

Comment on the Article: Outcomes of Therapeutic Keratoplasty in Cases of Refractory Infectious Keratitis

Dear Editor,

This communication is a continuation of the article titled “Delhi infectious keratitis study: Update on clinico-microbiological profile and outcomes of infectious keratitis” published in the previous edition of your Journal.¹ In the aforementioned article,¹ we had presented the microbiological profile of infectious keratitis along with the antimicrobial sensitivity pattern, and we would like to provide supplemental information about the 157 patients in the study who underwent therapeutic penetrating keratoplasty (TPK), with regard to their anatomical and visual outcomes postsurgery. Out of these 157 patients, 112 (71.34%) were male and 45 (28.66%) were female, and the average age of the patients undergoing TPK was 54.01 years (range, 12–85 years). As already mentioned in the article,¹ corneal button culture yielded bacterial growth in 66 cases (42.04%) and fungal growth in 47 cases (29.94%), and 44 cases (34.65%) yielded no growth.

The impact of keratoplasty was assessed based on the infection control and clarity of the graft. Infection was considered to be cured if there were no infiltrates and the eye was free of infection at the end of 3 months following TPK. A failed graft was one which remained opaque even without any evidence of infection. Based on these outcome measures, the cases were segregated into three categories: (1) infection cured, compact graft; (2) infection cured, failed graft; (3) infection not cured, failed graft. Bacterial keratitis fared relatively better in terms of graft outcome, with 36 cases (54.55%) having a compact

graft with infection cured (Category 1) at the end of 3 months post-TPK [Table 1]. However, Gram-negative cases had a preponderance of cases where the infection was not cured even after a TPK (44.45%). In fungal keratitis, an equal number of cases was seen in Categories 2 and 3 (14 cases each), with there still being a slightly higher number of cases with good outcome post-TPK (19 cases in Category 1).

The majority of cases (96 eyes, 61.15%) underwent a TPK within the 1st week of presentation, but the ones that underwent a delayed TPK after 3 weeks fared slightly better, with 63.64% of cases of the former being in Category 1 versus 42.71% of cases of the latter. Details of vision at presentation and 3 months postsurgery in both the groups, fungal and bacterial, have been elaborated in Table 2. Visual acuity was measured on Snellen's chart, and post-TPK, a total of 25 cases had a vision improvement of >2 lines, while 38 cases had of one line. A postoperative vision gain of >2 lines was seen in 25.76% of cases of bacterial keratitis and 17.02% of cases of fungal keratitis [Table 3]. Chi-square test was applied to determine the significance of visual outcome between bacterial and fungal keratitis where our $P = 0.36$ (not significant at $P < 0.05$), implying no significant difference between the visual outcome of the two groups postsurgery. Each category of visual outcome was also compared for bacterial versus fungal, which was also not found to be statistically significant [Table 3].

Among the recent studies done in India on TPK, some have found a bacterial preponderance while some a fungal; however,

Table 1: Category-wise outcome at 3 months postoperatively and distribution of each type of organism isolated in corneal button culture

Causative organism	Category 1, <i>n</i> (%)	Category 2, <i>n</i> (%)	Category 3, <i>n</i> (%)	Total number of cases, <i>n</i> (%)
Gram-positive bacteria	31 (64.58)	12 (25.00)	5 (10.42)	48 (100)
Gram-negative bacteria	5 (27.78)	5 (27.78)	8 (44.45)	18 (100)
Fungal	19 (40.43)	14 (29.79)	14 (29.79)	47 (100)

n: Number of cases, %: Percentage in each category of a particular type organism from the total number of the same

Table 2: The presenting vision and the vision at 3 months posttherapeutic keratoplasty in each group of organism (bacterial vs. fungal)

Vision on Snellen's	Bacterial		Fungal	
	Preoperative, <i>n</i> (%)	Postoperative, <i>n</i> (%)	Preoperative, <i>n</i> (%)	Postoperative, <i>n</i> (%)
<FC at 3 feet	42 (63.64)	20 (30.30)	31 (65.96)	22 (46.81)
20/200-FC at 3 feet	20 (30.30)	23 (34.85)	14 (29.79)	18 (27.27)
20/50-20/100	4 (6.06)	18 (27.27)	2 (4.26)	6 (12.77)
20/20-20/40	0	5 (7.58)	0	1 (2.13)

n: Number of cases, %: Percentage of cases of each type of organism (bacterial/fungal) in the corresponding vision category from the total number of the same organism (bacterial/fungal), FC: Finger count

Table 3: Postoperative visual outcome (change) at 3 months in each group of organism (bacterial vs. fungal)

Improvement in vision on Snellen's	Bacteria, n (%)	Fungal, n (%)	P*
>1 line	21 (31.82)	17 (36.17)	0.63
>2 lines	17 (25.76)	8 (17.02)	0.27
No improvement	11 (16.67)	13 (27.66)	0.16
Worsen	17 (25.76)	9 (19.15)	0.41
Total	66 (100)	47 (100)	

*P value using Z test, not found to be significant for any category (at $P < 0.05$). n: Number of cases, %: Percentage of cases of each type of organism (bacteria/fungus) with the respective visual gain/outcome from the total number of cases of the particular organism (bacteria/fungal)

with regard to graft clarity and survival, bacterial keratitis grafts have been reported to fare better than fungal keratitis.²⁻⁴ One of the reasons for it could be the early use of topical corticosteroids, which is deferred to about 2–3 weeks in fungal keratitis post-TPK cases. Although the primary aim of TPK in cases of refractory infectious keratitis is removal of infective foci and restoration of globe integrity, still the optical clarity of the graft and the visual outcome cannot be neglected. The long-term success would also depend on the development of various sequelae post-TPK, apart from other factors such as the causative agent, preoperative medications, timing of surgery, quality of donor tissue, and size of the graft used.⁵ We hope that this additional information would further the understanding of factors affecting the eventual results of therapeutic corneal grafts and their longevity, though large-scale studies with longer follow-ups are required to better understand the complexities involved in TPK graft survival and prognosis.

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Conflicts of interest

There are no conflicts of interest.

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