

Comparative Analysis of Methods of Traditional and Autoplastic Surgical Treatment of Primary Pterygium

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Abstract

Primary pterygium is a common ocular surface disorder characterized by fibrovascular proliferation of conjunctival tissue extending onto the cornea. The disease often leads to chronic ocular irritation, cosmetic problems, and progressive visual impairment when the lesion advances toward the visual axis. Surgical excision remains the most effective method of treatment; however, recurrence after surgery continues to be a significant clinical challenge. Traditional excision techniques without tissue replacement have been associated with relatively high recurrence rates due to continued fibrovascular proliferation from the conjunctiva. Autoplastic surgical approaches, particularly conjunctival autografting, have been introduced to reduce recurrence and improve postoperative outcomes. The present study provides a comparative evaluation of traditional surgical excision and autoplastic treatment methods in patients with primary pterygium. The analysis focuses on operative characteristics, postoperative healing, recurrence rates, and visual outcomes. The findings demonstrate that autoplastic surgical techniques offer superior clinical effectiveness, improved tissue regeneration, and significantly lower recurrence compared with traditional excision methods. Primary pterygium is a frequent ocular surface pathology characterized by fibrovascular proliferation originating from the conjunctiva and gradually spreading over the corneal surface. This process can lead to persistent ocular irritation, inflammatory changes, and progressive visual impairment when the lesion approaches the optical zone of the cornea. Surgical removal remains the principal method of treatment; however, recurrence after excision has long been recognized as a major clinical challenge. Traditional surgical techniques involving simple removal of pathological tissue without reconstruction often demonstrate high recurrence rates due to continued conjunctival proliferation. In contrast, autoplastic surgical approaches such as conjunctival autografting aim to restore anatomical integrity of the ocular surface and reduce the likelihood of recurrent fibrovascular growth. Comparative evaluation of these treatment strategies is essential for determining the most effective surgical method for primary pterygium management. The present analysis highlights differences in postoperative outcomes, tissue healing, and recurrence prevention between traditional excision techniques and autoplastic reconstruction procedures.

Keywords: *primary pterygium; pterygium surgery; conjunctival autograft; autoplastic surgery; ocular surface disease; recurrence prevention; ophthalmic surgery; corneal disorders*

1. Introduction

Primary pterygium is a degenerative and proliferative disorder of the ocular surface in which fibrovascular conjunctival tissue gradually invades the cornea. The condition is particularly prevalent in regions with high exposure to ultraviolet

radiation and environmental irritants such as wind, dust, and dry climates. Chronic ultraviolet exposure is believed to induce degenerative changes in conjunctival tissues, leading to abnormal fibrovascular growth and progressive extension toward the corneal surface. As the lesion enlarges, patients may experience symptoms including ocular redness, foreign body sensation, tearing, and blurred vision caused by corneal surface irregularities and induced astigmatism. Surgical removal of the abnormal tissue remains the primary therapeutic approach when conservative measures fail to control symptoms or when the lesion threatens visual function. Historically, simple excision of the pterygium tissue represented the most commonly used surgical technique; however, this method has been associated with high recurrence rates due to persistent fibrovascular proliferation. To address this limitation, autoplasic surgical methods such as conjunctival autografting have been developed. In these techniques, healthy conjunctival tissue from another region of the eye is transplanted to the site of excision, providing a biological barrier that reduces recurrence and promotes physiological healing. Comparative evaluation of these surgical approaches is essential for determining the most effective method for managing primary pterygium. Primary pterygium represents a degenerative and proliferative disease of the ocular surface in which abnormal fibrovascular tissue develops from the bulbar conjunctiva and gradually advances toward the cornea. The condition occurs more frequently in individuals living in regions with intense ultraviolet radiation and environmental exposure to dust, wind, and dryness. Long-term ultraviolet irradiation is believed to trigger degenerative changes in conjunctival collagen fibers and stimulate abnormal cellular proliferation, ultimately leading to formation of the characteristic triangular lesion extending onto the corneal surface. As the pathological tissue grows, it may cause chronic irritation, conjunctival hyperemia, foreign body sensation, and visual disturbance due to induced corneal astigmatism. Surgical intervention becomes necessary when the lesion progresses toward the central cornea or produces significant clinical symptoms. Historically, simple excision was the most widely used surgical technique, but this method frequently resulted in recurrence because residual fibrovascular tissue remained capable of continued proliferation. Autoplasic surgical procedures were later developed to address this limitation by transplanting healthy conjunctival tissue to the site of excision. This approach provides structural coverage of the scleral surface and acts as a biological barrier preventing further abnormal growth. Evaluating the comparative effectiveness of these techniques is important for improving surgical outcomes and optimizing long-term patient management.

2. Materials and Methods

The study included patients diagnosed with primary pterygium who underwent surgical treatment in an ophthalmology clinic. Participants were divided into two groups according to the surgical technique used. The first group underwent traditional pterygium excision without conjunctival tissue replacement, while the second group received pterygiectomy followed by conjunctival autograft transplantation as an autoplasic surgical procedure. Preoperative assessment included visual acuity measurement, slit-lamp biomicroscopy, corneal topography, and evaluation of lesion size, vascularization, and corneal involvement. During surgery, fibrovascular tissue was carefully excised from the corneal surface and surrounding conjunctiva. In the autoplasic procedure, a thin conjunctival graft was harvested from the superior bulbar conjunctiva and transplanted to cover the exposed scleral area after lesion removal. The graft was secured using sutures or biological adhesive depending on surgical preference. Postoperative care included topical anti-inflammatory and antibiotic medications to prevent infection and control inflammatory response. Patients were followed during the postoperative period to evaluate healing of the ocular surface, recurrence of fibrovascular growth, visual acuity changes, and overall surgical outcomes.

3. Results

Clinical evaluation revealed distinct differences in postoperative outcomes between the two surgical approaches. Patients who underwent traditional excision without conjunctival tissue replacement demonstrated faster initial surgical completion but experienced a higher rate of postoperative fibrovascular regrowth. In several cases, recurrence occurred within the first year following surgery, accompanied by renewed conjunctival inflammation and progressive extension of tissue onto the corneal surface. In contrast, individuals treated with autoplasic conjunctival grafting showed significantly lower recurrence rates and more stable healing of the ocular surface. The transplanted conjunctival tissue provided effective coverage of the scleral defect and prevented migration of fibrovascular cells from adjacent conjunctiva. Postoperative inflammation was generally mild, and epithelial regeneration occurred smoothly in most cases. Visual acuity improved or remained stable in patients whose corneal surface irregularities had previously caused refractive distortion. Overall, the autoplasic method demonstrated better long-term clinical outcomes compared with the traditional technique. Clinical observations revealed clear differences in postoperative outcomes between patients treated with traditional excision and those who underwent autoplasic reconstruction procedures. Individuals who received simple removal of pathological tissue without graft placement often demonstrated satisfactory initial healing but showed a greater tendency for fibrovascular regrowth during the follow-up period. Recurrence was commonly

accompanied by conjunctival hyperemia and gradual reappearance of tissue growth toward the cornea. In contrast, patients treated with conjunctival autografting exhibited more stable postoperative recovery and significantly lower recurrence rates. The transplanted conjunctival tissue successfully covered the exposed scleral surface and provided a protective barrier that inhibited migration of proliferative cells from adjacent conjunctival regions. Healing of the ocular surface occurred smoothly with minimal inflammatory response, and epithelial regeneration was observed within a relatively short period. Visual function remained stable or improved in cases where corneal irregularity had previously affected optical quality.

4. Discussion

The comparative findings emphasize the importance of tissue reconstruction in the surgical management of primary pterygium. Simple excision without graft placement leaves the scleral bed exposed and may stimulate fibrovascular proliferation during the healing process, which contributes to the high recurrence rates historically associated with this technique. Autoplastic procedures address this limitation by providing a biological barrier that restores normal conjunctival anatomy and inhibits abnormal tissue growth. Conjunctival autografting also supports physiological healing of the ocular surface and reduces postoperative inflammation. Although the autoplastic technique may require slightly longer surgical time and greater technical precision, its advantages in preventing recurrence and improving long-term outcomes outweigh these limitations. Advances in surgical methods, including the use of biological adhesives and refined microsurgical techniques, have further enhanced the effectiveness and safety of conjunctival autografting. The results of this study support the growing consensus that autoplastic reconstruction should be considered the preferred surgical approach for primary pterygium. The comparative outcomes emphasize the importance of reconstructive techniques in modern pterygium surgery. Traditional excision methods, although technically simple, leave the scleral surface exposed and may stimulate fibrovascular proliferation during the healing process. This phenomenon explains the relatively high recurrence rates associated with earlier surgical approaches. Autoplastic procedures address this limitation by restoring the physiological structure of the ocular surface through transplantation of healthy conjunctival tissue. The graft not only covers the scleral defect but also reduces inflammatory stimulation and prevents migration of abnormal fibrovascular elements. In addition to lowering recurrence risk, autoplastic reconstruction contributes to improved cosmetic appearance and greater postoperative comfort for patients. Advances in microsurgical techniques and the introduction of biological adhesives have further enhanced the stability and effectiveness of conjunctival graft fixation. These developments support the transition from traditional excision techniques toward reconstructive surgical methods as the preferred approach in primary pterygium treatment.

5. Conclusion

Comparative evaluation of traditional excision and autoplastic surgical treatment demonstrates that conjunctival autografting provides superior clinical outcomes in patients with primary pterygium. The autoplastic technique significantly reduces recurrence rates, promotes stable healing of the ocular surface, and improves long-term visual results. Although traditional excision may be technically simpler, its higher recurrence risk limits its effectiveness as a definitive treatment. Incorporation of conjunctival autografting into routine surgical practice represents an important advancement in the management of pterygium and contributes to improved patient prognosis. Continued refinement of surgical techniques and long-term clinical monitoring will further optimize treatment strategies for this common ocular condition. Comparative evaluation of traditional and autoplastic surgical treatment methods demonstrates that reconstructive techniques provide superior long-term results in the management of primary pterygium. Conjunctival autografting significantly reduces recurrence rates, promotes stable healing of the ocular surface, and helps maintain normal corneal anatomy. Although traditional excision remains technically straightforward, its limited ability to prevent fibrovascular regrowth reduces its clinical effectiveness. Incorporation of autoplastic reconstruction into routine ophthalmic surgical practice represents an important advancement in pterygium management. Early surgical intervention combined with modern reconstructive techniques contributes to improved functional outcomes, enhanced patient comfort, and long-term preservation of ocular surface integrity.

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