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Manifestations of ocular irritation after pterygium surgery with sutured conjunctival autograft

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Background: Ocular irritation remains the main disadvantage of the sutured conjunctival graft after pterygium excision. Evaluation of the severity of these manifestations can be helpful for better patient counselling about the expected postoperative course.

Aim: To evaluate the manifestations of ocular irritation in patients treated by pterygium excision with sutured conjunctival autograft.

Setting: A prospective interventional case series that evaluated the postoperative manifestations of ocular irritation in pterygium patients.

Methods: Twenty-five pterygium patients were treated by pterygium excision with vicryl 8/0 sutured conjunctival autograft. The severity of postoperative foreign body sensation, pain, watering, and localised hyperemia involving the nasal conjunctival quadrant were evaluated, scored, and graded.

Results: The main reported symptom was foreign body sensation, with a mean grade of 1.9 ± 0.54 recorded 3 to 4 days postoperatively, which declined one week postoperatively to a mean of 1 ± 0.45. Mild to moderate tolerable symptoms were reported in 92% at the first postoperative visit with an average score of 5 ± 1.05, which declined to an average of 1.4 ± 0.52 at one week, with all the patients reporting minimal symptoms. At the end of the follow-up, the mean index of localised nasal conjunctival hyperaemia was 2.5 ± 0.39. Recurrence was recorded in one patient (4%). No other complications were encountered.

Conclusion: Sutured conjunctival autograft can be used safely with tolerable short-term minimal to moderate manifestations of ocular irritation with no significant complications.

Keywords: Pterygium; conjunctival autograft; ocular irritation; sutured graft; conjunctival hyperemia.

Introduction

A pterygium is a wing-shaped fibrovascular tissue, continuous with the conjunctiva and encroaching on the cornea. It has different reported prevalence rates and is known to be more frequent in hot, dry and smoky environments with more exposure to ultraviolet radiation.[1,2,3,4] Histologically, its characteristic features include neovascularisation, inflammatory cells, altered limbal cells and an epithelial layer showing squamous metaplasia with stromal proliferating fibroblasts.[5]

Management is only surgical. Prevention of recurrence is one of the main concerns in pterygium surgery. Many commonly used adjunctive measures were reported to achieve this goal, including beta-irradiation, mitomycin C, amniotic membrane transplantation and conjunctival autograft.[6,7,8,9,10] Conjunctival autograft is considered the best procedure associated with the lowest recurrence rate.[11] It has been traditionally fixed by sutures, and lately, fibrin glue was used for this purpose. The use of fibrin glue is gaining more popularity in this surgery with the reported reduction of postoperative pain and surgical time.[12] However, sutures are still used for graft fixation in pterygium surgery.

In this study, the manifestations of ocular irritation associated with sutured conjunctival autograft in pterygium patients were evaluated.

Patients and methods

This was a prospective interventional case series designed to evaluate the degree of ocular irritation in patients undergoing surgery for excision of pterygium with sutured conjunctival

autograft. Twenty-five patients who presented with nasal pterygium were included. A complete ophthalmological evaluation was performed, including a detailed history, visual acuity measurement, refractive evaluation and slit-lamp anterior and posterior segment evaluation.

All the patients were treated with excision of pterygium surgery with conjunctival autograft. The procedures were done under local anaesthesia. Proparacaine hydrochloride 0.5% eye drops were instilled (Alcaine®, Alcon®). This was followed by subconjunctival infiltration of lidocaine 2% solution (Xylocaine®) in the area involved by the pterygium. The body of the pterygium was then sharply dissected from the sclera until reaching the limbus, with excision of the thickened underlying Tenon's capsule. The remaining pterygium head was carefully excised off the cornea by blunt dissection, starting from the limbal side. The upper temporal area of the conjunctiva was exposed and marked to fashion an oversized graft 1 mm larger than the nasal defect. Lidocaine solution was injected subconjunctivally in the area of the marked graft, aiming to separate the conjunctiva from the underlying Tenon's capsule. The conjunctiva was then sharply dissected and moved to the nasal defect area, keeping the orientation with the limbal edge directed towards the limbus and the epithelial side directed upwards. The corners of the graft were fixed to the episclera, and then the sides were sutured to the conjunctiva using Vicryl® 8/0 sutures. A bandage contact lens was applied and kept for the first 3 to 4 days postoperatively. Antibiotic and corticosteroid eye drops were used four times daily for one week, and then gradually reduced over three weeks. After removal of the bandage lens, a combined antibiotic and corticosteroid eye ointment was used once daily for two weeks.

The follow-up was scheduled at 3 to 4 days, one week, one month, two months and three months after surgery. The symptoms of ocular irritation, which included pain, foreign body sensation and watering of the eye, were subjectively evaluated. The pain was evaluated with the use of a five-point scale.[13] In this scale, 0 indicated no pain; 1 indicated very mild tolerable pain; 2 indicated mild pain and discomfort; 3 indicated moderate pain which interfered with the patient's usual activities; and 4 indicated severe pain totally interfering with daily activities or sleep. Symptoms of foreign body sensation and watery eyes were evaluated using the abnormal sensation scale of four points,[13] in which 0 indicated no abnormal sensation; 1 referred to abnormal sensation which is somewhat bothersome; 2 indicated sensation which is moderately bothersome; and 3 referred to a very bothersome abnormal sensation. The scores of the symptoms evaluations were collected in one total score ranging from 0 to 10. If the total score was three or less, it was considered a minimal degree of irritation (grade I); a score of four to six was considered a tolerable, mild to moderate degree of irritation (grade II) and a score of seven or more indicated the highest degree of severe, annoying irritation (grade III).

Evaluation of the conjunctival hyperaemia affecting the nasal quadrant was performed one week, one month, two months and three months after surgery. The Cornea and Contact Lens Research Unit (CCLRU) Photographic Grading Scale was used for this purpose.[14] In this scale, 1 indicated very slight hyperaemia; 2 indicated slight hyperaemia; 3 indicated moderate hyperaemia; and 4 indicated severe hyperaemia. To describe the intermediate cases, a decimal fraction of 0.5 was added. The patients were also checked during the follow-up visits for any complications such as wound dehiscence, suture granuloma or pterygium recurrence.

Ethical considerations

The study adhered to the principles of the Declaration of Helsinki, and it was approved by the Ethical Committee at the Faculty of Medicine, Tanta University (ref. no. 34970/10/21). Informed consent was obtained from all the participants.

Results

The study included 25 consecutive patients with nasal pterygium; 80% were males (20 patients). The mean patient's age was 46.04 ± 6.87 years (mean ± standard deviation [s.d.]). and 44% had the pterygium in the right eye (11 patients).

The highest score for postoperative irritation symptoms was recorded for foreign body sensation, with a mean of 1.9 ± 0.54 in first postoperative visit (3 to 4 days after surgery). It declined to an average of 1 ± 0.45 in the second postoperative visit (one week after surgery). The recorded scores of all symptoms (foreign body sensation, pain and watering) are shown in Table 1.

The mean total score of ocular irritation symptoms was 5 ± 1.05 in the first follow-up visit. Mild to moderate, tolerable irritation (grade II) was reported in 92%, and severe, annoying irritation (grade III) was reported in 8%. One week postoperatively, the mean of the total score significantly declined to 1.4 ± 0.52, with all the patients reporting minimal symptoms (grade I). Two weeks postoperatively, all the patients were free of symptoms.

The mean score for localised hyperaemia of the nasal conjunctival quadrant was 3.85 ± 0.23 when evaluated one week after surgery. One month postoperatively, it declined to a mean of 3.2 ± 0.25. At the end of the follow-up, it was further reduced to 2.5 ± 0.39 (Figure 1, Figure 2 and Figure 3).

Recurrence of the pterygium was reported in 4% (1 patient). Suture-related complications such as infection, wound dehiscence or granuloma formation were absent in any patient.

TABLE 1: The patients' subjective evaluation of postoperative symptoms.

Follow-up visit	Foreign body sensation	Pain	Watering of the eye
First visit	1.9 ± 0.54	1.6 ± 0.66	1.5 ± 0.5
Second visit	1 ± 0.45	0	0.4 ± 0.49

Discussion

Recurrence is one of the major concerns after surgical treatment of pterygium. It may be related to many factors such as the patient's age, pterygium type and environmental factors. Limbal stem cell deficiency also has been incriminated in the process of pterygium recurrence.[6,15] Conjunctival reconstruction by autograft transplantation after pterygium excision was described in 1985.[16] With the advantages of this technique, it is now considered the best available method to reduce the risk of recurrence, with a reported recurrence rate as low as 2% – 9%.[16,17,18] The surgical skills and experience required for graft suturing, the relatively long operative time and the limitations related to conjunctival graft diameter, together with postoperative patient discomfort, are the main disadvantages of this technique.[19,20,21]

The use of fibrin glue for graft fixation was described, and it is rapidly becoming more popular with the advantages of a shorter operation time, shorter learning curve and less postoperative irritation and discomfort.[22,23] Wound dehiscence, graft retraction, higher costs compared to sutures and the lack of availability in nonhospital ambulatory surgery centres were the main reported disadvantages of fibrin glue.[23,24,25,26] To reduce the cost of surgery, the use of one pack of fibrin glue for many patients (5–10) scheduled on the same day was suggested.[22,23,27] The transmission of viral infections with the use of fibrin glue was another concern.[28] This risk was studied and found to be very minimal and negligible with exceedingly large safety margins.[29] Other recently described suture-less methods for graft fixation included electro-cautery and autologous blood.[30,31] With all these available suture-less methods, sutures are still used in pterygium surgery as reported by many authors.[25,32,33]

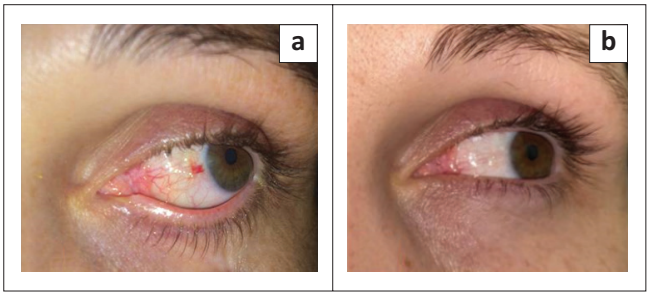

FIGURE 1: Treated pterygium (left eye) showing: (a) 1-month postoperative with mild nasal conjunctival hyperemia and a dot of subconjunctival hemorrhage. (b) At the end of follow-up with normal conjunctival vasculature in the nasal quadrant.

In this study, Vicryl® 8/0 sutures were used to fix the conjunctival autograft in a series of pterygium patients, and the manifestations of postoperative ocular irritation were evaluated. The study did not aim to compare the results of suture fixed graft with other suture-less procedures such as the fibrin glue. Many comparative studies and meta-analyses have already confirmed the advantages of fibrin glue with easier, shorter surgery, more patient comfort and even lower recurrence rates.[28,34,35,36] The main aim was the description of the severity of ocular irritation after the use of suture fixed conjunctival autograft, a technique that is still in use. This can help the surgeons to discuss the expected postoperative course with the patients planning for such a procedure. Foreign body sensation was found as the symptom with the highest patients' grading with a mean of 1.9, a few days after surgery, which declines to a mean of 1 when evaluated 1 week after surgery. Patients' grading was less for pain and watering of the eye. The severity of irritation symptoms was generally less than that reported in the suture groups in the previously published studies.[22,23] This may be related to the use of a bandage contact lens. Its use was reported to facilitate re-epithelialisation with a significant reduction of postoperative pain and discomfort.[25]

The patients' subjective evaluation of different symptoms was collected as a total score with a maximum of 10, to give a

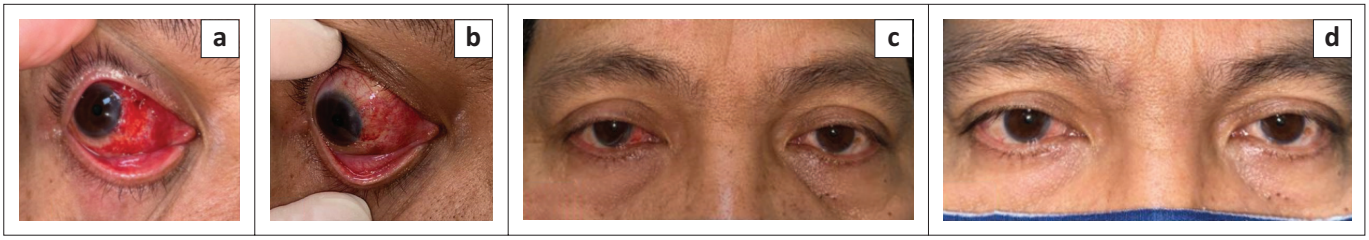

FIGURE 2: Treated pterygium (right eye) showing: (a) one week postoperative with grade 4 conjunctival hyperaemia; (b) and (c) one month postoperative with grade 3 conjunctival hyperaemia; (d) at the end of follow-up with mild (grade 2) nasal conjunctival hyperaemia.

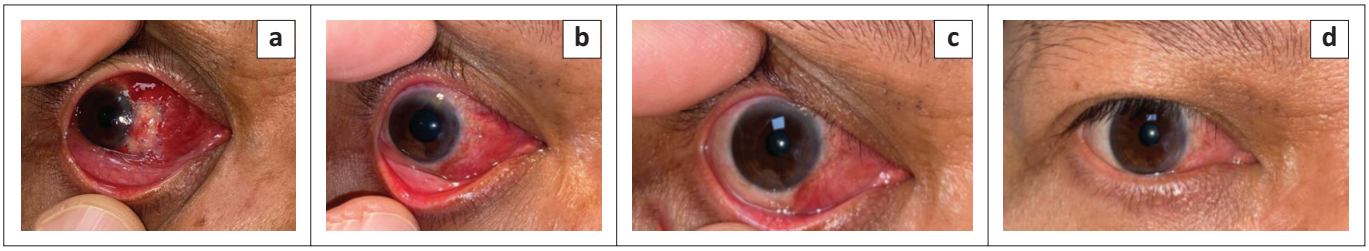

FIGURE 3: Treated pterygium (right eye) showing: (a) one week postoperative with grade 4 conjunctival hyperaemia; (b) one month postoperative with grade 4 conjunctival hyperaemia; (c) and (d) at the end of follow-up with moderate (grade 3) nasal conjunctival hyperaemia.

collective quantitative impression of postoperative irritation symptoms. According to this score, which to the authors' knowledge was not used before, 92% of patients had mild to moderate, tolerable irritation in the first 3 to 4 days (average score: 5). One week postoperatively, all the patients had minimal irritation (average score: 1.4).

The cosmetic deformity is one of the main indications for pterygium surgery.[37] The postoperative localised nasal hyperaemia is expected to be an important patient concern because of its possible cosmetic impact. To the best of the authors' knowledge, the localised hyperaemia in the nasal conjunctival quadrant, as an indicator of ocular irritation in association with pterygium surgery, was not studied before. One week after surgery, an average localised nasal hyperaemia of 3.85 was recorded, which declined to an average of 2.5 at 3 months after surgery. Murphy et al.[38] used the CCLRU grading scale (the same scale used in this study) to evaluate the redness and hyperaemia of normal healthy eyes. They found an average index of bulbar hyperaemia of 1.93, with an upper limit of normal of 2.6. They also reported that the index in the nasal quadrant in normal eyes had an average of 2.3, which was higher than the other three quadrants. They concluded that either the normal eye is actually more red than assumed, or the calibration of the scale is inaccurate. They also commented that the image taken as an example of grade 1 is very white, showing unusual, very low hyperaemia. Accordingly, the localised nasal hyperaemia index reported at the end of follow-up in this study is considered within normal limits.

Conclusion

The use of sutures (Vicryl® 8/0) for the fixation of conjunctival autograft after pterygium excision was associated with a short-term, tolerable, minimal to moderate ocular irritation. No significant complications were reported.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

M.A.E. wrote the main manuscript text. R.R.S. reviewed the manuscript. H.M.S. reviewed the manuscript.

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Data availability

The data sets used and/or analysed during the current study are available from the corresponding author, M.A.E., on reasonable request.

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