, Rocha FJ. A study of glaucoma after penetrating keratoplasty. *Cornea*, 2002.
7. Chong EM, Dana MR. Graft failure IV. Immunologic mechanisms of corneal transplant rejection. *IntOphthalmol*.
8. Rahman I, Carley F, Hillarby C, Brahma A, Tullo AB. Penetrating keratoplasty: indications, outcomes and complications. *Eye (Lond)* 2009.
9. Shi WY, Wang X, Xie LX. Clinical study on the endothelial immune rejection after penetratingkeratoplasty. *Zhonghua YankeZaZhi*. 2005.
10. Claerhout I, Beele H, Kestelyn P. Graft failure I: Endothelial cell loss. *IntOphthalmol*. 2008.