

Comparison of inferior conjunctival autografting and conjunctival tissue grafting from pterygium itself in the cases of filtering blebs and glaucoma suspects-A retrospective analysis

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Purpose: This study aims at comparing the effectiveness of inferior conjunctival autografting (CAG) and conjunctival tissue grafting from pterygium itself (CTG) in the cases of filtering blebs/glaucoma suspects. **Methods:** One hundred and five eyes of 97 patients who underwent pterygium excision with conjunctival autografting (CAG) in the period from 2010 to 2016 were included. Fifty one eyes had filtering blebs and 54 were glaucoma suspects. Fifty two eyes of 49 patients (Group 1) had undergone pterygium excision with inferior conjunctival autograft (CAG) and 53 eyes of 48 patients (Group 2) had undergone pterygium excision with conjunctival tissue graft (CTG) from the pterygium itself. The minimum follow up period was 6 months. **Results:** Both groups had 2 eyes with recurrence, which was not statistically significant. Among other complications, graft retraction was seen with a higher incidence in Group 2, which was statistically significant. **Conclusion:** In situations where sparing of the superior conjunctiva is mandatory, both the techniques of inferior conjunctival autografting and conjunctival tissue graft from the pterygium itself are excellent alternate options with comparable outcomes and no additional risk of significant complications.

Key words: Conjunctival tissue graft, filtering blebs, glaucoma suspects, inferior conjunctival autograft, pterygium

Pterygium is a disorder of the ocular surface characterized by the growth of fibrovascular tissue leading to the destruction of Bowman's membrane. Ultraviolet light exposure has been shown to be one of the most important pre disposing factors for this degenerative condition.^[1] Conjunctival autografting, which is the mainstay in the management of pterygium, has been shown to have a lower recurrence rate when compared to other surgical options.^[2-8] The conjunctival graft is most commonly harvested superiorly. However, superior bulbar conjunctiva may not be available for harvesting a graft in all cases, for example, in the cases of conjunctival scarring due to surgery or trauma. Similarly, grafting from the superior site may also not be possible in the eyes with filtering blebs and it would affect the outcome and functioning of a future filtration surgery.^[9] Thus, options that can be used in such cases include inferior bulbar conjunctival grafting, conjunctival tissue graft from the overlying pterygium itself, amniotic membrane grafting, and bare sclera technique. This study aims at comparing the efficacy of the first two methods, as there have been no previous comparative studies on the same.

Methods

105 eyes of 97 patients who underwent pterygium excision with conjunctival autografting (CAG) in the period from 2010 to 2016

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Received: 22-Nov-2019
Accepted: 04-Apr-2020

Revision: 21-Mar-2020
Published: 23-Sep-2020

Access this article online

Website:
www.ijo.in

DOI:
10.4103/ijo.IJO_2164_19

Quick Response Code:



were retrospectively analyzed. The study was approved by the Ethics committee and adhered to the tenets of Declaration of Helsinki. Among the 105 eyes, 51 eyes had filtering blebs and 54 were glaucoma suspects. 52 eyes of 49 patients (Group 1) had undergone pterygium excision with conjunctival autograft (CAG) from the inferior conjunctiva and 53 eyes of 48 patients (Group 2) had undergone pterygium excision with conjunctival tissue graft (CTG) from the pterygium itself. The choice of procedure was based on the grade of the pterygium. Eyes with Grade 2 pterygia underwent conjunctival tissue grafts and those with Grade 3 and 4 underwent inferior conjunctival graft in the view of larger defects and the need for larger grafts. Pre operative evaluation was done in the form of history, visual acuity, slit lamp examination, grading of pterygium, and fundus examination.

Surgical procedure

Patients in both the groups underwent the procedure under 0.5% proparacaine HCl (Aurocaine, Aurolab, Tamil Nadu, India) topical anesthesia and subconjunctival injection of 2% xylocaine (AstraZeneca, UK). In the eyes belonging to Group 1, the avulsion of the pterygium head was done first and followed by the excision of fibrovascular tissue. Hemostasis was achieved

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Cite this article as: Kodavoor SK, Soundarya B, Dandapani R. Comparison of inferior conjunctival autografting and conjunctival tissue grafting from pterygium itself in the cases of filtering blebs and glaucoma suspects-A retrospective analysis. Indian J Ophthalmol 2020;68:2084-7.

using gentle wet field cautery. Adequate sized conjunctival graft was harvested from the inferior bulbar conjunctiva by dissecting the conjunctiva from the Tenon’s capsule [Fig. 1]. The grafts were secured using fibrin glue, Tisseel (Baxter AG, Vienna, Austria).

In the Group 2 eyes, the surgical procedure was carried out akin to a technique described by Jap *et al.* and a previous study conducted by us.^[10,11] Subconjunctival injection of 2% xylocaine into the pterygium tissue was done. The overlying conjunctiva was meticulously dissected and separated from the pterygium tissue, which was then excised and placed on the corneal surface. Adequate hemostasis was achieved using cautery. The thin conjunctival layer dissected was then placed without rotation on the bare sclera with epithelial side up [Fig. 2]. The graft was then secured using fibrin glue, Tisseel (Baxter AG, Vienna, Austria) as in Group 1.

Patients were started post operatively on topical antibiotics (0.5% moxifloxacin) 4 times a day for 2 weeks, topical steroids (0.5% loteprednol) for 4 weeks, and preservative free tear substitutes (0.5% carboxy methyl cellulose) for 6 weeks. Post operative evaluation, which included clinical examination and refraction, was done on multiple follow ups, which included visits on post operative day 1, 2 weeks, 6 weeks, and 6 months,

Statistical analysis was done using the *t*-test. Statistical significance was defined as $P < 0.05$.

Results

The demographic data is elaborated in Table 1. The mean age of the patients in Group 1 and Group 2 was 46.6 ± 8.9 years and 46.8 ± 9.9 years and male:female ratio was 19:33 and 26:27 respectively. The number of eyes with filtering blebs in the Group 1 and Group 2 were 28 and 23 and number of glaucoma suspect eyes were 24 and 30 respectively. Mean follow up of the patients in Group 1 and Group 2 was 18.1 ± 6.9 and 16.6 ± 8.1 months, respectively.

Recurrence was the primary complication compared between the two groups. It was seen in 2 eyes in each group, which was not statistically significant. Other complications are listed in Table 2 and Fig. 3. Graft retraction in Group 2 was statistically significant when compared with group 1. This can be explained by the fact that obtaining a larger sized graft from the pterygium or oversizing the graft becomes difficult in this conjunctival tissue grafting technique, thus resulting in a graft that is just adequate to cover the bare sclera, which can lead to graft retraction.

Discussion

Harvesting grafts from the inferior conjunctiva or from the pterygium tissue itself aims to preserve the superior conjunctiva in the cases of planned or already performed glaucoma filtration surgeries.

The Group 1 patients in our study underwent inferior conjunctival autografting and the recurrence rate was found to be 3.84%, with the occurrence of donor site fibrosis in 11.53% of the cases. The recurrence rate following inferior conjunctival autografting has not been found to be different from superior conjunctival grafts, thus this procedure does not require any additional adjunctive agents like mitomycin

C. Irritation on blinking is also seen less frequently in inferior grafts when compared to graft taken superiorly.^[12] However, the drawbacks of this method include technical challenges in obtaining a large thin graft and risk of symblepharon formation.^[12]

PP Syam *et al.*^[13] did a retrospective analysis of 30 eyes that underwent pterygium excision with inferior CAG and found the technique to be effective especially in eyes, which are not suitable for the harvesting of superior conjunctiva as a donor. They reported a recurrence rate of 3.3% and the most common complication seen in their study was conjunctival scarring at the donor site, which was seen in 36.6% of the cases, whereas another study conducted by Shrestha A *et al.*^[11] which included 50 eyes undergoing the same technique with a 6 months follow up, reported a recurrence in 4% of the eyes and conjunctival scarring in 8% of the eyes. Both studies reported no symblepharon formation and the results were comparable to our present study.

In a study conducted by Kim *et al.*^[12] inferior conjunctival transpositional flap was done in 54 eyes of 50 patients with primary pterygium and a recurrence of 5.6% was reported. However, this technique may be associated with partial wound disruption, difficulty in obtaining complete donor site coverage, and flap encroachment on to limbus.

It has been shown that there is no significant difference in the rate of recurrence between autografting from superior and inferior conjunctiva in eyes with primary pterygium, however, there can be a significantly higher likelihood of recurrence in the cases of recurrent pterygia in eyes that undergo autografting from the inferior site.^[14] Wong *et al.* reported a higher incidence of recurrence (18.2%)^[15] while using inferior limbal-conjunctival autograft in 11 cases of recurrent pterygia with a follow up 10 to 19 months. They also reported a non progressive

Table 1: Demographic data

Parameters	Group 1 (Inferior CAG)	Group 2 (CTG)
Total number of eyes	52	53
Mean age (years)	46.6±8.9	46.8±9.9
Male:Female	19:33	26:27
No. of eyes with filtering blebs	28	23
No. of glaucoma suspect eyes	24	30
Mean follow up (months)	18.1±6.9	16.6±8.1

Table 2: Comparison of complications among the two groups

Complication	Number (%) Group 1 (Inferior CAG)	Number (%) Group 2 (CTG)	P
Recurrence	2 (3.84)	2 (3.77)	0.49
Graft edema	26 (50.00)	22 (41.50)	0.19
Retraction	4 (7.69)	10 (18.86)	0.04
SCH	11 (21.15)	6 (11.32)	0.08
Graft loss	1 (1.92)	1 (1.88)	0.49
Granuloma	1 (1.92)	0	0.15
Donor site fibrosis	6 (11.53)	-	

SCH: Sub Conjunctival Hemorrhage

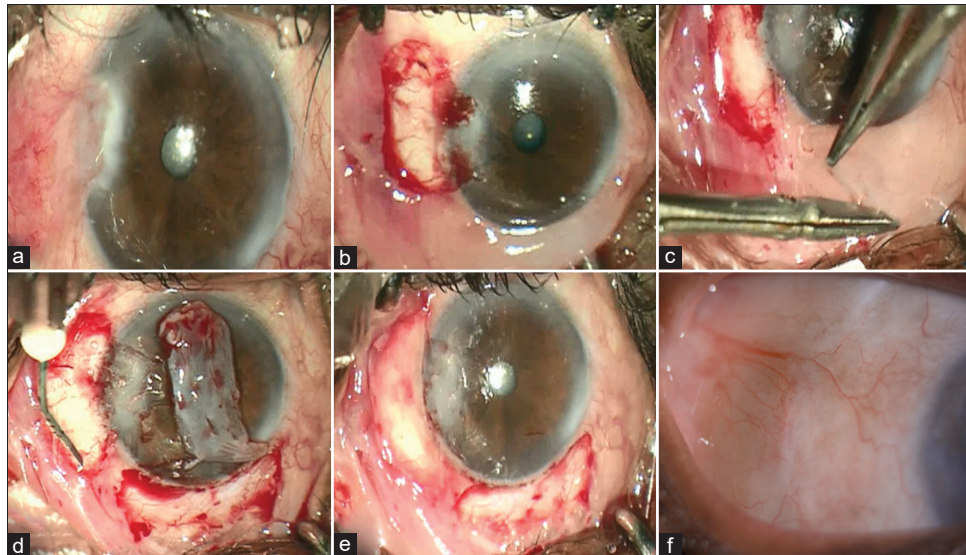


Figure 1: Inferior CAG; (a) Pre operative on-table image; (b) Dissection of pterygium tissue; (c) Harvesting graft from inferior conjunctiva; (d) Application of tissue glue over bed; (e) Secured graft; (f) Post operative follow-up at 6 months

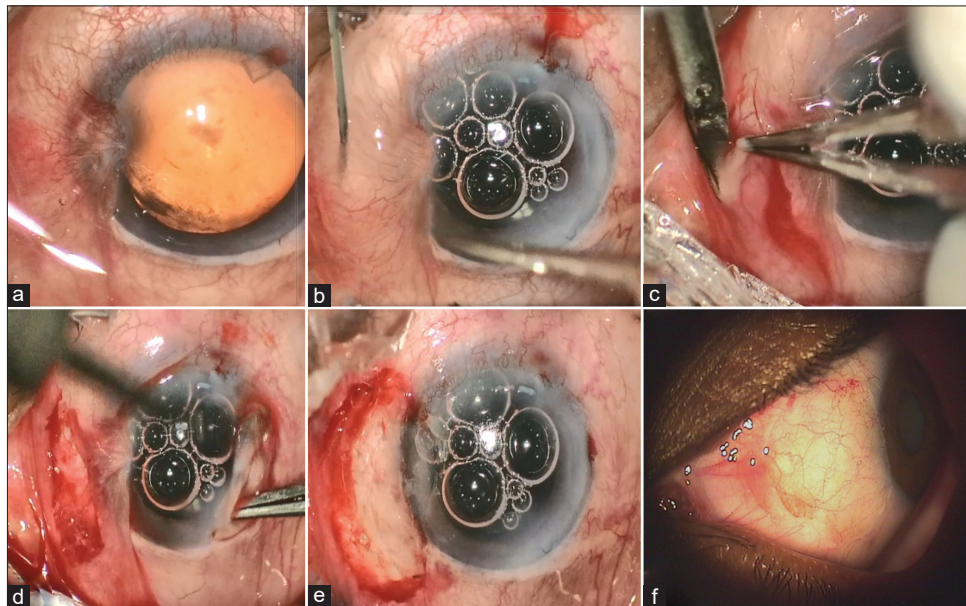


Figure 2: Conjunctival tissue graft; (a) Pre operative on-table image; (b) Injection of subconjunctival 2% xylocaine (c) Dissection of conjunctiva from pterygium tissue; (d) Dissected thin conjunctival graft; (e) Graft secured without rotation using tissue glue; (f) Post operative follow-up at 6 months



Figure 3: Complications; (a) Graft retraction; (b) Graft edema; (c) Subconjunctival hemorrhage

pseudopterygium formation at the donor site in 45.5% of the eyes. A comparative study between superior and inferior CAG in 36 eyes with primary pterygia conducted by Ashraf Bor'i *et al.* compared the clinical and histopathological results. The authors reported 1 recurrence in each group and found no difference in stem cell density between the 2 groups.^[16] An alternative choice in such patients where superior conjunctiva needs to be spared, is amniotic membrane transplantation. Recurrence rates with amniotic membrane grafting were found to be as low as 3.8% to 5.6%.^[17,18]

In the Group 2 eyes of our study, we harvested a thin layer of conjunctival graft from the surface of pterygium tissue and positioned it on the bare sclera without any rotation. Jap *et al.*^[10] conducted a study with conjunctival tissue graft, but with 180° rotation of the conjunctiva and reported a recurrence rate of 4%. The graft rotation was done to shift the epithelium at the limbal end away from it, to prevent recurrence, for which there is no solid scientific evidence. A previous study conducted by us on 98 eyes with primary pterygia, where conjunctival tissue from the pterygium tissue itself, without rotation, was used in eyes with glaucoma filtering bleb/glaucoma suspects, and in the cases of double-head pterygia. A similar method had been used as described in our methodology and a recurrence rate of 4.08% was seen, which is comparable to our present study.^[11]

It has to be noted that the harvested conjunctival tissue tends to be more fragile and the risk of tears are more common even with minimal manipulation. Also, the inclusion of subepithelial tissue in the graft could potentially lead to graft retraction. Thus, a meticulous dissection of the underlying pterygium tissue becomes necessary.^[19] Another cause for graft retraction in this technique results from the difficulty in obtaining a larger sized graft from the pterygium, thus leading to a graft, which is just adequate to cover the bare sclera. Histopathologically, it has been seen that a section of the normal conjunctiva had 2-4 cell layered epithelium with no dysplasia or malignancy, whereas, the conjunctiva overlying the pterygium was found to be uniformly thick with 8-12 layers of epithelial cells, few goblet cells and capillary networks, but with a similar absence of granuloma or dysplasia, thus making it a good source for grafting in selected cases.^[11]

Conclusion

Thus, it can be seen that in situations where sparing of the superior conjunctiva is mandatory, both the techniques of inferior conjunctival autografting as well as conjunctival tissue graft from the pterygium itself are excellent alternate options with comparable outcomes and no additional risk of significant complications.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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