

Epidemiology and Clinical Evaluation of Patients Enrolled for Keratoplasty - A Retrospective Study

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Abstract: *Objective:* To describe epidemiology, indication and refusal from keratoplasty. *Method:* The records were analyzed from tertiary care hospital for age, gender, indication and refusal form keratoplasty and visual statuses at the time of re-assessment of patients. *Results:* The medical record of 52 patients were taken who were enrolled for keratoplasty. The average age of patients was 53.20±14.71 ranging from 20-75 year. As the gender, male prevalence was 59.18%. The main indication of Keratoplasty were healed fungal keratitis (42.8%), Bullous Keratopathy (28.5%), corneal opacity due to small pox (14.2%), previously failed keratoplasty (7.1%), Trauma (7.1%), other (0.3%). Visual status of patients on Snellen's visual acuity chart at the time of re-assessment were in range of 6/60-3/60 (5%), 3/60-1/60 (11%), PRaccurate-FC 1 meters (33%), PL+ PRaccurate (16%), PL+ Prin accurate (16%), PL negative (19%) at the time of re-assessment. Most of the patient refusal for surgery due to Denial (34%) after knowing the prognosis, fundal pathologies (22.4%), death (12.2%), unable to contact (12.2%), operated somewhere else (8.1%), others (11.1%). *Conclusion:* Predominantly middle-aged male who were affected and most common indication for keratoplasty being resolved fungal keratitis, followed by bullous keratopathy and most common cause for refusal from surgery was denial, followed by fundal pathologies.

Keywords: keratoplasty, fungal keratitis, visual status, surgery refusal, epidemiology

1. Introduction

Keratoplasty is the surgery that includes removing a disease part of cornea and replace it with healthy donor tissue. The first successful human penetrating keratoplasty (PK) after developments in anesthetics and antiseptic surgery and was performed by Eduard Zirm in December 1905 on a 45-year-old farm laborer with lime burns [1] [2]. The main indications for keratoplasty in developing countries like India are trauma and infection while for developed countries it is keratoconus and congenital corneal opacities [3-5]. Voluntary eye donation is required for this surgery where donor cornea needs to be taken within 6 hours of death and stored in adequate storage media and used for transplantation at the earliest possible time.

The purpose of this study is to describe epidemiology, indication and reasons for refusal from surgery and to evaluate suitable candidates for keratoplasty that were enrolled at a tertiary care centre in India.

2. Method

A retrospective, observational study of total 52 eyes of 52 patients was started from the year 2017 July to 2023 June after approval from the ethical committee at tertiary care center. Patients were called for re-assessment and detailed examination including slit lamp, visual status, intraocular pressure, fundus, B-scan, dry eye assessment, etc. were done. These eyes were first examined at the time of record taking and are reviewed again at the time of study. Many of them got worsened regarding the visual status, dry eye disease and progressive fundal pathologies. Some patients died during this period of time. Patients were called telephonically for the re-evaluation and most of them denied to get operated after knowing the prognosis, some came with worsened disease conditions.

The SPSS version 13 was used for statistical analysis by calculating percentage, frequency, mean and standard deviation.

3. Results

The average age of patients was 53.20±14.71 ranging from 20-75 year. We found male prevalence as 59.18%, i. e. male predominantly involved.

The main indication of Keratoplasty were healed fungal keratitis (42.8%), Bullous Keratopathy (28.5%), corneal opacity due to small pox (14.2%), previously failed keratoplasty (7.1%), Trauma (7.1%), other (0.3%). Most of the patient omitted the surgery due to Denial (34%) after knowing the prognosis, fundal pathologies (22.4%), death (12.2%), unable to contact (12.2%), operated somewhere else (8.1%), others (11.1%).

Visual status of patients on Snellen's visual acuity chart at the time of re-assessment were in range of 6/60-3/60 (5%), 3/60-1/60 (11%), PRaccurate-FC 1 meters (33%), PL+ PRaccurate (16%), PL+ PRinaccurate (16%), PL negative (19%).

Indications of keratoplasty (Table 1)

Table 1

| Causes | Percentage of patients |
|-----------------------------------|------------------------|
| a) Healed fungal keratitis | 42.8% |
| b) Bullous keratopathy | 28.5% |
| c) Post-smallpox lesions | 14.2% |
| d) Previously failed keratoplasty | 7.1% |
| e) Trauma | 7.1% |
| f) Others | 0.3% |

Table 2: Causes for patient refusal

| Reasons for refusing the surgery | Number of patients (n-52) |
|----------------------------------|---------------------------|
| a) Patient's Denial | 34% |
| b) Fundal pathologies | 22.4% |
| c) Death | 12.2% |
| d) Unable to contact | 12.2% |
| e) Operated elsewhere | 8.1% |
| f) Others | 8.1% |
| g) Active infection | 3% |

Table 3: Visual Assessment of Patients

| Visual status at the time of re-assessment | Number of patients (Percentage) (n-20) |
|--|--|
| 6/60-3/60 | 5% |
| 3/60-1/60 | 11% |
| 1/60-PRaccurate | 33% |
| PL+ PRaccurate | 16% |
| PL+ PRinaccurate | 16% |
| PL negative | 19% |

Table 4: Prognostic factors

| | | |
|---------------------------|----------------------|-----|
| IOP (Raised) | | 15% |
| Dry eye (Present) | | 75% |
| Vascularisation (Present) | | 60% |
| Fundus | Not visible | 95% |
| | Myopic changes | 5% |
| B-scan | Retinal detachment | 15% |
| | Vitrous degeneration | 20% |

Table 5: Corneal changes on slit lamp

| | |
|-----------------------------|-----|
| Macular corneal opacity | 30% |
| Leucomatous corneal opacity | 20% |
| Operated keratoplasty | 15% |
| Adherent leucoma | 10% |
| Bullous keratopathy | 10% |
| Corneal ectasia | 5% |
| RK marks | 5% |

4. Discussion

Corneal transplant is the most frequently done organ transplant procedure [6]. It is approximated that 95% of corneal blindness is preventable [7].

Male are more commonly affected because of occupational hazard due to agriculture-based community. Fungal keratitis (post-infectious keratitis scar) is very common indication which was almost identical to that found in study by Dandona et al [8] and much differ from studies in industrialized countries [9-15]. The average age of the affected patients was male of working age group (53.20±14.71) due to occupational hazards. High-risk occupations included welders, farmers, metalworkers and grinding, construction and manufacturing workers. These could be preventable by using suitable protective eye devices (PED) [16].

Another study from southern India [17] has shown bullous keratopathy as most common indication for penetrating keratoplasty which is entirely different from our study outcome.

Limited availability of donor tissue, with lack of storage facility and storage media cause it difficult to meet the

demand. This can improve by creating public awareness regarding eye donations and providing better infrastructure.

Proper explanation of prognosis should be done at the time of earlier registration as most of them refused for the surgery after knowing the prognosis (34%).

There are no such other studies regarding cause for the refusal from keratoplasty by the registered patient. This makes our study unique and first of its kind.

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