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Research Article

Comparative Study of the Technique of Limbal Stem Cell Conjunctival Autografting with 0.02% Mitomycin-C and bare sclera excision in the management of Pterygium

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Abstract: The objective is to assess success rate of bare sclera excision and limbal stem cell conjunctival autografting along with intraoperative 0.02% mitomycin-c. Prospective, multicentric , randomized, controlled and comparative intervention study designed with 109 patients which opted two types of surgery for pterygium while visiting the regular OPD over a period of 18 months. 9 patients left the study group on follow up so final study group was of 100 patients. In methodology, Group 1 : Control group (n=50) – Excision of pterygium, leaving bare *sclera* . Group 2 : Study group(n=50) – Limbal stem cell cojunctival autografting and intraoperative 0.02% Mitomycin-C application after bare sclera excision. All surgeries were performed on outpatient basis by single surgeon using same technique with aim was to assess recurrence rate in two techniques for the management of pterygium. The recurrence rate was 38% in bare sclera excision and only 6% in cases of limbal stem cell conjunctival autografting with intraoperative 0.02% mitomycin-c. The recurrence rate was clearly dependent on the type of surgical approach. Limbal stem cell conjunctival autografting and intraoperative application of 0.02% MMC proved to be a far better technique with very low recurrence rate of only 6% whereas bare scleral excision technique resulted in a very high recurrence rate of 38%. The recurrent pterygium cases are better managed only by limbal stem cell conjunctival autografting with 0.02% MMC application.
Keywords: Pterygium, Bare sclera excision, Limbal stem cell conjunctival autograft

INTRODUCTION

The pterygium[1] is a chronic inflammatory keratoconjunctivitis – cum –hypertrophic ,degenerative process of the conjunctiva, in which a triangular portion of the bulbar conjunctiva encroaches upon the cornea. It's origin, development and tendency to relapse and recur, all offer problems, which are yet to be solved by ophthalmic surgeons.

Current theories regarding pathogenesis includes u.v. light exposure, chronic conjunctival inflammation, elastodysplasia, elastodystrophy, stem cell aplasia and dry-eye. Jun Shimazaki stated that pterygium could be considered a local limbal cell deficiency[2]. Overall, prevalence rates ranges from 0.7% - 31% in various populations around the world[3].

We conducted a prospective study of the management of pterygium by two different techniques to find the following objectives:

1. Recurrence rate in two study groups
2. Demographic profile , and
3. To find out the better surgical technique in the management of pterygium[4].

METHODS

The study was conducted at two clinical ophthalmological centers but by same surgeon and using the same techniques. Patients were properly counciled about the nature ,outcome , long follow – up period and all possible complications alongwith the recurrence possibility and proper consent was also taken.

Selection of Cases

109 eyes with both primary and recurrent pterygia were distributed in the two groups. Cases with primary progressive pterygium were distributed randomly in two groups. Recurrent pterygium were included in the 2nd group only. 9 operated eyed patients were absconded in the follow up period so they were excluded. Final study group was of 50 cases in each group.

Group 1 : Control group(n=50)- Excision of pterygium , leaving bare sclera.
Group 2: Study group(n=50)- Limbal stem cell conjunctival autografting and intra-operative application of 0.02% MMC for 5 mins.

All cases were operated under retrobular plus facial- block and were given by the anaesthetist. Patients suffering from ocular diseases like corneal ulceration, corneal edema, keratitis, scleral ulceration, uveitis and glaucoma were not included in this study. After surgery , topical tobramycin- dexamethasone ointment was instilled and the eye bandaged for 48 hours, followed by instillation of tobramycin – fluromethalone eye drops along with decongestant and 0.5% CMC eye drops for 6 – 8 weeks.

All the patients were called on postoperative days 3, 15, 30 ,90 ,120 and 180 .

Routine Examination

At each follow – up visit both gross and slit-lamp examination was done to look for:-

1. Conjunctival graft edema[5]
2. Button hole in the graft
3. Epithelial inclusion cyst
4. Hematomas
5. Retraction or necrosis of the graft[6]
6. Tenon's granuloma
7. Extraocular muscle disinsertion
8. Suture cut through[7-9]
9. Graft-displacement[10-12], and
10. Any recurrence

RESULTS

Between Dec. 2013 to May 2014, 109 patients with primary and recurrent pterygium were operated in this study at 2 clinical sites and were followed for 6 months to 1 year. Age group was between 20->61 years. 9 patients were absconded so excluded from this study.

This table-1 shows that incidence were almost same in male and female populations.

This table-2 shows that disease was more common amongst rural population (85%) than urban (15%).

The table-3 shows that recurrence rate was quite high (38%) in bare-sclera excision group as compared to very low (6%) in limbal stem cell conjunctival autografting with 0.02% MMC group.

Table-1: Sex Wise Distribution of all age groups

Type	Female		Male		Total
	Cases	%	Cases	%	
Bare Sclera Excision	25	25%	25	25%	50
Limbal Stem cell Conjunctival autografting with 0.02% MMC	27	27%	23	23%	50
TOTAL	52	52%	48	48%	100

Table-2: Demographic profile

Type	Rural		Urban		Total
	Cases	%	Cases	%	
Bare Sclera Excision	40	40%	10	10%	50
Limbal Stem cell Conjunctival autografting with 0.02% MMC	45	45%	05	05%	50
TOTAL	85	85%	15	15%	100

Table-3: Success rate in two groups with mean follow up of 8 months + 4 months

	No Recurrence (n)	Recurrence (n)	Success
Bare Sclera Excision (n=50)	31	19	62%
Limbal Stem cell Conjunctival autografting with 0.02% MMC	47	03	94%

DISCUSSION

In this prospective, controlled randomized and comparative observational study of 100 patients with primary and recurrent pterygium in age group 20->61 years , we found that limbal stem cell conjunctival autografting with intraoperative 0.02% MMC technique was very effective in management of pterygium as compared to simple bare sclera excision[13].

It was 6 % recurrence rate observed in limbal stem cell conjunctival autografting with 0.02% MMC group and 38% recurrence rate was observed in bare sclera excision group[14-15].

Pterygium excision with conventional bare sclera excision technique is accompanied by recurrence rate of 32 to 89% [16-17]. Because of the increased recurrence rate and visual complications, some new

modification in pterygium surgery as well as adjunctive treatment is mandatory. Now newer techniques are available as an adjunctive to the bare sclera technique with low recurrence rates and complications[18].

Limbal stem cell conjunctival autografting along with intraoperative 0.02% MMC application is emerging as a better option in prevention of recurrence of pterygium. In this technique healthy stem cell limbal conjunctival autograft with adjunctive MMC acts as a barrier between the degenerative conjunctival tissue and the cornea , hence helps in preventing the recurrence.

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