

EFFECTIVENESS OF AUTOLOGOUS BLOOD FOR ADHERENCE OF LIMBAL CONJUNCTIVAL AUTOGRAFT IN PTERYGIUM SURGERY

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Abstract

Background: The usage of autologous blood as an adhesive agent for the limbal conjunctival graft fixation in pterygium study has increased in the recent years due to its effectiveness and easy procurement. The objective is to estimate the effectiveness of limbal conjunctival autograft using autologous blood. **Materials and Methods:** It was an observational study on patients operated for Pterygium in the department of ophthalmology. The patients satisfying inclusion criteria were examined pre-operatively and then underwent surgery for Pterygium wherein Autologous blood was used to fix the limbal conjunctival autograft. The patients were examined post-operatively for Pain (VAS), improvement in Refractive status and complications in terms of subconjunctival hemorrhage, corneal edema, graft edema, graft displacement, loss of graft and granuloma formation. **Result:** Patients undergoing the surgery for Pterygium wherein the effect of autologous blood in adherence of limbal conjunctival autograft were studied showed that this technique was effective and cost effective with a smaller number of complications. **Conclusion:** The use of Autologous blood for adherence of Limbal conjunctival autograft is proven efficacious with minimal postoperative complications.

INTRODUCTION

A fibrovascular growth, and an elastotic degeneration of the subconjunctival tissue are all terms used to characterize pterygium. There are several origins, but the most satisfactory etiology is UV-B sun exposure.^[1] In a risk analysis study recently conducted in Australia, Mackenzie et al. those subjects who spent their first 5 years of life at latitudes less than 30° had almost 40 times the risk of pterygium growth than those living at latitudes greater than 40° and had 20 fold increased risk for development of pterygium if they had spent most of their time outdoors.^[2] They also found wearing regular spectacle eyeglasses, dark sunglasses, hats had very strong protective effect against pterygium growth.^[2] The prevalence rate of pterygium in the central part of Manipur was found to be 12.5%.^[3] Astigmatism-related visual blurring may also result from an early degenerative pterygium. Grade 1 to 3 are used to categorize pterygium. Grade 1 designates pterygium just crossing the limbus. Grade 2 is a pterygium crossing the midway between limbus and pupillary margin. Pterygium in grade 3 crosses the pupillary margin.^[4] Nasal pterygium is the most common (60%), followed by temporal (20%), double

(20%), bilateral and recurrent. Dryness, headache, and the sensation of a foreign body are the common symptoms. Tear-film instability leads to dryness. Untreated astigmatism is the cause of headache. Chronic degenerative pterygium can pass across the pupillary area of the cornea and can cause visual axis blockade. At this point, surgical excision will leave a significant amount of corneal opacity, impairing vision permanently. Pterygium has to be dealt with in a basic yet standard manner. The surgical approach remains to be the mainstay of treatment. In pterygium treatment, there is a range of surgical and adjuvant options. Recurrence rates for simple excision with bare sclera method ranges between 23 and 75 percent.^[5-11] The limbal stem cell epithelium is a natural barrier that prevents the conjunctiva from developing onto the cornea.^[12] Since then, several reports have shown that limbal stem cell epithelium may be successfully replaced after pterygium excision.^[13-16] Limbal conjunctival autograft, on the other hand, has a recurrence rate of 1.9% to 4%.^[17,18] Pterygium excision and limbal conjunctival autograft with suture method has a high recurrence rate because of the risk of dissemination of parvovirus B-19 virus (12%).^[19-21] A granuloma may occur as a result of a suture procedure, which takes longer to

heal and causing scar. Other issues with the suture technique include large papillary conjunctivitis and postoperative pain.^[22-24] A limbal conjunctival autograft or an amniotic membrane can be used with fibrin-based adhesives that have biological and biodegradable properties and are less prone to irritation. Therefore, it is an improvement over the suture technique.^[25]

To avoid issues associated with sutures and fibrin glue, the current research uses patients' blood at the recipient's scleral bed to examine the progression of complications, since autologous blood is safe.

MATERIALS AND METHODS

A prospective study was done in the Department of Ophthalmology, Jawaharlal Nehru Institute of Medical Sciences Hospital, Manipur. This study was conducted for a duration of 2.5 years starting from 2022. All pterygium patients with stage 1 and above, of both sexes of all ages admitted in the department during the study period were enrolled as study participants. Patients with recurrent pterygium, ocular surface infection, bleeding disorders, patients on anticoagulants, non-compliance and patients uncertain to come back for follow-up examinations were excluded.

A pre-designed proforma was used to record the patients' baseline socio-demography status, clinical and laboratory findings. Under standard hospital protocol, surgery was done using patients' blood at the recipients' scleral bed. Post-operatively, the patients were followed-up weekly for six weeks and the outcomes were recorded. Microsoft Excel was used to input the acquired data, and SPSSv20 was

used to analyse it. Only descriptive analysis was done by using percentages and proportions.

Ethical approval for the study was obtained from IEC, JNIMS. A written informed consent was taken from the study participants. Patients' privacy and data confidentiality were maintained.

RESULTS

Completed data sets from 52 individuals with degenerative pterygium that had developed beyond the limbus, could be collected. It was equally distributed among the two sexes. Majority of them (32; 61.54%) were from the age-group of 35-45 years whereas, the remaining were from the age-group of 46-60 years. Majority of the cases (50; 96.15%) Grade II pterygium while the remaining 02 (3.85% patients had Grade III pterygium

Almost all the patients (50; 96.15%) presented with ocular discomfort. Visual disturbance and could be detected in 33 of them (63.46%). More than half of them (31; 59.62%) had both visual disturbance and ocular discomfort. Only 12 cases (23.08%) purely presented for cosmetic purpose [Table 1].

Before the treatment, 01 patient (1.92%) had an Uncorrected Visual Acuity (UCVA) of 6/18. 04 (7.69%) had a UCVA of 6/12. Two-thirds of the patients (32; 61.54%) had a UCVA of 6/9 while the remaining 15 (28.85%) patients had normal VA.

Only 02 (3.85) of the 52 patients had pupillary axis involvement. More than half of the patients (30; 73.33%) had pre-existing astigmatism as their refractive status. Out of those having astigmatism, 22 (73.33) were with the rule of astigmatism and 04 each (13.33%) were against the rule of astigmatism and irregular astigmatism.

Table 1: Distribution of patients by complaints

Complaints	N (%)
Ocular disturbance	50 (96.15)
Visual disturbance	33 (63.46)
Visual & ocular disturbance	31 (59.62)
Cosmetic purpose only	12 (23.08)

Table 2: Distribution of patients by UCVA

UCVA	Pre-operative (%)	Post-operative (%)
6/6	15 (28.85)	19 (36.54%)
6/9	32 (61.54%)	33 (63.46)
6/12	04 (7.69)	-
6/18	01 (1.92)	-

Post-operatively, only 05 (9.62%) patients had local pain on POD-1 which disappeared on POD- 1 week onwards. The comparison between Pre-op UCVA and Post-op UCVA is depicted below. No patients remained on UCVA of 6/12 or more after the surgery. Also, the proportion of normal VA increased from 28.85% to 36.54%.

Regarding complications, 04 (7.69%) patients had sub-conjunctival hemorrhage on POD – 1 and 01 patient had sub-conjunctival hemorrhage on week 1. The remaining 47 (90.39%) did not have any

complications. Graft displacement was detected in a single patient (1.2%) on POD-1.

DISCUSSION

A total of 52 patients diagnosed to have Pterygium were included in the study and the Grading was assessed. They were observed under the sections of age, gender, complaints. Visual acuity of the patients was recorded. The refractive errors of each patient pre-operatively was measured. The patients underwent surgery. Post-operatively pain,

complications and refractive error were studied on POD 1, POD week -1, POD week – 6.

More number of young patients were detected with Pterygium in the age group of 35-45 years were (32; 61.54%) as compared to 20 patients (38.46%) in the age group of 46-60 years. The results show quite a difference to those found in the Vinay Nangia et al study (798 eyes of 608 subjects) where the prevalence of pterygium was 6.7% in the age group of 30-39 years and 13.5% among those aged 50-59 years.^[26] In this study, there was no gender dominance noted. In contrast to this study, Vinay Nangia et al study shows significant association with older male gender ($P < 0.001$).^[27] This may be a chance finding. Also, difference in the prevalence of pterygium may vary depending upon different study places. About 33 patients (63.46%) had visual disturbances and 50 patients (96.15%) had ocular discomfort 31 patients (59.62%) complained to have both visual and ocular disturbances whereas 12 patients (23.08%) wanted to get operated for cosmetic reason. Das Anthony et al's study (1,610,843 eyes) showed similar presenting complaints with 45.6% patients presenting with visual disturbances, 40.1% presenting with ocular discomfort and 9.1% presenting with cosmetic reasons.^[28]

About 32 patients (61.54%) had an UCVA of 6/9 and 15 patients (28.85%) presented with an UCVA of 6/6. Only 1 patient (1.92%) had an UCVA of 6/18 and 4 patients (7.69%) had an UCVA of 6/12. Thus, the majority of the patients had their visual acuity 6/9 at presentation. Around 15 patients had near perfect vision at the time of presentation. Of the 52 patients, 2 patients (3.85%) had pupillary axis involvement. 30 patients (57.69%) had pre-existing astigmatism. 22 patients (42.31%) had no astigmatism. Das Anthony et al⁴⁴ (1,610,843 eyes) showed 19.5% subjects with astigmatism. These results indicate the effect of pterygium on corneal curvature. Out of the 30 patients with pre-existing astigmatism, 22 patients (73.33%) had with the rule of astigmatism, 4 patients (13.33%) against the rule of astigmatism, 4 patients (13.33%) had irregular astigmatism. Around 50 (96.15%) patients had GRADE 2 Pterygium and 2 (3.85 %) patients had GRADE 3 Pterygium. Most of the patients presented with Grade 2 Pterygium and above. Das Anthony et al study (1,610,843 eyes) included pterygium grades I-III and showed 21% subjects with Grade 2 pterygium and 0.6% patients with Grade 3 pterygium.^[28] Post-operatively, patients did not experience much pain. Only 05 patients had pain on POD-1 only. Contrary to this study, Pastor et al found 52.9% subjects presenting with pain on POD-1.^[29] Post-operative period for most of the patients was uneventful except for 4 (7.69%) patients who had sub-conjunctival hemorrhage out of which one Patient had persistent SCH on POD – week 1. None of the patients had SCH post week 1 after Surgery. A single (1.92%) patient presented with graft displacement on POD-1. Other graft related complications and cornea related complications were

not seen among the patients post operatively. These complications included graft edema and loss of graft. In contrast Shreesha K Kodavoor et al study (2356 eyes) showed 38.7% subjects with SCH, 0.38% with graft displacement and 0.16% with granuloma formation.^[30] None of the patients had granuloma formation either after surgery. From the above-mentioned data, it can be deduced that this technique of using, autologous blood as an adhesive for the limbal conjunctival graft is efficacious.

CONCLUSION

We have deduced the effectiveness of autologous blood for adherence of limbal conjunctival autograft in pterygium surgery through this study, thus proving it to be an effective adhesive agent.

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