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Pterygium – Early Excision with Conjunctival Auto-graft, Improves Vision and Prevents Visual Impairment

KEYWORDS: Pterygium, visual impairment, vision improvement, auto-graft.

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ABSTRACT *Pterygium is a fleshy fibrovascular sub-epithelial growth of degenerated bulbar conjunctival tissue over the limbus on to the cornea. Pterygium leads to significant visual impairment, which increases with the increase in the grades of pterygia. The objectives of our study were to study, visual impairment due to various grades of pterygia, and improvement in the vision following surgery. 79 patients with primary pterygium were studied during July 2012 and December 2012. Pterygium excision with conjunctival auto-graft was done in all patients. Patients with grade I pterygium had visual impairment up to 15%, grade II 40%, and grade III pterygium-patients had more than 50% visual impairment. While, vision improvement to near normal, after surgery, was 100%, 90.3% and 14.3% in grade I, II, and III respectively.*

Introduction

Pterygium is a triangular fibro-vascular sub-epithelial ingrowth of degenerated bulbar conjunctival tissue over the limbus on to the cornea.[8] Pterygium is commonly seen in India, a part of the "pterygium belt" described by Cameron.[1] It occurs at higher prevalence in tropical areas, associated with ultraviolet(type B) light exposure.[16,11] New theories of pterygium genesis include damage to limbal stem cells by ultraviolet light and by activation of matrix metalloproteinases.[2,3,9,17] Studies have suggested that p53 and human papilloma virus may also be implicated in pterygium pathogenesis.[7,15] The patho-physiology of pterygia is characterized by elastotic degeneration of subepithelial tissue of the conjunctiva and destruction of Bowman's membrane and superficial lamellae of the cornea. Progression of a pterygium onto the cornea can lead to a considerable effect on corneal refractive status and visual impairment.[6,12] Pterygium was graded depending on the extent of corneal involvement: Grade I - head of the pterygium present between limbus and a point, midway between limbus and pupillary margin. Grade II - head of the pterygium present between a point midway between the limbus and the pupillary margin and pupillary margin (the nasal pupillary margin in case of nasal pterygium and the temporal margin in case of temporal pterygium). Grade III - head of the pterygium crossing pupillary margin.[13] Symptoms of pterygium include foreign body sensation, photophobia, ocular motility disorder, cosmetic disturbance, and visual impairment, which increases with the increase in the grades of pterygia.[10,13,14] Treatment of pterygium is surgical. Numerous surgical techniques, including radiation therapy, the use of thiotepa and mitomycin C, conjunctival and amniotic membrane grafts, bare sclera technique, and lamellar keratoplasty have been developed to decrease the recurrence rate. The aim of this research paper was to study, visual impairment due to various grades of pterygia, and improvement in the vision following surgery.

Materials and Methods

79 patients with primary pterygium were admitted and operated in ophthalmology department of Smt. Kashibai Navale Medical College and General Hospital, Narhe, Pune. The study was conducted during July 2012 and December 2012, after obtaining necessary permission from the concerned authorities. Patients with history of trauma, previous surgery, and having corneal scar were not included in the study. Informed consents were taken from all the patients. All surgeries were performed by a single surgeon.

Patient data collection included recording of age, sex, occupation, affected eye, grading of pterygium (I, II, III) and best corrected visual acuity (BCVA) before and after the surgery. keratometry was done for all patients, but there were errors due to irregular corneal surface in about 60% of the patients. So we discarded the keratometric readings. For study purpose, we grouped these patients according to the grades of pterygia (grade I, II, and III). Further we clubbed, grade I and grade II pterygium patients together, as pterygia of these grades does not cross the pupillary margin and visual axis is not involved directly. Pterygium of grade III crosses the pupillary margin and hence causes profound visual loss. Pterygium excision with conjunctival auto-grafting without sutures or fibrin glue was done. The patients were discharged on the second postoperative day. Follow-up was done at 7th day, 15th day, and 30th day. Change in BCVA was noted at end of one month. Analysis of patients in relation with grades, visual impairment, and vision improvement after surgery is done. Results were analyzed with the help of statistical software.

Results

79 eyes of 79 patients having primary pterygium were included in the study.

Table 1: Age, sex, occupation, eye affected, and position of pterygium in 79 patients.

		No. of patients
Age in years	18-39	23 (29%)
	40-78	56 (71%)
Sex	Male	26 (33%)
	Female	53 (67%)
Occupation	Outdoor	61 (77%)
	Indoor	18 (23%)
Eye affected	RE	48 (60.8%)
	LE	31 (39.2%)
Position of pterygium	Nasal	76 (96.2%)
	Temporal	3 (3.8%)

Out of 79 patients, 23 (29%) were below the age of 40 years and 56 (71%) were 40 years and above. Out of 79 patients, 29 (33%) were males and 53 (67%) were females. 61 (77%) patients were working in the farms or working as salesmen. While 18 (23%) patients were either working in the offices, or in the home. Right eye was affected in 48 (60.8%) patients and left eye was in 31 (39.2%). Nasal pterygium was present in 76 (96.2%) patients and temporal pterygium was in only 3(3.8%) patients.

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Table 2: Grades of pterygium and vision impairment.

Grade of pterygium		BCVA Before surgery	No. of pati-ents	Total No. of patients	
	Vision impairment				
I	0%	6/6	2	27 (34.2%)	58 (73.4%)
	10%	6/9	6		
	15%	6/12	19		
II	25%	6/18	12	31 (39.2%)	
	30%	6/24	10		
	40%	6/36	9		
III	50%	6/60	15	21 (26.6%)	
	55%	5/60	4		
	60%	4/60	2		
				79	

27 (34.2%) patients with grade I pterygium had vision impairment up to 15% and 31 (39.2%) patients with grade I pterygium had vision impairment up to 40%. 21 (26.6%) grade III pterygium patients had more than 50% vision impairment.

Table 3: Visual improvement after one month of surgery.

Grade of pterygium	No. of patients		BCVA After surgery		No. of patients improved to near normal vision	
			6/6	6/9		
I	27	58	25	2	27(100%)	55 (94.8%)
II	31		15	13	28(90.3%)	
III	21		1	2	3(14.3%)	
	79		41	17	58	
Chi- square = 47.203 ; d. f. = 1 ; P = 0.0000 (highly significant)						

Out of 27 grade I patients 25 improved to 6/6 normal vision and 2 patients improved to 6/9 vision i.e. 27 (100%) patients improved to near normal vision. In grade II, 15 patients improved to 6/6 and 13 patients to 6/9 vision (out of 31 patients) i.e. 28 (90.3%) out of 31 patients showed improvement to near normal vision. Thus 55 (94.8%) patients out of 58, when grade I and grade II, clubbed together, had significant vision improvement. Statistical analysis was done with the help of software -Primer of Biostatistics version 5.0. It showed value of P (P = 0.0000), which is highly significant. On the contrary 21, grade III patients showed vision improvement in 3 (14.3%) patients only.

Discussion

Pterygium is common in tropical countries like India. Constant exposure to bright sunlight and hot, dusty climate is precursor of pterygium.[2,3,13] It crosses over the limbus, spreads and invades the superficial corneal layers.[1] The progression of a pterygium onto the cornea can lead to both, significant corneal distortion and development of large amount of corneal astigmatism, which is directly responsible to decreased visual acuity.[2,16] Grade III pterygium when it grow towards the pupillary area and crosses the margin of the pupil, it invades the visual axis directly.[12,14] This type of growth of grade III pterygium can cause corneal distortion and visual loss.[17] Our study shows that vision impairment in grade I pterygium was up to 15% and up to 40% in grade II . These two groups showed highly significant (P= 0.0000) vision improvement as compared to grade III patients where improvement is very less after the surgery. Vision impairment in grade III patients is more than 50%. It will be a blinding disease when pterygium crosses the whole cornea covering the pupil. Pterygium excision markedly reduces the astigmatism.[10,11] When pterygium covers the entire pupil, there will be profound visual loss and that cannot be corrected by surgery. Early surgery (Grade I, Grade II stage) can prevent such a big visual loss.

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