

Causes of Vascularised Corneal Opacity Those Were Treated by Corneal Grafting

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Abstract

One of the leading causes of blindness is corneal disorder. By keratoplasty we can restore vision of those patients to some extent and many surgeons are performing keratoplasty on vascularised cornea. Present study was done to evaluate its outcome. Patients (5-70 yrs) were recruited from eye ward of Dhaka Medical College Hospital from January, 2007 to December, 2007. Patients were selected on some criteria. Total 33 cases were evaluated before and after operation. This study was carried out to know pattern of blindness and to obtain the causes of corneal vascularisation and results of keratoplasty on these patients. Among 2 types of grafting all our patients were undergone penetrating keratoplasty. Male predominance (57.50) was marked as male are more prone to corneal diseases and trauma. Considering age group nobody is immune from corneal disease but children and young persons are more vulnerable. Socio-economic status of our maximum patients are middle-class or poor class. We got a rough idea about the causes leading to vascularisation of cornea. Amongst them; trauma, corneal ulcer, chemical injury and under nutrition are noted in our study. Out of 33 healthy grafts, visual improvement occurred in 24 cases. Visual results of grafting on vascularised corneas are variable. Our study concludes that trauma and corneal ulcer are the leading causes of corneal opacity which need penetrating keratoplasty. Whatever the cause of corneal vascularisation, prognosis of keratoplasty on such cases is not disappointing. Rather keratoplasty done on early notified corneal opacity with superficial vascularisation gives satisfactory results.

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Introduction

In an eyeball, the cornea is the transparent anterior one sixth of its outer tunic. In our country the third cause of avoidable blindness is the corneal affection due to trauma or diseases. The only substitute for a damaged cornea is with another healthy one. This procedure is known as keratoplasty or corneal transplantation or corneal grafting. Keratoplasty is now more often under taken with objective

optimism and hope of good visual recovery but very much unpredictable in its outcome. As cornea is an avascular tissue, so to select good recipient, avascularity is a vital factor for rendering good vision in the long run^{1,3}. Keratoplasty on vascularised cornea was kept for as an exclusion criteria previously⁴ because vascularised cornea are very much prone to angiogenesis (revascularisation on recipient cornea) and graft failure; that is why it needs long time immunosuppressive medication after surgery⁵. But now-a-days increasing numbers of ophthalmic surgeons at home & abroad are performing keratoplasty on vascularised cornea with reasonable visual recovery^{4,6}. Though follow up of a corneal grafted patient is necessary almost for life time, but in this limited study we tried to find out the causes of vascularised corneal opacity whose were undergone keratoplasty for visual rehabilitation.

Materials and Methods

This longitudinal type of descriptive study was carried out during January 2007 to December 2007 in the department of Eye, Dhaka Medical College Hospital. Patients admitted in eye ward for surgical intervention for vascularised corneal opacity. 40 cornea affected patients from study population indicated for keratoplasty operation were enrolled purposely in this study on the basis of following criteria - Exclusion criteria were extreme ages [<5 years & >70 years], patient with known autoimmune disorder like SLE, hypothyroidism, patient with uncontrolled DM, patient with history of exposure to radiation or chemical burn & other associated ocular pathology like dry eye, secondary glaucoma, retinal diseases or optic neuropathy etc.

Inclusion criteria were random selection of patients who attended to hospital, age of patients from 5-70 years, recipients having vascularised cornea either superficial or deep vascularisation more than one quadrant & patients with corneal opacity having some clear cornea at the periphery.

It was purposive sampling. After excluding the criteria of exclusion and fulfilling the inclusion criteria first 40 cases were taken serially.

Each eye was expressed as a case. Total 40 cases were evaluated thoroughly before operation and all findings were recorded.⁷ Cases were excluded from the study for different reasons. Thus out of 40 eligible cases finally 33 cases were entered in our study. Postoperatively they were followed up in the eye dept (indoor) of DMCH periodically.

Results

Analytical study was done after collecting all data. The results were as follows:

Table-I: Sex distribution of vascularised cornea patients (n=33)

| Sex | No. of patients | Percentage |
|--------|-----------------|------------|
| Male | 21 | 57.50 |
| Female | 12 | 42.50 |
| Total | 33 | 100 |

Table-II: Age distribution of vascularised cornea patients (n=33)

| Age Group | No. of patients | Percentage |
|-----------|-----------------|------------|
| 1st | 8 | 24.24 |
| 2nd | 9 | 27.27 |
| 3rd | 10 | 30.30 |
| 4th | 6 | 18.18 |
| Total | 33 | 100 |

Table-III: Socio-economic status of the patients (n=33)

| Socio-economic condition | No. of patients | Percentage |
|--------------------------|-----------------|------------|
| Rich | 5 | 15.15 |
| Middle Class | 13 | 39.39 |
| Poor | 15 | 45.45 |
| Total | 3 | 100 |

Table-IV: Causes of corneal vascularisation (n=33)

| Causes | No. of pts | Percentage |
|----------------------|------------|------------|
| Physical trauma | 12 | 36.36 |
| Healed corneal ulcer | 8 | 24.24 |
| Chemical injury | 8 | 24.24 |
| Undernutrition | 5 | 15.15 |
| Total | 33 | 100 |

Table-V: Prognosis of grafted patients (n=33)

| Visual acuity | Number of patients | Percentage |
|---------------|--------------------|------------|
| 6/24 | 4 | 12.12 |
| 6/36 | 5 | 15.15 |
| 6/60 | 15 | 45.45 |
| Hand movement | 9 | 27.27 |
| Total | 33 | 100 |

Discussion

In human body, one the most common transplant procedures is penetrating keratoplasty (more recognizable to patients as corneal transplant or graft). The main aims of a corneal graft are to improve vision, reduce pain and repair structural damage. A successful visual outcome depends on the long- term survival of the graft. Good recipient preferably non vascularised cornea, good donor tissue and good surgical technique are the main determining factors for survival of any type of host graft junction^{5,7,8}.

The study of this series of 33 patients was carried out to know a little bit pattern of blindness in our country and to obtain the causes of corneal vascularisation as well as prognosis of keratoplasty on such patients.

Among 2 types of grafting all our patients were undergone penetrating keratoplasty, because our people are not aware of their diseases and as a result corneal diseases involve the deeper layer where lamellar keratoplasty is not indicated^{7,13}. Male predominance (57.50) was marked as

male are more prone to corneal diseases and trauma. Considering age group no body is immune from corneal disease blindness but children and young persons are more vulnerable as in case of children trauma and nutritional deficiency and in case of young adult industrial and agricultural trauma are more happened. Socio-economic status of our maximum patients are middle-class or poor class, as they are not aware of their health care in their struggling of life^{9,10}.

From table-IV, we gets a rough idea about the causes leading to vascularisation of cornea. Amongst them; trauma, corneal ulcer, chemical injury and under nutrition are noted in our study. Mentionable that though few patients of vit-A deficiency were noticed in our study, but vit-A deficiency is no more a challenging factor for us, which causes the pre-mature blindness of our future generation. On the contrary, it is a matter of worriedness that trauma (physical or chemical) is the leading cause of corneal scarring. Rather these patients attend to doctor or hospital in late due to lack of awareness, as a result enough time enhances cornea for development of vascularisation. Our findings are very much compatible with other investigators who worked similar studies^{2,11,12,13}.

In table-V, visual prognosis of grafted patients on vascularized cornea are shown. Out of 33 healthy grafts, more or less visual improvement occurred in 24 cases. Multiple factors affected this variation. If the visual acuity is considered as the main factor for success of corneal grafting, then our study carries a significant result^{2,13}.

Regarding vascularisation of the recipients it was revealed that vascularisation did not recur after the corneal grafting within our short follow up time . This correlates with the results of the study made by Huda KH on the relationship of preoperative vascularisation with postoperative graft clarity and rejection¹³.

From the study it is concluded that trauma/ injury and corneal ulcer are the most prior causes of corneal opacity enhancing vascularisation which needs penetrating keratoplasty. Though corneal ulcer is a multifactorial disease but by taking preventive measures and developing consciousness we can, at least, reduce the incidence of trauma. Regarding performing keratoplasty on vascularized cornea, though our study does not reflect the whole scenario of this situation as it is done in a smaller scale; so to give a final and concrete comment similar study should be conducted in a larger scale by multicentric procedure.

References

1. Kanski J J. Clinical Ophthalmology-A systemic approach. Butterworths, 5th Edn. 2003;145-147.

2. Bhuiya M S I, Faruk T I M A. A study of the success rate of Keratoplasty. *Bangladesh Medical Journal*. 2001;30(1).
3. Buxton J N, Apison J H, Hoeffle FB. Corticosteroids in 100 Keratoplasties. *Am J Ophthalmol*. 2005;67:46.
4. Ainslie D C. Recent Advances in Keratoplasty. *Brit J Ophthal*. 2004; 58:340
5. Kirk R W. Basic & Clinical Science course, External Disease & Cornea. The foundation of the American Academy of Ophthalmology. 2000-2001;8:407.
6. Marjolijn C. Long-term out come in high risk corneal transplantation and the influence of HLA-A and HLA-B matching. 2003; *Cornea* 22(6):552-556.
7. Soong H K. Penetrating keratoplasty in focal points. Clinical modules for Ophthalmologists. American Academy of Ophthalmology, San Francisco. 2006; 10:6.
8. Roper-Hall M J. *Stallard's Eye Surgery*, Butterworth-Heinemann Ltd., 7th Edn. 2003.
9. Walter J. Stark, Hugh R. Taylor, Manuel Datiles, Elaine young, Pamela Klein. *Clinical & Experimental Ophthalmology*. 2007, issue 4: p 333-389.
10. Beekhuis WH. Current clinician's on risk factors in corneal grafting. *Cornea*. 1995;14:39-42
11. P A Dyer, A B Tullo. Cornea transplantation in Britain. *BMJ*. 1995;10:1347-1348.
12. Volker-Dieben HJ, Kok-van Alphen C C, Lansbergen Q, Persijn G G. Different influence on 539 transplants. *Acta ophthamol (Copen)*. 1982 Apr,60(2):190-202.
13. Huda KH. Study on Outcome of Penetrating Keratoplasty (P.K)-A Retrospective Study. 2003, (In dissertation) pp 216-228.