Comparison of Amniotic Membrane Transplantation (AMT) with Conjunctival Autografting for the Treatment of Primary Pterygium

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Pterygium is a conjunctival encroachment of the cornea, usually on the nasal side which is found in areas of higher ultraviolet radiation, and in areas with dry, hot, windy, dusty and smoky environments. It is a common eye problem among the rural agricultural workers of tropical countries like India and although it poses no problems with diagnosis it is a difficult condition to treat. Surgical excision is the treatment of choice and many approaches have been tried. After excision the resulting defect can be left exposed, covered by surrounding conjunctiva, covered by a conjunctival autograft, or covered with other tissues. All these methods barring the conjunctival autografts have a high incidence of recurrence. Adjunctive therapy in the form of anti-metabolites have been used to reduce the recurrence rates but these methods are not without their sight threatening post-operative side effects.

Autologous conjunctival grafting seems to be the best method giving low recurrence rates and high safety. Recently attention has been shifted to the use of amniotic membranes as a viable alternative to conjunctival autografts. Several studies have shown amniotic membrane transplantation to be an effective treatment for primary pterygium with recurrence rates and cosmetic results comparable to conjunctival autografts and with the added advantage of preserving the healthy host conjunctiva.

The main aim of treating a pterygium is to prevent its recurrence. This study aimed to find out whether amniotic membranes can be used safely and effectively in the treatment of primary nasal pterygium.

Materials and Methods

Patient Selection: Patients presenting to the Outdoor Patients Department (OPD) of our institute with a primary nasal pterygium were eligible for this study. Approval for the study
was obtained from the Institutional Ethics Committee and informed consent was obtained from all participants regarding the use of cryo-preserved human amniotic membranes. A complete ocular examination was carried out on all patients and the exclusion criteria included: 1) temporal, double headed or recurrent pterygium, 2) previous ocular surgery, 3) any other anterior or posterior segment pathology, 4) age less than 20 years, 5) inability to give informed consent, and 6) inability to come for follow-up.

Technique: Human amniotic membranes were prepared and preserved using the method described by Kim and Tseng, with minor modifications. The head of the pterygium was removed from the surface of the cornea. Subconjunctival fibrous tissue was then completely removed in an area much greater than the pterygium body itself. For conjunctival autografts, a free graft of size similar to the defect area was obtained from the supero-temporal bulbar conjunctiva. For amniotic membrane grafts, the preserved amniotic membrane was removed from the storage medium after thawing and cut into the same size as the defect. Both types of graft were secured, flattened and approximated to the recipient episcleral tissue edge by interrupted 8–0 vicryl sutures.

Follow up: Post-operatively all patients received topical dexamethasone eyedrops that were tapered off by 1 month. Patients were asked to come for follow up on days 1, 7, 14 and thereafter at 6 weeks, 3 months, and 6 months. Since most of the patients were with low literacy levels a simple binominal symptom scoring system was devised. On the first 3 follow up visits patients were asked if they had (absent or present) any pain, redness, photophobia, irritation/foreign body sensation, and watering. According to this score presence of any symptom was marked as 1 and absence as 0 with a maximum score of 5 on each visit and a maximum score of 25 on all five visits. On each visit the patient underwent a complete ocular examination and was particularly examined for positioning of the graft, any associated complications and recurrence.

Statistical Analysis: All quantitative parametric data were analyzed using the unpaired T-test, all qualitative data was analyzed using the Fisher’s exact test and non-parametric data like symptom scores was analyzed by the Mann Whitney U test. A P value of less than 0.05 was considered to be statistically significant.

Results
Forty-six eyes of same number of patients were included in this study with 23 eyes in each treatment group. The ratio of male and female, right and left eyes and age range in the two groups were similar (Table 1). The mean follow-up period was 24.4(range 21 to 27) weeks and 24.8(range 22 to 29) weeks in the conjunctival autograft and AMT groups respectively (P= 0.4). The mean time of surgery in the conjunctival autograft group was 21.7(range 19 to 25, SD 1.8) minutes, whereas for the AMT group it was 21.1(range 17 to 26, SD 2) minutes, and although the time required for the autograft technique was longer this difference was not statistically significant (P = 0.2). The details of the post-operative discomfort scores are given in Table 2. The mean scores were similar on all follow-up days and no statistically significant difference was observed among them. One (4.3%) recurrence was noted in the conjunctival autograft group whereas there were 3(13%) recurrences noted in the AMT group (P=0.35).
Discussion

We found that the duration of surgery and post-operative symptom scores in the two groups to be very similar. Although, use of amniotic membranes was associated with a higher recurrence rate, this was not found to be significantly higher than that in the autograft group. Although some previous studies have reported unacceptably high recurrence rates with the use of AMT in the treatment of pterygium\textsuperscript{4,8} more recent literature suggest that it is as effective as conjunctival autografting for both primary and recurrent pterygium\textsuperscript{6}. The limitations of this study were a small sample size, inability to use a more comprehensive symptom scoring method, and a short follow-up period of 6 months.

The main advantage of using amniotic membranes appears to be preservation of the healthy conjunctiva. Because of the risk of compromising the outcome of filtering glaucoma surgery should it be required in the donor eye, and relative scarcity of healthy conjunctiva in patients with extensive involvement and double headed pterygium, an alternative tissue source had been sought. The disadvantage of using amniotic membranes is the risk of transmission of viral and prion disease, and although this has not been clinically reported strict quality control measures should be ensured while preparing amniotic membranes. Larger randomized control trials including both primary and recurrent pterygia need to be undertaken to further explore the scope of this promising therapeutic technique.

References