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A Randomized Controlled Trial Comparing Sutures versus Autologous Blood for Graft Fixation in Pterygium Surgery Using Conjunctival Limbal Autograft

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Abstract

Purpose: To evaluate and compare the clinical outcomes of conjunctival limbal autograft (CLAU) fixation using autologous blood versus sutures in patients undergoing pterygium excision.
Methods: A prospective, randomized controlled trial was conducted involving 120 patients with primary nasal pterygium. They were divided into two equal groups: Group A (n=60) received CLAU fixation using 8-0 vicryl sutures, and Group B (n=60) had the graft secured using the patient's own fresh blood. Patients were assessed for postoperative discomfort, healing time, recurrence, inflammation, cost, and complications over a 6-month follow-up period.
Results: Group B showed significantly better patient comfort, reduced inflammation, faster epithelial healing, and greater cost-effectiveness. Recurrence was slightly lower in Group B (1.6%) compared to Group A (3.3%).
Conclusion: Autologous blood is a safe, effective, and economical alternative to sutures for CLAU fixation in pterygium surgery with comparable recurrence rates and superior patient tolerance.

Keywords: Pterygium, Conjunctival limbal autograft, sutures, blood

INTRODUCTION

Pterygium is a wing-shaped fibrovascular growth originating from the conjunctiva and encroaching onto the cornea, often associated with chronic ultraviolet exposure, dryness, and inflammation. It can lead to astigmatism, visual impairment, and ocular discomfort. Surgical excision is the main treatment modality, especially when the lesion becomes symptomatic or cosmetically unacceptable.

Among surgical techniques, conjunctival limbal autografting (CLAU) has been widely accepted for its lower recurrence rates compared to bare sclera and amniotic membrane graft techniques. Traditionally, sutures have been used to fix the graft in place; however, they are often associated with postoperative discomfort, prolonged surgical time, and inflammation. Alternatives like fibrin glue have been introduced to reduce these issues, but the cost remains a barrier in resource-limited settings.

Recent innovations have explored using fresh autologous blood for graft fixation, which leverages the body's natural clotting mechanism to secure the graft without foreign materials. This study was conducted to compare the efficacy and outcomes of CLAU fixation using autologous blood versus sutures in a randomized controlled trial format.

MATERIALS AND METHODS

Study Design and Population:

This was a prospective, randomized controlled trial conducted at a tertiary care center (FHMC AGRA) over a period of 18 months. A total of 120 patients with primary nasal pterygium were enrolled. Inclusion criteria included age between 20–60 years, no prior ocular surgery, and absence of systemic conditions affecting wound healing.
Randomization and Groups:
Patients were randomly assigned into two groups (n=60 each):
Group A: CLAU fixed with 8-0 vicryl sutures.
Group B: CLAU fixed using fresh autologous blood.

Surgical Procedure:
All patients underwent surgery under peribulbar anesthesia. After pterygium excision, a graft of appropriate size was harvested from the superior bulbar conjunctiva including limbal stem cells. In Group A, the graft was secured with interrupted 8-0 vicryl sutures. In Group B, the graft was allowed to adhere by gently pressing it over the scleral bed using fresh blood oozing from the surgical site, held for 10–15 minutes.

Postoperative Care and Follow-up:
Patients received topical moxifloxacin 0.5% and prednisolone acetate 1% eye drops tapered over 4 weeks. Follow-ups were scheduled at day 1, week 1, month 1, 3, and 6 postoperatively.

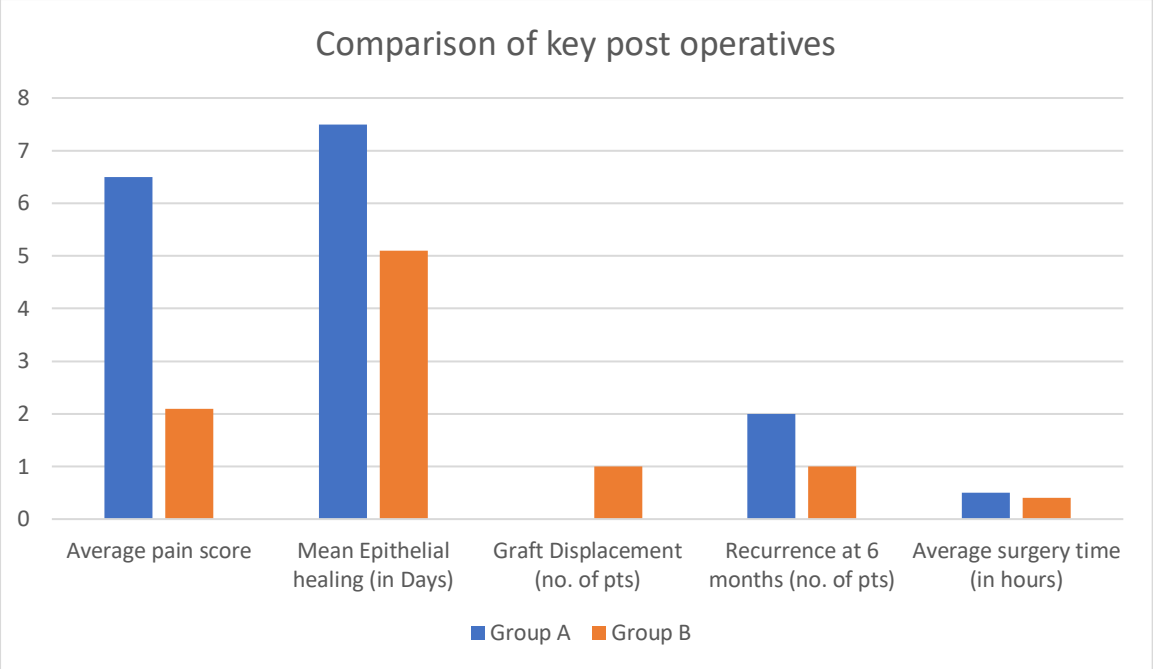
Parameters Assessed:
• Patient comfort (foreign body sensation, pain scores)
• Redness and watering
• Healing (epithelialization time)
• Graft displacement
• Recurrence
• Cost-effectiveness

RESULTS
Demographics:
There were no significant differences in age or sex distribution between the two groups.

Clinical Outcomes:

- **Comfort:** Group B reported significantly better comfort (foreign body sensation: 8% vs 35%, pain scores: average 2.1 vs 4.3).
- **Inflammation:** Reduced in Group B (12%) compared to Group A (30%).
- **Healing:** Average epithelialization time was faster in Group B (5 days) than Group A (8 days).
- **Graft Displacement:** One case noted in Group B.
- **Recurrence:** 3.3% (2 cases) in Group A vs 1.6% (1 case) in Group B.
- **Cost:** Group B significantly more economical due to sutureless technique.

Parameter	Group A (Sutures)	Group B (Autologous Blood)	p-value
Average pain score (Day 1)	6.5	2.1	<0.001
Mean epithelial healing (days)	7.5 ± 1.3	5.1 ± 1.0	<0.01
Redness & watering (1st week)	High	Mild	<0.01
Graft displacement	0	1 (1.6%)	NS
Recurrence (at 6 months)	2 (3.3%)	1 (1.6%)	NS
Average surgery time (minutes)	35 ± 5	25 ± 3	<0.001
Cost of materials per surgery	Moderate	Minimal	<0.001



DISCUSSION

The use of autologous blood for conjunctival autograft fixation in pterygium surgery offers several advantages. Our findings are consistent with those of Koranyi et al. and Sharma et al., who also reported improved comfort and reduced inflammation with sutureless techniques. While fibrin glue serves a similar purpose, its cost and potential for immunologic reactions or infections limit widespread use.

Autologous blood, being biocompatible and readily available, acts as a natural adhesive. Our recurrence rate of 1.6% in the fresh blood group aligns with published literature and supports its efficacy. Moreover, the technique significantly reduces operative time and avoids foreign body-induced irritation.

One case of graft displacement in Group B was observed, emphasizing the need for meticulous surgical technique and adequate postoperative immobilization. Long-term studies may further clarify recurrence trends beyond 6 months.

CONCLUSION

This randomized controlled trial confirms that autologous blood is a viable and effective alternative to sutures for conjunctival limbal autograft fixation in pterygium surgery. It offers excellent patient comfort, faster healing, reduced cost, and comparable recurrence rates. This technique is especially suitable for high-volume surgeries in cost-sensitive environments.

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