Original Article

Comparison of Recurrence after Pterygium Excision with Amniotic Membrane Graft Versus Stem Cell Graft

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Purpose: To compare the recurrence of pterygium with amniotic membrane versus stem cell graft techniques after pterygium excision.

Study Design: Quasi experimental study.

Place and Duration of Study: Study was conducted at DHQ Teaching Hospital, Gujranwala, for duration of 12 Months from July 2016 - June 2017.

Material and Methods: This was a quasi experimental study where two surgical procedures were opted for pterygium excision. The patients were divided into two equal groups. One group had pterygium excision with stem cells grafting and the other group had pterygium excision with amniotic membrane grafting. Patients of both gender, above 18 years of age with grade 2-3 of pterygium causing discomfort, visual impairment or cosmetic disfigurement were included in the study. Whereas patients with id abnormalities, lacrimal sac infection, dry eye syndrome, pseudo pterygium and patients with recurrent epithelial erosions were excluded from the study

Results: Out of 60 patients, 38 (63.3%) were males and 22 (36.7%) were females in this study. The mean age was 42 ± 9.3 years. Recurrence rate with amniotic membrane grafting was 10 % and with stem cell grafting it was 3.3%.

Conclusion: **S**tem cell grafting has less recurrence and better cosmetic appearance than amniotic membrane graft.

Key words: Amniotic membrane graft, Pseudo pterygium, surgical procedures, stem cell graft.

Pterygium is a fibrovascular conjunctival tissue, which invades the cornea[1]. It is three sided in shape and is more often located nasally than temporally[2]. The most common clinical symptoms of pterygium are ocular irritation, hyperemia and vision loss[3]. Conjunctival or limbal auto grafts, amniotic membrane grafts, application of Mitomycin C, post-operative beta irradiation, postoperative Thiotepa application, buccal mucus membrane grafting etc. are major adjuvants for prevention of pterygium recurrence[4-10].

Although many other therapeutic modalities have been proposed[8,11,12], further studies on their efficacy and safety are required. The purpose of this study was to compare the recurrence of pterygium with amniotic membrane versus stem cell graft techniques after pterygium excision. Also, the efficacy and outcomes of pterygium excision were also considered postoperatively.

MATERIAL AND METHODS

This was a quasi experimental study where two surgical procedures were opted for pterygium excision for two groups of patients. Each group comprised of 30 patients. Patients were randomly divided in two groups by using random number table. The treatment

modality in Group A was pterygium excision with amniotic membrane grafting whereas in group B it was stem cell grafting. The venue of this study was DHQ University teaching hospital, Gujranwala. The duration of the study was twelve months starting from July 2016. The patients were selected through non-probability, purposive sampling method. Patients of both gender, above 18 years of age with grade 2 - 3 of pterygium causing discomfort, visual impairment or disfigurement were included in the study. Approval from ethical committee of hospital was taken. Demographic and clinical characteristics were noted for each patient. An informed consent was taken from each patient in which the purpose and procedure was explained and confidentiality of information was ensured.

Both the procedures were done under sub-conjunctival anesthesia. A 0.5 cc injection xylocaine with 1:100,000 adrenaline was given into the head of the lesion. The pterygium mass along with overlying conjunctiva was excised.

In Group A, amniotic membrane grafting was done. The membrane was taken from human placenta after Hep B, Hep C and HIV screening. It was then soaked in antibiotics (gentamycin and fluconazole) for about 1 hour. After taking measurement of the bare sclera with calipers, a graft of the same size was sutured with 10/0 nylon.

In Group B, after excision of the ptergyium bare area was measured with calipers. Then conjunctival stem cell autograft was taken from the superior limbus and stitched to the bare area at the limbus.

At the end of the procedure, a combination of topical steroid and antibiotic drops were prescribed and an eye pad was applied for 72 hours. These drops were used four times a day for 1 month and then tapered off. Follow up was done after 3 days, 2 weeks, 1 month, 3 months and 6 months post operatively for pterygium recurrence (fibro-vascular re-growth crossing limbus by 1 mm or more).

All the collected data was stored electronically & analyzed later by using SPSS version 20. Descriptive statistics were applied to calculate mean and standard deviation. Frequency distribution and percentages were calculated for qualitative variables like gender, level 2 and 3 pterygium. P value less than 0.05 was considered statistically significant.

RESULTS

The mean age was 42 ± 9.3 years. There were 38 (63.3%) males and 22 (36.7%) females in this study. The size of pterygium invasion outside limbus ranged from 2 - 4 mm. The distribution of pterygium grades among groups is given in table 1.

Table 1: Pterygium grades distribution among groups.

Pterygium Grades	Group A	Group B
Grade 2	15 (50%)	12 (40%)
Grade 3	15 (50%)	18 (60%)

All the patients were operated with their allotted surgical treatment and observed postoperatively. Corneal epithelial defects were observed in almost all patients, which healed after one week of operation. No corneal staining with fluorescein was observed in any group, although few complaints like foreign body sensation and watering were seen in some patients of group A & B. None of the patients had grafting edema in group A which was operated with amniotic membrane graft whereas 4 (13.3%) patients had edema in group B which was operated with stem cell graft. The difference between both groups was insignificant ($p > 0.05$) for all complications. The details of other postoperative complications are given in figure 1. In our study, recurrence rate was 10% with amniotic membrane grafting while recurrence rate of 3.3% was seen with stem cell graft. ($p > 0.05$).

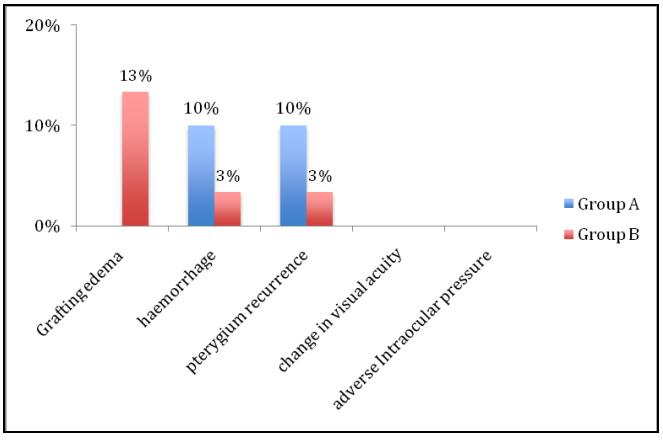

Fig. 1: Postoperative complication of both groups.

DISCUSSION

It is well known that pterygium is a multifactorial disorder, which is degenerative in nature[13-15]. The excision of the pterygium has complications and

recurrence, which is more difficult to control. The underlying recurrence mechanism had been attributed to trauma, inflammation, and proliferation of fibroblasts and deposition of extracellular matrix[16-19]. In our study, we selected 60 patients with pterygium and divided them into two groups of 30 patients each. The age range in the study was 18 to 58 years. The mean age was 42 ± 9.3 years. Maximum patients (65%) presented between ages 34 - 49 years. Among all the patients 38 (63.3%) were males and 22 (36.67%) were females. Among 38 male patients, 19 were treated by pterygium excision with amniotic membrane grafting and other 19 by pterygium excision with stem cell grafting. Female patients were 11 in each group. The recurrence rate following pterygium excision with amniotic membrane graft was found to be 10% and with stem cell graft it was 3%. Among 19 male patients in group A, 2 had recurrence whereas in group B, 1 patient had recurrence while no recurrence was noted in female patients. Recurrence was noted in patients between 39 - 45 years of age. Other published studies support our findings[13-15]. One of the researches claimed a recurrence rate of 27%, which is comparatively very high. The study findings of Nakamura et al[16] recorded no recurrence in follow up period. Moreover, some vision threatening side effects such as scleral ulceration, cataract formation and glaucoma have been reported[20]. In literature many researchers have provided evidence of its functional importance[20]. It is also well known that the conjunctiva and the limbus are important in maintenance and integrity of the corneal epithelium[21]. The current study presents only minor postoperative complications like hemorrhage and graft edema. These results are supported by various available published studies[15,22]. Compared with the bare sclera method, conjunctival autograft is a more technically demanding procedure. Surgeon factors (experience, technique, etc) may have a profound influence on the recurrence rate. Moreover, conjunctival grafts including limbus generally yield better results, because in addition to the contact inhibition effect on residual abnormal tissue by conjunctival graft, the former may also contain limbal stem cells which help to restore the limbal barrier, and this in turn inhibits pterygium recurrence and retards recurrence time[20,23,24]. Soliman and Bhattia reported that there were no recurrences of pterygium growth except in 2 cases (4.75%) following stem cell graft with pterygium excision[25]. The limitation of the study is the small sample size and larger study is needed to assess the safety profile and low recurrence rate of pterygium excision.

CONCLUSION

No major post-operative complications following stem cell graft with pterygium excision were seen in our study. Based on results of our study we recommend that stem cell grafting gives less recurrence and better cosmetic appearance than amniotic membrane graft.

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