Original Article

Recurrence Rate of Pterygium Between Amniotic Membrane versus Stem Cell Graft following Pterygium Excision

Recurrence of Pterygium after different treatment modality

Zulfiqar Ali, Nadia Nazir and Tariq Mehmood Arain

ABSTRACT

Objective: To find out and compare the recurrence rate of pterygium using amniotic membrane versus stem cell graft techniques following the excision of pterygium.

Study Design: A single open label, randomized control trial.

Place and Duration of the Study: This study was conducted at the Department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur, from July 2016 to June 2017.

Materials and Methods: We enrolled a total of 80 patients of both gender, aged more than 18 years, having grade 2-3 of pterygium causing discomfort, impairment of vision or disfigurement, undergoing pterygium excision. Group A contained 40 patients and pterygium excision was done using amniotic membrane grafting (AMG) whereas Group B had 40 patients where stem cell graft (SCG) was performed. Mean and standard deviations were calculated for continuous variables while frequency and percentages were estimated for quantitative variables. Chi square test was applied and p value $\leq$ 0.05 was considered as significant.

Results: There were 44 (55.0%) male and 36 (45.0%) female. Mean age was recorded as 40.73 years with a standard deviation of 8.6 years.In terms of grafting edema, 1 (2.5%) patient was observed in Group A while there were 5 (12.5%) patients having grafting edema in Group B (p value = 0.090). Hemorrhage was reported in 5 (12.5%) patients of Group A as compared to 2 (5.0%) in Group B (p value = 0.235). Pterygium recurrence was noted in 6 (15.0%) patients of Group A in comparison to 2 (5.0%) in Group B (p value = 0.136).

Conclusion: Although in terms of complications and recurrence, no major statistical difference was found in between the two studied group, SCG was associated with less recurrence rate following pterygium excision.

Key Words: Pterygium excision, amniotic membrane graft, stem cell graft, recurrence

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INTRODUCTION

Pterygium is described to be a fibrovascular conjunctival tissue that is known to invade cornea.[1] Shape of pterygium is explained as 3 sided while it is more frequently lie nasally in comparison to temporally.[2] Ocular irritation, hyperemia as well as loss of vision are the commonest form of symptoms accompanying pterygium.[3] It has been found that chronic inflammatory cells are present in pterygium samples which could mean that chronic inflammation may be considered as the contributor to pterygium occurrence.[4,5]

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There seems to be some gender peculiarity in terms of pterygium as it is 2 times more common in male in comparison to female and increasing age has also been found with increase in its incidence.[4,6] As pterygium can cause visual impairment, surgical methods have been found to be the mainstay of management since 1940.[7]It has also been document widely that pterygium procedure is associated with high rates of recurrence.[8] Inflammation can further invoke the activation of the reminder of pterygial body fibroblasts and could go on to become the invasive phenotype of this disease. [9-11]

Bare sclera technique is considered to be the primary technique for the management of pterygium that has been linked with a recurrence rate as high as 37 to 90% so different kind of surgical methods are in practice currently.[12] As many treatment modalities exist for the management of pterygium[13-16] but data is scarce specially in our setting regarding safety and efficacy of the procedures adopted. We planned this study to find out and compare the recurrence rate of pterygium using amniotic membrane versus stem cell graft techniques following the excision of pterygium.

MATERIALS AND METHODS

This Single open label, randomized control trial was conducted at the Department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur, from July 2016 to June 2017. Approval from the institute's ethical and research committee was taken for this study. Informed consent was sought from all the study participants.

By adopting non probability consecutive sampling technique, we enrolled a total of 80 patients of both gender, aged more than 18 years, having grade 2-3 of pterygium causing discomfort, impairment of vision or disfigurement, undergoing pterygium excision.[17] Patients with diabetes mellitus and corneal diseases were excluded. Patients were divided in to 2 groups, Group A contained 40 patients and pterygium excision was done using AMG whereas Group B had 40 patients where SCG was performed.

Randomization was done by using paper slips lottery method and being a single open label trial, surgeon knew what type of procedure was going to be conducted amongst the study population. Sub-conjunctival anesthesia was used for both the procedures under study. Half cc injection xylocaine with 1:100,000 adrenaline was administered into lesion's head. The pterygium mass and overlying conjunctiva was excised.[17]

As AMG was performedin Group A, the membrane from human placenta was taken after hepatitis B, hepatitis C as well as HIV screening. It was then drenched ingentamycin and fluconazole for about an hour. Bare sclera with calipers was measured and a graft of the similar size was sutured with 10/0 nylon. In Group B, after excision of the pterygium, bare area was measured with calipers. Conjunctival stem cell autograft were acquired from superior limbus and then stitched to the bare are at the limbus.[17]

Topical steroid along with antibiotic drops were prescribed while eye pad was applied for duration of 72 hours. Drops were administered 4 times daily for duration of 1 month and then tapered off. In the post operative period, follow up was done up to 6-months, to see pterygium recurrence. Pterygium recurrence was defined as fibrovascular re-growth crossing limbus by 1 millimeter or more.

All the demographic and clinical data was recorded on a predesigned proforma. SPSS version 21 was used for data analysis. Mean and standard deviations were calculated for quantitative variables while frequency and percentages were estimated for qualitative variables like gender level-2 and level-3 pterygium, complications and recurrence of pterygium. Chi square test was appliedto qualitative variables while independent sample t test was applied to quantitative varibels and p value $\leq$ 0.05 was considered as significant.

RESULTS

Out of a total of 80 patients, there were 44 (55.0%) male and 36 (45.0%) female. Mean age was recorded as 40.73 years with a standard deviation of 8.6 years. Amongst all patients considered for this study, pterygium invasion outside limbus was ranged from 2 to 4mm. Thirty nine (48.8%) patients belonged to pterygium grade 2 while 41 (51.2%) were pterygium grade 3. The characteristics of two groups are compared in Table No.1.

Corneal epithelial defects were noted in almost every patient who took about a week to heal following operation. No corneal staining related to fluorescien was noted in any of the patients. In terms of grafting edema, 1 (2.5%) patient was observed in Group A while there were 5 (12.5%) patients having grafting edema in Group B (p value = 0.090). Hemorrhage was reported in 5 (12.5%) patients of Group A as compared to 2 (5.0%) in Group B (p value = 0.235). Pterygium recurrence was noted in 6 (15.0%) patients of Group A in comparison to 2 (5.0%) in Group B (p value = 0.136) as shown in Table No.2.

Table No.1: Characteristics of Cases with regards to Studied Groups

Characteristics	Group A (n=40)	Group B (n=40)	P Value
Gender			
Male	24 (60.0%)	20 (50.0%)	0.369
Female	16 (40.0%)	20 (50.0%)	
Age in years (mean±SD)	38.42±6.8	41.27±7.4	0.077
Pterygium Grading			
Grade 2	18 (45.0%)	21 (52.5%)	0.502
Grade 3	22 (55.0%)	19 (47.5%)	

Table No.2: Post-operative complications

Post-operative complications	Group A (n=40)	Group B (n=40)	P Value
Pterygium Recurrence	6 (15.0%)	2 (5.0%)	0.136
Grafting Edema	1 (2.5%)	5 (12.5%)	0.090
Hemorrhage	5 (12.5%)	2 (5.0%)	0.235

DISCUSSION

It is an established fact that pterygium is a degenerative and multifactorial entity. Historically, pterygium excision has been accompanied high rates of complication while its recurrence is more dangerous in nature. Trauma along with underlying inflammatory processes have been thought to be the underlying causes of pterygium recurrence.[18,19] In the present

study, out of a total of 80 patients, there were 44 (55.0%) male and 36 (45.0%) female. Mean age was recorded as 40.73 years with a standard deviation of 8.6 years. Thirty nine (48.8%) patients belonged to pterygium grade 2 while 41 (51.2%) were pterygium grade 3. Corneal epithelial defects were noted in almost every patient which took about a week to heal following operation. No corneal staining related to fluorescien was noted in any of the patients. In terms of grafting edema, 1 (2.5%) patient was observed in Group A while there were 5 (12.5%) patients having grafting edema in Group B (p value = 0.090). Hemorrhage was reported in 5 (12.5%) patients of Group A as compared to 2 (5.0%) in Group B (p value = 0.235). Pterygium recurrence was noted in 6 (15.0%) patients of Group A in comparison to 2 (5.0%) in Group B (p value = 0.136). Our results are very well aligned with other local data published recently[17] where a total of 60 cases with pterygium were selected. Mean of the patients was 42 years while majority of the patients (63.3%) were male. In 30 patients, AMG was done and other 30 were performed SCG. The recurrence rate in that study was noted to be 10% following AMG while only 3% in patients with SCG. The current work in also consistent with other studies published previously.[18-20]

A study done by Nakamura and colleagues[21]to find out AMG for the treatment of pterygium noted no recurrence in comparison to 15% recurrence rate which we found with AMG. In the present study, only few patients were reported with complications while both the procedures were associated with an overall rate of complications. Our results are also consistent to what others have found earlier.[22]

In comparison to bare sclera method, conjunctivalautograftis considered to be more demanding technically while competency as well as technique and experience of surgeon performing the procedure are some of the other factors influencing the outcome but conjunctival grafts are known to be associated with better outcomes.[23-25]With stem cell graft, we noted a recurrence rate of pterygium as 5% which is very identical to the work of Mahdy MA et al[26] who got 4.7% recurrence of pterygium fowling a SCG with pterygium excision.

Overall, we noted less recurrence rate of pterygium with SCG in comparison to AMG but the difference between the two could not achieve statistical significance while other complications were also comparable between the two groups.

CONCLUSION

Although in terms of complications and recurrence, no major statistical difference was found in between the two studied group, stem cell graft was associated with less recurrence rate following pterygium excision.

Author's Contribution:

Concept & Design of Study:	Zulfiqar Ali
Drafting:	Nadia Nazir
Data Analysis:	Tariq Mehmood Arain
Revisiting Critically:	Zulfiqar Ali, Nadia Nazir
Final Approval of version:	Zulfiqar Ali

Conflict of Interest: The study has no conflict of interest to declare by any author.

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