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Original Research

# Comparative evaluation of efficacy of Fibrin glue and sutures for conjunctival autografting in patients undergoing pterygium surgery

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## ABSTRACT:

**Background:** This research was conducted to evaluate the comparative effects of fibrin glue and sutures on clinical outcomes in patients who underwent pterygium excision accompanied by conjunctival autografts.

**Materials & methods:** Sixty patients scheduled for pterygium surgery participated in this study. Comprehensive demographic and clinical information were collected for all participants. Following a brief assessment of ocular issues and the exclusion of any local or systemic contraindications to surgery, the patients were categorized into two groups, each consisting of 30 individuals, to receive either sutures or fibrin glue. In Group A, the pterygium was excised, and a conjunctival autograft was secured using vicryl sutures. Group B underwent postoperative follow-up, during which the patients were evaluated and compared. Statistical analysis was performed utilizing SPSS software.

**Results:** Significant results were obtained while comparing the patient discomfort on first and 10<sup>th</sup> postoperative day among patients of the suture group and glue group. Sub conjunctival hemorrhage was seen in 13.34 percent of the patients of the suture group and in 3.34 percent of the patients of the glue group. Occurrence of sub-conjunctival hemorrhage was significantly higher in the suture group.

**Conclusion:** In the context of pterygium surgery, the application of fibrin glue for securing the free conjunctival autograft leads to an expedited recovery, reduced pain, and a lower incidence of complications. **Key words:** Fibrin glue, Pterygium, Suture

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## INTRODUCTION

Primary pterygium is a prevalent ocular condition that impacts a significant portion of the population, particularly those residing in regions between the Tropics of Cancer and Capricorn.<sup>1</sup> The incidence is notably elevated in areas characterized by high ultraviolet radiation or in hot, arid, windy, dusty, and smoky environments.<sup>2</sup> Additionally, genetic predispositions contribute to its occurrence.<sup>3</sup>

The reported prevalence of pterygium varies widely, with estimates ranging from 0.7% to 31%. Surgical intervention remains the preferred treatment modality. Historically, the surgical approach to pterygium involved the excision of the excessive tissue covering the cornea and adjacent sclera, often resulting in a substantial area of bare sclera. However, the recurrence rate of pterygium was alarmingly high, reaching up to 89% in some studies.<sup>4</sup> To enhance surgical outcomes, two primary strategies have been implemented: the destructive approach, which augments the excision effect through radiation and chemotherapy (including mitomycin C (MMC), thiotepa, 5-fluorouracil, and beta-irradiation), and the reconstructive approach, which involves the transplantation of various tissue grafts such as conjunctival autografts, amniotic membrane transplants, mucous membrane grafts, and conjunctival limbal transplants.<sup>5,6</sup>

Hence; this study was conducted to compare the effect of fibrin glue versus sutures on clinical outcomes in patients undergoing pterygium excision and conjunctival autografts.

#### **MATERIALS & METHODS**

This study was carried out in the ophthalmology department to evaluate the effectiveness of fibrin glue compared to sutures in terms of clinical outcomes for patients undergoing pterygium excision and conjunctival autografts. A total of 60 patients scheduled for pterygium surgery participated in this research. Comprehensive demographic and clinical information was collected for all participants. Following a brief medical history related to ocular issues and the exclusion of any local or systemic contraindications to surgery, the patients were allocated into two groups, each consisting of 30 individuals, with one group receiving sutures and the other fibrin glue. **Group A:** The pterygium was excised and conjunctival autograft was sutured with vicryl sutures. **Group B:** Excision of primary pterygium with conjunctival autografting was done using fibrin glue. The surgical site and its surrounding area underwent routine antiseptic cleaning using swabs soaked in 5% betadine. The grafted tissue was secured with continuous vicryl sutures, which included four interrupted sutures in group A, whereas in group B, the grafted tissue was adhered using fibrin glue. A postoperative follow-up was conducted, during which patients were assessed and compared. Patient comfort was rated on a scale from 0 to 3, with 0 indicating the highest level of comfort and 3 indicating the highest level of discomfort. Statistical analysis was performed utilizing SPSS software.

## RESULTS

The average age of patients in the suture group was 42.1 years, while in the glue group it was 47.4 years. The mean surgical duration for the suture group was 23.4 minutes, compared to 14.3 minutes for the glue group, with the differences being statistically significant. Notable differences were also observed in patient discomfort levels on the first and tenth postoperative days between the two groups. Subconjunctival hemorrhage occurred in 13.34% of patients in the suture group, whereas it was present in only 3.34% of those in the glue group, indicating a significantly higher incidence in the suture group.

Patient discomfort	Suture group		Glue Group		p- value
	Ν	%	Ν	%	
Grade 0	0	0	0	0	0.000
Grade 1	20	66.6	26	86.6	(Significant)
Grade 2	08	26.6	4	13.4	
Grade 3	02	6.7	0	0	
Total	30	100	30	100	

Table 1: Distribution of patients according to postoperative patient discomfort at first day

Table 2: Distribution of patients according to postoperative patient discomfort at day 10

				2	
Patient discomfort	Suture group		Glue Group		p- value
	Ν	%	Ν	%	
Grade 0	25	83.34	28	93.34	0.000
Grade 1	5	16.66	02	06.66	(Significant)
Grade 2	0	0	0	0	
Grade 3	0	0	0	0	
Total	30	100	30	100	

Table 3: Mean time to secure graft in bed

Mean time to secure graft	Suture group	Glue Group	p- value
in bed			
Mean	23.54	14.3	0.001 (Significant)
SD	4.2	3.7	

#### Table 4: Complications

Sub-conjunctival	Suture group		Glue Group		p- value
hemorrhage	Ν	%	Ν	%	
Present	4	13.34	1	3.34	0.000
Absent	26	86.66	29	96.66	(Significant)

#### DISCUSSION

Pterygium, a common ocular disorder, is prevalent in several parts of the world with an incidence rate ranging from 0.3% to 29%.<sup>7</sup> Although various anti-inflammatory drugs and lubricants are available to reduce the discomfort, surgical intervention is the only ultimate choice opted for pterygia.<sup>8</sup> However, the techniques of pterygium excision (bare sclera technique or Mc Reynolds operation) were associated with high recurrences.

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. Among these, conjunctival autograft has been advocated as the most popular treatment modality in the surgical management of recurrent pterygia.<sup>9,10</sup>

Surgery remains the main treatment option. The main indications for pterygium removal are deterioration of vision due to pterygium enlargement, increased astigmatism, or recurrent inflammation. The aim of surgery is to remove the lesion and avoid regrowth. Surgical techniques include the bare sclera technique, conjunctival autograft, amniotic membrane graft, and conjunctival-limbal graft. Treatment also includes adjuvant therapy in the form of antimetabolites, antiangiogenic agents, and radiation.<sup>11-13</sup>

The average age of patients in the suture group was 42.1 years, while in the glue group it was 47.4 years. The mean surgical duration for the suture group was 23.4 minutes, compared to 14.3 minutes for the glue group, with the differences being statistically significant. Notable differences were also observed in patient discomfort levels on the first and tenth postoperative days between the two groups. Subconjunctival hemorrhage occurred in 13.34% of patients in the suture group, whereas it was present in only 3.34% of those in the glue group, indicating a significantly higher incidence in the suture group.

Pan HW et al<sup>14</sup>, in a previous study, searched Medline, EMBASE, Web of Science, Cochrane Central Register of Controlled Trials, and Google Scholar for relevant randomized controlled trials (RCTs). The methodological quality of all the included trials was assessed with the Jadad score. The meta-analysis was performed with the fixed-effects model for complication rate and recurrence rate, and random-effects model for operating time. Fibrin glue was associated with a significantly decreased operating time and was more effective in reducing the recurrence rate compared with suture. There were no significant differences in the complication rate between the 2 groups. Their meta-analysis supported the superiority of fibrin glue to suture in pterygium surgery with conjunctival autografting in that the use of fibrin glue can significantly reduce the recurrence rate without increasing the risk of complications.<sup>14</sup>

Romano V et al<sup>15</sup> assessed the effectiveness of fibrin glue compared to sutures in conjunctival autografting for the surgical treatment of pterygium. Our primary outcome was recurrence of pterygium defined as any re-growth of tissue from the area of excision across the limbus onto the cornea. The secondary outcomes were surgical time and complication rate. We graded the certainty of the evidence using GRADE. We included 14 RCTs conducted in Brazil, China, Egypt, India, Malaysia, New Zealand, Philippines, Saudi Arabia, Sweden and Turkey. The trials were published between 2004 and 2016, and were assessed as a mixture of unclear and low risk of bias with three studies at high risk of attrition bias. Only adults were enrolled in these studies. Using fibrin glue for the conjunctival autograft may result in less recurrence of pterygium compared with using sutures (risk ratio (RR) 0.47, 95% CI 0.27 to 0.82, 762 eyes, 12 RCTs; low-certainty evidence). If pterygium recurs after approximately 10 in every 100 surgeries (95% CI 2 fewer to 7 fewer cases). Using fibrin glue may lead to more complications compared with sutures (RR 1.92; 95% CI 1.22 to 3.02, 11 RCTs, 673 eyes, low-certainty evidence). The most common complications reported were: graft dehiscence, graft retraction and granuloma. On average using fibrin glue may mean that surgery is quicker compared with suturing (mean difference (MD) -17.01 minutes 95% CI -20.56 to -13.46), 9 RCTs, 614 eyes, low-certainty evidence).

## CONCLUSION

In the context of pterygium surgery, the application of fibrin glue for securing the free conjunctival autograft leads to an expedited recovery, reduced pain, and a lower incidence of complications.

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