

Conjunctival Autograft vs Anchored Conjunctival Rotational Flap (CRA) - A Comparative Study

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Abstract

Original Research Article

Background: To compare conjunctival autograft and anchored conjunctival rotation flap technique, in terms of recurrence and complication rates, after performing a primary pterygium surgery. **Materials & Methods:** Twenty patients who underwent pterygium surgery, which was performed on 1 eye, either using conjunctival autograft or anchored conjunctival rotation flap techniques, were followed up postoperatively for a minimum period of 12 months. The anchored conjunctival rotation flap surgery was conducted by designing a conjunctival flap with a similar shape as that of the autograft; the inferior limbal anchoring point (1 mm) is preserved by the incomplete cutting of the limbal area. After rotation of the flap around the anchoring point, the flap was tightened with sutures to cover the bare scleral area. Early postoperative complications, such as flap or graft edema and granuloma formation, were assessed. Comparative evaluation was done between the two techniques in regard to the various factors mentioned. **Results:** The recurrence rate was similar in the conjunctival autograft group and in the anchored conjunctival rotational flap group. The occurrence of flap or graft edema was lower for anchored conjunctival rotational flap surgery. Neither group had any incidence of granuloma formation. **Conclusions:** The anchored conjunctival rotational flap surgery showed similar pterygium recurrence rates and a lower incidence of flap edema, while enabling simple recognition of flap orientation, compared with the conjunctival autograft technique.

Keywords: Pterygium, Autograft, Anchored flap, Recurrence.

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INTRODUCTION

Pterygium is defined as a degenerative ocular surface disorder with wing-shaped fibrovascular growth of the subconjunctival tissue onto the cornea. The epithelium maybe normal, thick or thin, but it may occasionally show dysplasia. Localised limbal stem cell deficiency is thought as a causative factor for pterygium formation [1].

The exact pathogenesis of pterygium remains uncertain. Studies from diseased tissues have shown UV-induced actinic degeneration [2], subepithelial hyperplasia,³ and basal epithelial mesenchymal metaplasia as possible explanations for disordered local growth. Limbal insufficiency, a concept used for other causes of conjunctival–corneal epithelialization such as chemical burn, has also been implicated in pterygium pathology. Simple pterygium excision is associated with high rates.

Several anatomic and experimental studies have demonstrated the value of the normal limbus in maintaining a normal ocular surface [1]. This has been

supported by numerous reports of restoration of the limbus and in turn the ocular surface by a variety of limbal stem-cell transplants.

Simple pterygium excision is associated with high rates of recurrence, reported to vary between 29.2% and 88.9%[6]. To improve outcome, various adjunctive modalities have been described with the aim to decrease recurrence rates. Conjunctival graft variations would include methods such as sliding conjunctival flap, narrow-strip conjunctival autograft, limbal-conjunctival autograft (LCAU), amniotic membrane graft, and conjunctival rotational autograft (CRA)[14].

In daily practice, however, one of most popular techniques in preventing recurrence is the conjunctival autograft. By covering the bare sclera with self-conjunctival tissue, the recurrence rate is decreased to, 10%. Autografting can be done by taking conjunctival autograft and fixating it with sutures on the area of sclera from where the pterygium has been removed.

Another one is conjunctival rotational autograft (CRA). First described by Spaeth in 1926, the main advantage of CRA (conjunctival rotational autograft) over other forms of conjunctival graft is the preservation of normal conjunctiva in other nonaffected areas. This would be especially advantageous to young patients with higher risks of recurrence and those who may require glaucoma drainage procedures in the future [15].

Aim and objectives

In this study, a flap technique called the “anchored conjunctival rotation flap,” which is a modified conjunctival autograft, is introduced. In this method, orientation of the conjunctival harvest is easy, and the operating time is reduced, because there is 1 less suture (anchored point). The recurrence rate in pterygium excision, were compared using both the techniques in primary pterygium.

MATERIALS AND METHODS

Study was carried out on 20 eyes from Sept 2017 to Aug 2018 (12 months). Following excision of primary pterygium, the conjunctival autografting was employed in 10 cases and conjunctival rotation flap (CRA) was done in 10 cases. Patients were reviewed by members of the corneal subspecialty at day 1, 1 week, 1 month, 3 months, 6 months, 9 months, and 1 year with documentation of best spectacle-corrected visual acuity (BSCVA), epithelial healing, graft status, and possible recurrences. Recurrence was defined as fibro vascular proliferation invading the cornea .1.5 mm [16].

Inclusion criteria

Patients Of ages 30 – 60 yrs
Primary nasal pterygium

Exclusion criteria

Recurrent pterygium, glaucoma, history of previous ocular surgery or trauma, pseudopterygium, HIV/hepatitis B/C

Surgical Procedure

Surgical procedures were carried out under subconjunctival anesthesia with lidocaine HCl 20 mg/ml with epinephrine 0.0125 mg/ml. The pterygium was cut near the limbus by sclero corneal scissors, the head of the pterygium was detached from the surface of the cornea by avulsion and subconjunctival fibrous tissue was completely removed. Any abnormal fibrous tissues were removed with no 15 Bard Parker blades.

For conjunctival flap technique, flap was made from the superior bulbar conjunctiva, near the limbus and margin of the defect. The flap thinly dissected avoiding the Tenon’s capsule, transposed to the deficit area and sutured separately with 9-0 prolene sutures.

In conjunctival autograft technique, the area of superotemporal conjunctiva was marked and a free graft was taken to close the defect. The area was inflated with lidocaine, and dissection was done. Limbus to limbus apposition was done and defect covered. The graft was sutured with 9-0 prolene sutures. After the surgery all the patients were prescribed Prednisolon and Moxifloxacin eye drops 4 times a day for 4 weeks.

Outcome measure

Recurrence of pterygium was defined as being the detection of prominent fibrovascular tissue invading the cornea, on slit-lamp examination, in any follow-up examination. Postoperative conjunctival flap edema and granuloma formation were assessed, using a slit lamp, up to 3 months after the surgery was performed.

Statistical analyses

Statistical analyses were performed using SPSS version 20.0 software (SPSS, Chicago, IL). The chi square test and Student t test were used to compare qualitative and continuous quantitative valuables, respectively. A P value <0.05 is considered significant.

RESULTS

Highest prevalence of pterygium was seen in age group of 45 to 55 years. All the pterygium was nasally located with mean corneal encroachment of 3mmX3.5mm.

Right eye 60% and left eye 40%. All the cases were progressive type. Out of 20 patients 14 (65%) were male, 6 (35%) were female.

During the follow up period of this study progressive pterygium recurred in 2 patients. The average duration of recurrence was 6 months. Mean surgery times in conjunctival rotation flap and conjunctival autograft group was 15 minutes and 25 minutes respectively.

Pigmentation and conjunctival injection was much more prominent in cases of CRA compared to conjunctival autograft. Though it resolved in all cases by the end of 6 months. Also it didn’t cause any major discomfort to the patients.

Table-1

	Conjunctival autograft	Rotational flap
Risk of graft loss	Present	Absent
Healing process	Slow	Faster
Surgical skill	Greater	Lesser
Mean pterygium size	3.2mm	2.6mm

Table-2

	Conjunctival autograft	Rotational flap
Surgical time	25 min	15 min
Recurrence	1	1
Injection	1	3
Sub conj hemorrhage	3	3
Edema	2	2
Pigmentation	1	3

DISCUSSION

To prevent pterygium recurrence, various surgical techniques have been introduced and continuously revised. One of these techniques is the conjunctival autograft; it has shown equal or superior efficacy, in preventing recurrence, to that of intraoperative mitomycin C application [10] (0.02%–0.04%, 2–3 minutes) or amniotic membrane transplantation.

A recent study by Varssano *et al.* [11] reported that the recurrence rate, in pterygium excision combined with conjunctival autograft, was 11.4% (the mean follow-up time of 34.4 months). The conjunctival autograft can significantly reduce postoperative pain and inflammation [12] Inclusion of corneal limbal tissue with the graft, the so-called limbal–conjunctival autograft, results in even lower recurrence rates (0%–3.8%)[13,14]. However, longer operation time, demanding surgical skills, and the potential risk of iatrogenic limbal cell deficiency are major obstacles, and hence, it is not popular for primary pterygia.

In this study, we proposed a modified conjunctival flap procedure called an “anchored conjunctival rotation flap” technique. This procedure has some advantages over the conjunctival autograft technique. The orientation of the conjunctiva and Tenon is easily recognizable, and thus, conjunctival marking is unnecessary in preventing upside-down mistakes. In addition, the anchored point needs no suture; therefore, the operation time can be shortened. Another advantage is the lower incidence of flap edema compared with that for conjunctival autografts. This may be because of the preservation of the vascular network, at the limbus, around the anchored point.

It is noteworthy that the anchored flap technique showed a similar recurrence rate to that of the conjunctival autograft. The flap orientation is the major difference between the anchored conjunctival rotation flap and conjunctival autograft methods. As previously explained, the anchored conjunctival rotation flap changes the flap orientation to a new one (inferior to limbus and superior to fornix). Similar recurrence rates between these 2 different techniques suggest that the flap orientation is not related to recurrence as long as it is not “upside down.” With the limbal–conjunctival autograft, however, flap orientation may be important in ensuring the putative limbal barrier effect.

Finally, on occasion there is a need for a peribulbar anesthesia and traction sutures in conjunctival autografting technique while it is nearly unnecessary in Trans positional flap technique.

Also in trans positional graft technique there is no risk of graft loss and inversion, less time consuming and the vessel structure is preserved so healing process is better we think that this method is safe and is a good alternative for conjunctival autografting, should be kept in mind in almost all pterygium cases except huge ones which needs large size of grafting material.

The limitations of this study include the small sample size, retrospective design, and lack of an appropriate randomization process. Only studying primary pterygia is another limitation, because the conjunctival flap or autograft procedures are conducted more in recurrent cases in clinical practice.

In conclusion, here we propose an anchored conjunctival rotation flap technique after pterygium excision. This technique lowers the recurrence rate of pterygium with a similar effectiveness as in the conjunctival autograft technique, and the procedure is both fast and simple to implement.

CONCLUSION

Taking into consideration the above mentioned comparisons rotational graft is a better technique due to faster surgery and more graft stability.

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