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STUDY OF VISUAL OUTCOME FOLLOWING PENETRATING KERATOPLASTY WITH HARD CONTACT LENS

Ophthalmology

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ABSTRACT

Objectives of the study:- To determine visual outcome following penetrating keratoplasty with hard contact lens.

Materials and methods: Total 31 number of cases who have undergone penetrating keratoplasty for various indications in past were examined and evaluated for visual outcome with hard contact lenses, at DEPARTMENT OF OPHTHALMOLOGY,P.D.U.GOVT.MEDICAL COLLEGE,RAJKOT.

Result & analysis: Among 31 cases, all patients were examined and found to have marked improvement of visual acuity with use of hard contact lens.

Conclusion: 1.After penetrating keratoplasty,all patients have variable amont of astigmatism which causes marked diminitution of unaided visual acuity.

2. Visual outcome with use of hard contact lens has been found to be markedly increased in all patients of penetrating keratoplasty.

KEYWORDS

penetrating keratoplasty, astigmatism ,hard contact lens

INTRODUCTION:

Penetrating keratoplasty is a transplant procedure in which full-thickness host corneal tissue is replaced with donor healthy corneal tissue. Depending on the corneal pathology present, the objectives of penetrating keratoplasty may include one or more of the following: (1) to establish a clear central cornea/visual axis, (2) to minimize refractive error, (3) to provide tectonic support, (4) to alleviate pain, and (5) to eliminate infection. Patients who have undergone penetrating keratoplasty surgery, may suffer from low visual acuity, one of the reason for which is astigmatism. Preoperative factors include ectatic conditions of the cornea, such as keratoconus and Pellucid marginal degeneration, corneal thinning, scarring, corneal neovascularization and aphakia. Intraoperative factors, such as pre-existing astigmatism in the donor, very young donor eye, failure to excise peripheral tissue in keratoconus and Pellucid marginal degeneration, depth, number, orientation and tension of sutures, diameter of the graft (too large or too small grafts), eccentric trephination of host or donor tissue, and oversizing of the graft can all significantly contribute to astigmatism. Postoperative factors influencing astigmatism include wound healing, overriding of the graft host junction and timing of suture removal. Other factors such as postoperative trauma, on-going surface inflammation, need for other surgical procedures such as cataract surgery or filtration procedures will also impact astigmatism.

Various types of contact lenses have been used to manage postkeratoplasty astigmatism, including hybrid, scleral, rigid gas-permeable, and piggyback contact lenses. Early visual rehabilitation is possible with spectacles and contact lenses even with the sutures in place. Spectacle correction is limited by the astigmatic anisometropia, in contrast, rigid gaspermeable lenses offer good visual acuity in moderate to severe astigmatism and is effective in 80% of patients[1]. For asymmetrical astigmatism, depending upon the amount and the location of the irregularity, a large standard tricurve, aspheric, or keratoconic design may be acceptable[2,3]. Scleral contact lenses which are custom made is the most recent option available in grafts with complex geometry for successful visual rehabilitation. Difficulties with fitting and handling, the risk of infection and the potential for graft rejection limit the use of contact lenses. Prior to surgical considerations for addressing residual astigmatism the refraction must be stable and a minimum period of three months must have elapsed post-suture removal. The plethora of available choices in the literature, such as Compression sutures, wedge resections, relaxing incisions, astigmatic keratotomy, lamellar keratotomy, photorefractive keratectomy, and laser in situ keratomileusis only serve to highlight the complex nature of the problem.

Other techniques includes relaxing incisions,astigmatic keratotomy,Compression Sutures,Wedge Resections,Laser in Situ Keratomileusis,Photorefractive Keratectomy,Intraocular Lenses and Intrastromal Ring Segments.

In this study, role of hard contact lens has been evaluated for such patients with astigmatism following penetrating keratoplasty.

AIM & OBJECTIVES OF THE STUDY:-

Study of visual outcome following penetrating keratoplasty with hard contact lens.

Objectives of the study:-

1.To determine the incidence of astigmatism after penetrating keratoplasty at OPHTHALMOLOGY DEPARTMENT,P.D.U.GOVT. MEDICAL COLLEGE,Rajkot.2.Visual outcome following penetrating keratoplasty with hard contact lens

MATERIALS AND METHODS:

Total 31 number of cases who have undergone penetrating keratoplasty for various indications in past were examined and evaluated for visual outcome with hard contact lenses, at DEPARTMENT OF OPHTHALMOLOGY,P.D.U.GOVT.MEDICAL COLLEGE,RAJKOT.Any patient who attended outdoor patient department ,department of ophthalmology.P.D.U.GOVT.MEDICAL COLLEGE,Rajkot for routine check up or routine follow up,was informed about the study “study of visual outcome following penetrating keratoplasty with hard contact lens” and patient information sheet was given along with written consent paper for study.patients were allowed to take their own decision regarding voluntary participation in the study and then informed written consent was taken from participants.

Brief history regarding patient information index,contact details, address,date of admission,date of surgery,date of discharge,vision and slit lamp examination finding at the time of admission,binocular indirect ophthalmoscopic finding at the time of admission, routine investigations like blood pressure,urine sugar,HIV,HbsAg,intraocular tension,B-scan,sac syringing at the time of admission were noted.

Brief surgical details and intra-operative events and special steps were noted if available.treatment given while patient was admitted and treatment given after discharge was noted.

INCLUSION CRITERIA:

Patients who have undergone penetrating keratoplasty with clear corneal graft.

EXCLUSION CRITERIA:

1. Patients with detected retinal and posterior segment

abnormalities.
2. Patients with optic nerve head abnormalities.
3. Patients with active infection in eye, associated painful conditions of eye and having contraindications for use of hard contact lens.

Patient was examined for uncorrected visual acuity and pin hole vision.slit lamp examination was done then after ophthalmoscopy was done.

Auto-refractometry and keratometry was done in eye to be examined(operated for penetrating keratoplasty) and values noted after average of 3 readings. Hard contact lens with base curve 0.60 mm more than flattest curvature or contact lens with flattest available base curve if earlier not available, was chosen with available power nearest to spherical correction as shown in auto-refractometry.diameter of hard contact lens to be used was noted.[4]

Local anaesthetic agent e.g. 2% xylocaine was instilled in eye to be examined.after 30 sec of xylocaine instillation,patient`s lower lid was retracted and inverted hard contact lens with convexity facing towards index finger tip of examiner was put on cornea with well cleaned and washed index finger tip of examiner.patient was allowed to blink and auto-refractometry was done again.

Subjective correction was done over hard contact lens according to findings obtained by on top auto-refraction with hard contact lens. Topical ciprofloxacin 0.03% eye drop was prescribed QID for 3 consecutive days to avoid infection in lens induced micro-abrasions over cornea.[5]

Contact lenses were cleaned after and before every use. Deproteinization of lenses were done every 15 days. Contact lens were placed in a clean vial along with CL solution and an enzyme tablet. The vial were closed and kept for 4-6 hours. Protein deposits are dissolved by action of enzyme. CL is taken out and the CL solution of vial is discarded. After cleaning with fresh CL solution the contact lenses are ready for use.[6]

Individual visual outcome with use of hard contact lens in patients with penetrating keratoplasty were compiled and studied statistically to obtain conclusion.

RESULT & ANALYSIS:

Total 31 cases were evaluated, out of 31 cases , 18 were male and 13 were female patients. Figure 1 shows distribution of visual acuity among patients after penetrating keratoplasty,9 patients` vision was below 3\60,9 patients have vision between 3\60 and below 6\60, 12 patients have vision between 6\60 and below 6\18 and 1 patient has vision between 6\18 and 6\6.

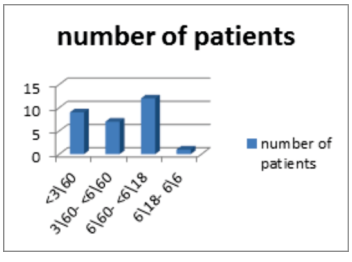

FIGURE 1

figure 2 shows distribution of best corrected visual acuity after use of hard contact lens in post penetrating keratoplasty patients.among 31 cases,26 have BCVA in range of 6\18- 6\6 and 5 patients have BCVA in range of 6\60- <6\18 and no patient has less than 3\60.

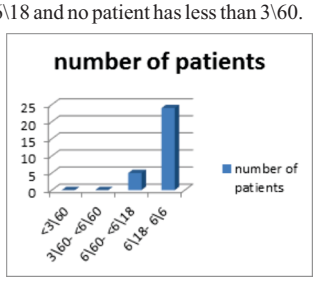

FIGURE 2

DISCUSSION AND INTERPRETATION:

Various studies similar to this study has been analysed.

Number of patients & mean visual improvement with hard contact lens: TABLE 1

Name of author	Mean visual acuity with hard contact lens	Number of patients
Wietharn B & Driebe WT Jr[7]	6\12	30
Genvert, Cohen, Arentsen, Laibson [8]	6\9	70
Current study	6\12p	31

TABLE 1

Wietharn BE1, Driebe WT Jr[7]. identified 35 eyes in 30 patients wearing contact lenses for visual rehabilitation after penetrating keratoplasty.The average time from surgery to initial contact lens fitting was 18.2 months. Spherical rigid gas-permeable lenses were the most common type of lens used. The mean best-corrected visual acuity improved from less than 20/40 with spectacles alone to better than 20/30 when using a contact lens.Genvert GI, Cohen EJ, Arentsen JJ, Laibson PR[8] 74 eyes (70 patients) were fitted with gas-permeable Polycon contact lenses and monitored for at least six months (range, six to 33 months; mean, 14 months). Astigmatism in this series ranged from 0 to 17.50 diopters (mean, 7.7 diopters). Most patients achieved visual acuities of 20/40 or better (67 of 74, 90%) with contact lenses.

this current study,among 31 eyes of post penetrating keratoplasty patients,18 male patients and 13 female patients has been examined.Mean age of patients is 67.65 years.Mean age of donor is 29.9 years.Mean vision after penetrating keratoplasty is 4.51 mFC and with use of hard contact lens it is 6\9p.

patients are from age group of 40 to 80 years. Maximum 8 post penetrating keratoplasty patients are examined within >3-6 months of surgery done, 5 patients are examined within 0-3 months and >6-9 months,4 patients are examined within >9-12 months and 2 patients were examined within >18-21 months, 1 patient is >12-15 months,>15-18 months and >24-27 months. Among 31 cases indication for penetrating keratoplasty are as following, 14 patients had pseudophakic bullous keratopathy, 12 patients had corneal opacity, 1 patient had corneal dystrophy and 4 patients had no previous records. 9 patients` vision is below 3\60,9 patients have vision between 3\60 and below 6\60, 12 patients have vision between 6\60 and below 6\18 and 1 patient has vision between 6\18 and 6\6. After use of hard contact lens, 26 patients have visual acuity in range of 6\18- 6\6 and 5 patients have visual acuity in range of 6\60- <6\18 and no patients has less than 3\60. 5 patients have astigmatism between -5.00 and <0 D,14 patients have astigmatism between -10.00 and < -5.00 D, 9 patients have astigmatism between -15.00 and <-10.00 D, 2 patients have astigmatism between -20.00 and <-15.00 D while 1 patient has unrecordable astigmatism. With use of hard contact lens, astigmatism in 7 patients are in range of 0 to <5.00 D, 24 patients are in range of -5.00 to <0 D. Among 31 cases, all patients were examined and found to have marked improvement of visual acuity with use of hard contact lens.

CONCLUSION:

After penetrating keratoplasty,all patients have variable amont of astigmatism which causes marked diminitution of unaided visual acuity.Visual outcome with use of hard contact lens has been found to be markedly increased in all patients of penetrating keratoplasty.

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