



Long-Term Efficacy of Autologous Blood in Preventing Recurrence After Pterygium Surgery: A 10-Year Retrospective Study

Autologous blood a saviour in preventing pterygium recurrence

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KEYWORDS

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ABSTRACT:

Introduction and Aim:

Pterygium, derived from the Greek word "pterygion," meaning "wings," is a common ocular condition characterized by conjunctival tissue growth onto the cornea, often leading to recurrence after surgical excision. Traditional techniques for pterygium surgery are associated with recurrence rates as high as 80%. This study aims to evaluate the long-term effectiveness of a novel technique using autologous blood as an adhesive agent for conjunctival autografts in preventing recurrence after pterygium surgery.

Materials and Methods:

A total of 22 eyes from 22 patients with varying grades of pterygium were randomly selected to undergo pterygium excision with conjunctival autograft using autologous blood as the adhering agent. Following ethical approval, surgeries were performed between June 2012 and June 2013. Patients were followed up postoperatively at Day 1, 1 week, 3 weeks, 6 months, and 1 year. A retrospective evaluation for recurrence was conducted after 10 years, with no loss to follow-up. All procedures were performed by a single surgeon, and postoperative assessments were conducted by a single evaluator to minimize bias.

Results:

During the ten-year follow-up, all patients demonstrated successful healing of the conjunctival autograft. Notably, there were no signs of pterygium recurrence in any patient. One patient experienced subgraft hemorrhage at the one-week follow-up, which resolved by three weeks without further complications.

Conclusion:

The use of autologous blood as an adhesive agent for conjunctival autografts after pterygium excision appears to be an effective technique for preventing recurrence. This method offers additional advantages such as shorter surgical time, improved patient compliance, and cost-effectiveness. This



study represents one of the longest follow-ups reported in the literature on the use of autologous blood in this context, underscoring its potential as a viable alternative in pterygium surgery.

Introduction: Pterygium, a common ocular disorder, is prevalent in several parts of the world with an incidence rate ranging from 0.3% to 29%. [1,2] The treatment of choice is surgical excision. However, the techniques of pterygium excision (bare sclera technique or Mc Reynolds operation) were associated with high recurrences of nearly 80 percent [1] Hence, techniques with less recurrence were developed, which include conjunctival autograft, limbal and limbal–conjunctival transplant, conjunctival flap and conjunctival rotation autograft surgery, amniotic membrane transplant, cultivated conjunctival transplant, and other adjunctive therapies. [1] Among these, conjunctival autograft has been advocated as the most popular treatment modality in the surgical management of recurrent pterygia. [1,3,4] Some of the complications after pterygium surgery include recurrence, graft loss, granuloma formation, malignancy. Amongst these recurrence is the most common complication. The recurrent lesion is usually more aggressive. Antimetabolites or other adjuvant therapies, such as beta radiation, reduced the incidence of recurrence to 4-43% [5] Adjunctive therapies aimed to prevent recurrence include application of antimetabolites such as mitomycin C, radio-therapy, conjunctival or limbal conjunctival auto graft and amniotic membrane graft [6-9]. Some of the ways of attaching the graft are with sutures and fibrin glue. Autologous fibrin as an adhesive was introduced as a more economic and compliant option. In autologous fibrin, the fibrinogen is synthesized from patient's own blood in contrast to fibrin adhesive, where the fibrinogen is synthesized from pooled donor plasma. [1] The use of autologous blood as an adhesive is hypothesized to reduce recurrence by enhancing graft integration and minimizing foreign body reaction.

Aim of the study: To evaluate the effectiveness of using autologous blood—a novel technique in attaching conjunctival autograft after pterygium surgery in preventing recurrence.

Methodology: 22 eyes of 22 patients with different grades of pterygium were enrolled by randomization using envelope technique to undergo pterygium excision

with conjunctival autograft which was placed using autologous blood as an adhering agent after ethical clearance from the ethical committee of the Institute. These patients operated between 2012 June to 2013 June were followed up on Day 1, 1 week, 3 weeks, 6 months and 1 year each time recording visual acuity, slit lamp evaluation for graft integrity, signs of recurrence based on regrowth of pterygium tissue over the cornea and any other complications. Later they were retrospectively followed up after 10 years by a telephonic call and examining under slit lamp and analysing signs and symptoms to assess for any signs of recurrence. There was no loss to follow up. All the patients were operated by a single surgeon and post operatively evaluated by a single person to avoid bias. Exemption from study was for patients with history of ocular surface infections, ocular trauma, bleeding abnormalities and on anticoagulant therapy. A detailed anterior segment examination was performed using slit lamp biomicroscope to diagnose pterygium with respect to grade, type, and site. Pterygium was graded according to Tan et al classification. [10] Pterygium was labeled nasal or temporal based on the location, while patients with both nasal and temporal pterygium in the same eye were diagnosed as “Double Headed pterygium”.

A single experienced surgeon performed all the surgeries under an operating microscope, to avoid bias.

All patients were followed-up regularly: day 1, 1st week, 3rd week, and 6th month and after 10 years to assess for any signs of recurrence. Mean and standard deviations were used to describe age and BCVA and qualitative variables like recurrence were presented as frequency and percentage. Chi square test was used to compare the qualitative outcomes i.e. recurrence as per operational definition. Post stratification chi square test was applied. The p-value of ≤ 0.05 was considered significant.

Results: A total of 22 patients with mean age 50.5 years and SD of 14.81 years, having 40.9% males & 59.1% females as shown in Table 1 were operated for pterygium excision with conjunctival autograft using autologous blood.



In all cases, the pterygium was successfully removed, the conjunctival autograft healed well though one case had sub graft hemorrhage (Figure1) at 1 week follow up which disappeared at 3 weeks. There was no dehiscence and graft dislocation. We did not observe any recurrence of the disease in any of our patients during the entire follow-up period of 10 long years as shown in Table 2

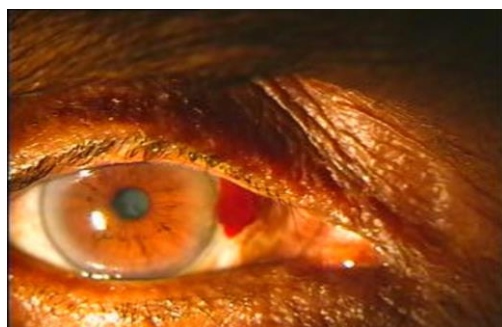
Table 1: Demography

Demographic characteristics and laterality		
Sex (%)	Male	40.9
	Female	59.1
Laterality (%)	Right	45.5
	Left	54.5
Grade (%)	Grade 1	4.5
	Grade 2	90.9
	Grade 3	4.5
Age (years)	Mean	50.55
	SD	14.82

Table 2: Recurrence rate after 10 years follow up

	Number
Total patients operated	22
Recurrence after 10 years follow up	0

Figure 1: Subgraft hemorrhage



Discussion:

Pterygium is a degenerative conjunctival disease that has been known for over 3000 years.[6] The term pterygium comes from the Greek word pterygion, which means "small wing".[6] Among the first authors to mention the disease and its surgical solution were Hippocrates, Celsus, Pallus and Sushruta.[11] The most common complication of pterygium surgery is recurrence which is very frustrating both to the patient and the surgeon. Historically, it has been treated with simple surgical excision; however, this method has shown up to 80% recurrence.[12] Therefore, classical surgery was gradually combined with the new methods of applying antimetabolites or anti-VEGF. Another way is to replace the tissue with an amniotic membrane or a healthy conjunctival autograft to the defect site, which competitively prevents the return of the disease.[13] There are works that mention femtosecond laser-assisted surgery in graft preparation[14,15] Graft fixation is classically performed using suture or tissue glue. An alternative to glue is autologous blood.[16]

In a prospective study Uy et al. verified the comparable effectiveness of suture fixation and fibrin glue in 11 eyes in each group, and did not detect recurrence in any patient.[17]. In a comparable size group, Kheirkhah et al. reported 2 cases of recurrence out of 21 patients.[18] Bilge described 1 recurrence of 21 eyes operated on by this technique.[19] Akbari et al. reported recurrent pterygium in only one case out of 30.[20] Hirst in a large group of patients observed only 1 recurrence out of 1000 eyes operated on.[21] In the present study also we did not have any recurrence and the studies in literature also have a similar optimistic results. These studies and our long-term results are similar in the frequency of pterygium recurrence. The findings of this study were in agreement with a study conducted in Nepal to assess efficacy of sutureless and glue free conjunctival limbal autograft, which revealed 2.5% recurrence after this method.[22] According to a study conducted at ophthalmology department, Khyber teaching hospital Peshawar, comparison of different methods of pterygium excision revealed 8.8% recurrence after free conjunctival auto graft with sutures.[23] Sirisha et al evaluated the advantages of autologous blood for attaching conjunctival autograft after pterygium excision and recorded that out of 50 patients, there were no intra operative complications. 4% patients had lost their grafts



while 2% had graft retraction. Pterygium recurrence was seen in only one patient. They concluded that this technique is safe, effective and free of adverse reactions associated with glue and sutures.[24] The disadvantage with this method is loss of graft but we did not notice a single graft loss. Some complications we observed in the follow up period other than recurrence were sub graft hemorrhage, cystic degeneration at the excised site which resolved in the later follow up periods with topical medications.

The study by Hirst LW et al[21] helps contextualize the importance of exploring new techniques like autologous blood use in surgery. The study by Kheirkhah A, Nazari R, Abedini F, et al[18] compares the use of fibrin glue and sutures for graft fixation in pterygium surgery, highlighting the potential benefits of using autologous materials. The study by Sirisha K, Kumar T, Sharma P, et al.[24] investigates the use of autologous blood for conjunctival graft fixation, reporting on its safety and effectiveness. It provides empirical evidence for the use of autologous blood as an alternative to traditional adhesives.

Conclusion: Recurrence following pterygium excision is the main disadvantage of the surgery. In the above study we concluded that recurrence of pterygium can be reduced even with the novel technique of using autologous blood as an adhering agent for the conjunctival graft, in addition to its added advantages of lower cost, infections, shorter operating time and better compliance for the patients. This study is also one of the longest follow up period for autologous blood to prevent recurrence presented in literature. Some limitations of the present study were smaller sample size.

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