ORIGINAL RESEARCH

Evaluation of visual outcome in patients undergoing penetrating keratoplasty

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ABSTRACT

Background: One of the most difficult public health issues facing the globe today is corneal blindness, which is a major source of visual impairment in poor nations like India. The present study was conducted to assess outcome in patients undergoing penetrating keratoplasty. **Materials & Methods:** 90 patients undergoing penetrating keratoplasty of both genders were selected. A thorough visual examination was performed using a slit lamp and torch light, and the results were noted. Every patient had a postoperative examination, treatment, and documentation of any difficulties. **Results:** Visual acuity 1-0.5 had 0 pre-operatively and 5 post- operatively, 0.3-0.16 had 0 pre-operatively and 40 post- operatively, 0.1-0.016 had 46 pre-operatively and 24 post- operatively and CT to PL had 44 pre-operatively and 21 post- operatively. The difference was significant ($P<0.05$). Common pathologies were adherant leucoma in 26 and bullous keratopathy in 12 cases, corneal ulcer in 7, keratomalacia in 5, anterior staphyloma in 3 cases, Leucomatous opacity in 22, chemical injuryin 6, and graft rejection in 9 cases. Common complications were raised OP in 2, mild AC reaction in 5, rejection in 1, epithelial defect in 3, and wound leak in 2 cases. The difference was significant ($P< 0.05$). **Conclusion:** Patients with corneal blindness were reported to respond better to penetrating keratoplasty.

Key words: Penetrating keratoplasty, graft, wound leak

INTRODUCTION

One of the most difficult public health issues facing the globe today is corneal blindness, which is a major source of visual impairment in poor nations like India. Corneal blindness ranks as the fourth most common cause of blindness worldwide (5.1%), according to the WHO. By 2020, it is anticipated that 10.6 million more people in India will have unilateral corneal blindness.[1] The aetiology includes trachoma, corneal degenerations, dystrophies, infectious keratitis, ocular trauma, and bullous keratopathy. During a surgical procedure known as penetrating keratoplasty (PKP), the diseased or damaged cornea is removed from the host and replaced with a full-thickness donor cornea. Enhancing visual acuity, protecting the integrity of the eye, and treating different infections are the main objectives of PKP.[2]

More corneal transplants are performed than any other type of clinical allotransplantation, and their significance has been constantly increasing.[3]Millions of people could potentially have their visual loss reversed by corneal transplantation. Unfortunately, the lack of corneas is limiting the procedure's potential, especially in areas where corneal illness is prevalent, like many rural populations in developing nations.[4] Penetrating keratoplasty success is contingent upon a number of donor and host characteristics, surgical technique, and post-operative care. The majority of PK patients in India have poor socioeconomic status and are illiterate, which makes it challenging to maintain post-operative follow-up and care. This presents a significant hurdle to the success of PK in India.[5]The present study was conducted to assess outcome in patients undergoing penetrating keratoplasty.

MATERIALS & METHODS

The present study consisted of 90 patients undergoingpenetrating keratoplasty of both genders. All gave their written consent to participate in the study.

Data such as name, age, sex, and occupation was recorded.To create a standard scale for analysis, visual acuity in each case was measured using Snellen's chart and translated to log MAR units. A thorough visual examination was performed using a slit lamp and torch light, and the results were noted. The donor cornea was evaluated using a slit lamp to provide

diffuse illumination, and it was rated in accordance with EBAI guidelines. Corneal surgeons performed full thickness PK. Every patient had a postoperative examination, treatment, and documentation of any difficulties. Results were statisticallyanalysed. P value less than 0.05 was considered significant.

RESULTS

Table I Assessment of visual acuity

Visual acuity	Pre-operative	Post- operative	P value
1-0.5	0	5	0.03
0.3-0.16	0	40	
0.1-0.016	46	24	
CF to PL	44	21	

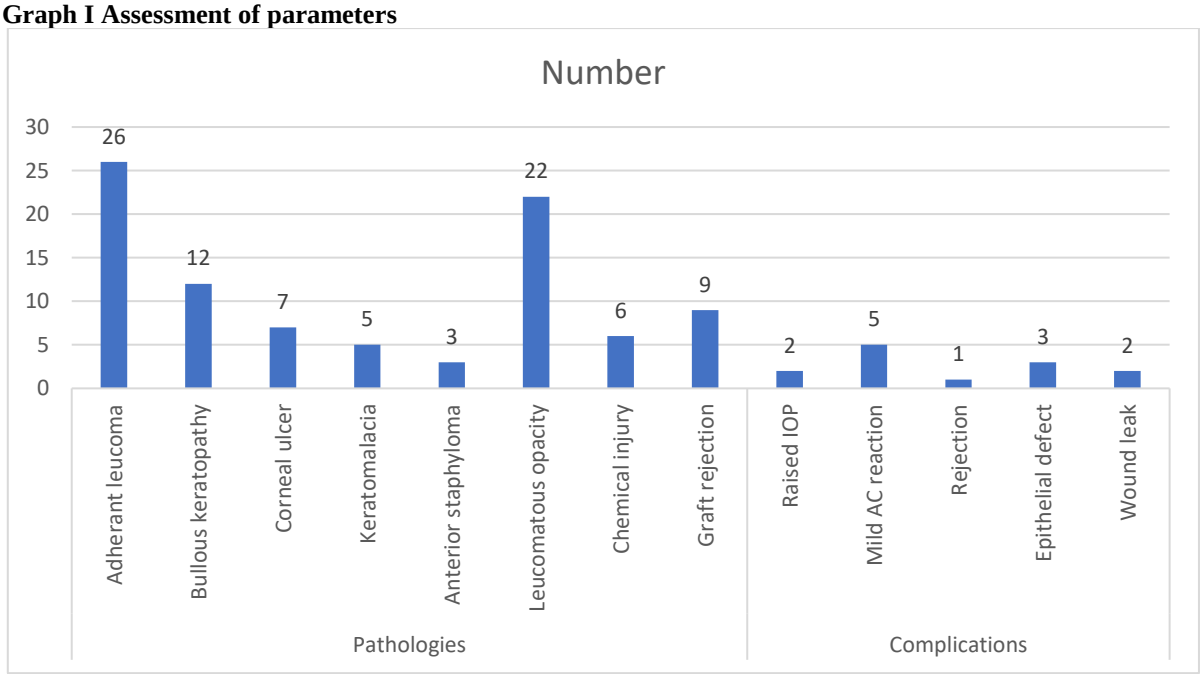
Table I shows that visual acuity 1-0.5 had 0 pre-operatively and 5 post- operatively, 0.3-0.16 had 0 pre-operatively and 40 post- operatively, 0.1-0.016 had 46 pre-operatively and 24 post- operatively and CT to PL had 44 pre-operatively and 21 post- operatively. The difference was significant (P<0.05).

Table II Assessment of parameters

Parameters	Variables	Number	P value
Pathologies	Adherant leucoma	26	0.05
	Bullous keratopathy	12	
	Corneal ulcer	7	
	Keratomalacia	5	
	Anterior staphyloma	3	
	Leucomatous opacity	22	
	Chemical injury	6	
	Graft rejection	9	
Complications	Raised IOP	2	0.05
	Mild AC reaction	5	
	Rejection	1	
	Epithelial defect	3	
	Wound leak	2	

Table II, graph I shows that common pathologies were adherant leucomain 26 and bullous keratopathy in 12 cases, corneal ulcer in 7, keratomalacia in 5, anterior staphyloma in 3 cases, Leucomatous opacity in 22, chemical injury in 6, and graft rejection in 9 cases. Common complications were raised OP in 2, mild AC reaction in 5, rejection in 1, epithelial defect in 3, and wound leak in 2 cases. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

The cornea is the eye's most significant refractive surface. The primary refractive surface is the anterior surface, with a refractive index of 1.38 (1.376). The tear film plays a crucial role in preserving the corneal epithelial cells' natural, healthy environment. The tear film is composed of three layers: an aqueous layer, a superficial lipid layer that reduces evaporation, and an interior mucin layer that lines the hydrophobic epithelium and makes it wettable.[6] The cornea's consistent refractive index across all layers, lack of pigment and blood vessels, relatively dry state, and evenly spaced collagen fibrils in the stroma are all factors in its transparency. The primary function of the endothelial cells is to restrict the cornea's aqueous fluid intake.The cornea's functions includepermitting light to pass through; assisting the eye in focusing light through refraction; preserving the globe's structural integrity; and shielding the eye from UV radiation, toxic compounds, and infectious organisms.[7] With short-term survival rates of up to 90% after a year, corneal transplant surgery is the most frequently performed allograft and is regarded as the most successful solid organ transplant procedure. According to reports from different developed-world transplant registries, keratoconus and other corneal dystrophies are the most common reasons for surgery, followed by bullous keratopathies that are aphakic or pseudophakic. The situation in the developing world is very different, though. First, there are differences in the patient profile and surgical indications.[8]The present study was conducted to assess outcome in patients undergoing penetrating keratoplasty.

We found that visual acuity 1-0.5 had 0 pre-operatively and 5 post- operatively, 0.3-0.16 had 0 pre-operatively and 40 post- operatively, 0.1-0.016 had 46 pre-operatively and 24 post- operatively and CT to PL had 44 pre-operatively and 21 post-operatively. Multivariate logistic regression analysis was used by Williams et al[9] in their study, which shown a strong correlation between corneal neovascularization, ocular inflammation, and ocular hypertension and graft failure at one year. According to the results of the collaborative corneal transplant study (CCTS), the level and depth of preoperative vascularization influence when rejection starts and how severe it gets.

We observed that common pathologies were adherant leucoma in 26 and bullous keratopathy in 12 cases, corneal ulcer in 7, keratomalacia in 5, anterior staphyloma in 3 cases, Leucomatous opacity in 22, chemical injury in 6, and graft rejection in 9 cases. Common complications were raised OP in 2, mild AC reaction in 5, rejection in 1, epithelial defect in 3, and wound leak in 2 cases. Tan et al[10] study patients were Asian, comprising Chinese (72.7%), Indian (11.54%), and Malay (11.1%) ethnicities (mean age, 56.65 years). The mean follow-up period was 36.8+/-35.5 months. Indications for surgery were optical (87.0%), therapeutic (8.1%), and tectonic (4.88%). Main diagnoses were pseudophakic/aphakic bullous keratopathy (23.4%), postinfectious scarring (12.9%), regrafts (12.4%), keratoconus (9.7%), and posttraumatic scarring (7.3%). Kaplan-Meier survival rates for optical grafts were 86.6%, 72.0%, 63.7%, and 52.0% at 1, 3, 5, and 10 years, respectively; survival rates for therapeutic grafts were 78.4%, 58.3%, and 37.3% at 1, 3, and 5 years, and those for tectonic grafts were 68.3% and 41.7% at 1 and 3 years. Endothelial rejection and late endothelial decompensation accounted for 50.51% of failures. Multivariate analysis revealed 9 predictors for graft failure: recipient gender, age, graft size, graft endothelial status, primary corneal disease, glaucoma, inflammation, perforation, and corneal vascularization.

CONCLUSION

Authors found that patients with corneal blindness were reported to respond better to penetrating keratoplasty.

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