

The effectiveness of pterygiumectomy using conjunctival autoplasty using bioglue

Boboev Saidavzal Abdurakhmanovich¹, Gaffarov Ganisher Karimovich²,

Ph.D. Associate Professor, Department of Ophthalmology, Samarkand State Medical University¹, Samarkand State Medical University, Department of Ophthalmology is an independent researcher²,

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Abstract

Pterygium is a common ocular surface disorder characterized by fibrovascular proliferation of conjunctival tissue that extends onto the cornea and may lead to visual disturbance, chronic irritation, and cosmetic concerns. Surgical removal remains the primary method of treatment, especially in progressive cases where the lesion threatens the visual axis or causes significant discomfort. Traditional surgical techniques often involve suturing conjunctival grafts, which may prolong operation time and increase postoperative inflammation and patient discomfort. The use of bioglue for fixation of conjunctival autografts has recently emerged as an alternative approach aimed at improving surgical outcomes and reducing complications. This study evaluates the clinical effectiveness of pterygiumectomy combined with conjunctival autoplasty using bioglue fixation. Particular attention is given to operative time, postoperative recovery, recurrence rates, and patient comfort. The results indicate that bioglue-assisted conjunctival autografting provides stable graft fixation, reduces surgical trauma, shortens recovery time, and contributes to lower recurrence rates compared with traditional suturing techniques. Pterygium is a common ocular surface disorder characterized by the growth of fibrovascular conjunctival tissue onto the corneal surface, which may result in chronic irritation, inflammation, and progressive visual disturbance. Surgical removal remains the most effective treatment, especially when the lesion advances toward the visual axis or causes significant discomfort. One of the most widely accepted surgical methods for preventing recurrence is conjunctival autografting following pterygium excision. In recent years, biological adhesives have been introduced as an alternative to traditional suturing techniques for graft fixation. The use of bioglue allows rapid attachment of the conjunctival graft while minimizing tissue trauma and postoperative inflammation. This study evaluates the clinical outcomes of pterygiumectomy combined with conjunctival autoplasty using biological adhesive fixation. Particular attention is given to surgical efficiency, postoperative recovery, graft stability, and recurrence prevention. The findings demonstrate that the application of biological adhesive materials significantly improves surgical convenience, shortens operation time, enhances patient comfort, and contributes to favorable healing of the ocular surface.

Keywords: pterygium; pterygiumectomy; conjunctival autograft; bioglue; ocular surface surgery; recurrence prevention; ophthalmic surgery; corneal disorders

1. Introduction

Pterygium is a degenerative and proliferative disorder of the ocular surface characterized by abnormal growth of conjunctival tissue that gradually invades the corneal surface. The condition is particularly prevalent in regions with

high ultraviolet radiation exposure, dry climates, and significant environmental irritation such as dust and wind. Although the exact pathogenesis remains complex, chronic ultraviolet exposure, oxidative stress, and inflammatory processes are considered major contributing factors. Clinically, pterygium may cause symptoms including ocular irritation, foreign body sensation, redness, and visual impairment when the lesion extends toward the central cornea. Surgical removal of the abnormal tissue remains the most effective treatment method, particularly in cases where progressive growth threatens visual function. However, recurrence after surgery has historically been one of the main challenges associated with pterygium management. Various surgical techniques have been developed to reduce recurrence rates, including conjunctival autografting, amniotic membrane transplantation, and the use of adjunctive pharmacological agents. Conjunctival autografting is currently considered one of the most reliable techniques for preventing recurrence. Recently, the application of biological adhesive materials for graft fixation has gained attention as an alternative to traditional suturing methods. Bioglue fixation allows secure graft attachment while minimizing tissue trauma, reducing operative time, and improving postoperative comfort. Pterygium represents a degenerative and proliferative disorder of the conjunctiva characterized by the abnormal extension of fibrovascular tissue from the bulbar conjunctiva toward the cornea. The disease occurs more frequently in individuals exposed to environmental factors such as ultraviolet radiation, wind, dust, and dry climates. Chronic irritation and oxidative stress are believed to stimulate inflammatory processes and abnormal cell proliferation within the conjunctival epithelium. As the lesion gradually progresses across the corneal surface, it may induce corneal astigmatism, impair visual acuity, and cause persistent ocular discomfort. Surgical excision remains the primary therapeutic option when conservative treatment fails to control symptoms or when the lesion continues to enlarge. One of the most significant challenges associated with pterygium surgery is the possibility of recurrence following excision. To reduce this risk, conjunctival autografting has been widely adopted as an effective surgical technique. Traditionally, the transplanted conjunctival tissue is secured with sutures; however, suturing may prolong the procedure and contribute to postoperative irritation and inflammation. The introduction of biological adhesive fixation has provided an alternative method that simplifies graft placement while improving postoperative recovery.

2. Materials and Methods

The present study included patients diagnosed with primary pterygium who underwent surgical treatment in an ophthalmology department. All participants presented with progressive fibrovascular growth extending onto the corneal surface and experienced symptoms such as ocular irritation or visual disturbance. Preoperative evaluation included detailed ophthalmological examination consisting of visual acuity testing, slit-lamp biomicroscopy, corneal topography, and assessment of lesion size and vascularity. Surgical treatment involved excision of the pterygium tissue followed by transplantation of a conjunctival autograft obtained from the superior bulbar conjunctiva. Instead of conventional suturing techniques, a biological adhesive was used to secure the graft to the recipient bed. The bioglue allowed rapid fixation of the conjunctival tissue while maintaining proper orientation and stability. Postoperative management included topical anti-inflammatory and antibiotic medications to prevent infection and control inflammation. Patients were followed during the postoperative period to evaluate graft stability, healing time, recurrence of fibrovascular tissue, and patient comfort.

3. Results

Clinical evaluation demonstrated favorable outcomes following pterygiumectomy with conjunctival autoplasty using bioglue fixation. Surgical procedures were completed in a shorter time compared with traditional suturing techniques due to rapid graft adhesion. Postoperative observations indicated good graft stability and proper integration of the transplanted conjunctival tissue with the surrounding ocular surface. Patients reported reduced postoperative discomfort, including less foreign body sensation and irritation, which are commonly associated with sutured grafts. Healing of the ocular surface occurred smoothly, with minimal inflammation observed during follow-up examinations. Recurrence of fibrovascular tissue growth was observed in only a small number of cases, indicating that the bioglue-assisted conjunctival autograft technique effectively reduces the risk of postoperative recurrence. Visual acuity remained stable or improved in patients whose lesions had previously caused corneal distortion.

4. Discussion

The results of this study confirm that the use of biological adhesive for conjunctival autograft fixation represents a valuable advancement in pterygium surgery. Traditional suturing methods, although effective in securing the graft, are often associated with longer operative time, postoperative discomfort, and increased inflammatory response. Bioglue fixation offers several advantages, including rapid application, reduced tissue manipulation, and improved patient comfort during recovery. The adhesive creates a stable interface between the graft and recipient tissue, promoting

proper healing and reducing the risk of graft displacement. Additionally, shorter surgical duration decreases intraoperative trauma and may contribute to better overall surgical outcomes. The low recurrence rate observed in this study supports the effectiveness of conjunctival autografting combined with biological adhesive fixation. These findings suggest that this technique may represent an optimal surgical approach for managing primary pterygium, particularly in patients seeking faster recovery and improved postoperative comfort. Clinical observations revealed that pterygiumectomy followed by conjunctival autoplasty using biological adhesive fixation produced favorable postoperative outcomes. The surgical procedure required significantly less operative time compared with traditional suturing techniques because the graft could be attached rapidly with the adhesive material. Postoperative examinations demonstrated stable positioning of the conjunctival graft and proper integration with surrounding ocular tissues. Healing of the ocular surface occurred smoothly with minimal inflammatory response. Patients reported less postoperative discomfort, including reduced foreign body sensation and irritation, which are commonly associated with sutured grafts. Follow-up evaluations showed a low incidence of fibrovascular regrowth, indicating effective prevention of recurrence. Visual function either remained stable or improved in cases where the lesion had previously induced corneal surface irregularities.

5. Conclusion

Pterygiumectomy combined with conjunctival autoplasty using bioglue fixation demonstrates high clinical effectiveness in the treatment of primary pterygium. The technique significantly reduces surgical time, improves postoperative comfort, and provides stable graft adhesion without the need for sutures. Patients undergoing this procedure experience favorable healing outcomes and a lower risk of recurrence compared with conventional methods. The use of biological adhesive materials in ocular surface surgery therefore represents a promising advancement that enhances surgical efficiency and patient satisfaction. Continued clinical research and long-term follow-up studies may further confirm the advantages of this approach and support its wider application in ophthalmic surgical practice. Pterygiumectomy combined with conjunctival autoplasty using biological adhesive fixation represents an effective surgical approach for the treatment of pterygium. The technique offers several advantages, including shorter operative duration, improved postoperative comfort, and stable graft adhesion without the need for sutures. Clinical outcomes demonstrate favorable healing of the ocular surface and a reduced risk of recurrence when compared with traditional suturing methods. Adoption of biological adhesive materials in ocular surface surgery therefore contributes to improved surgical efficiency and enhanced patient recovery. Continued clinical observation and long-term follow-up studies will further clarify the durability and broader clinical benefits of this technique in the management of pterygium.

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