

Efficacy of second donor conjunctival graft from the same site for pterygium - A retrospective analysis

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Purpose: To know the efficacy of the second donor conjunctival graft from the same site as that of the previous donor area in pterygium treatment. **Methods:** Case record of patients were retrospectively analysed and those patients who had undergone pterygium excision previously, either for nasal or temporal pterygium excision and came with complaints of pterygium growth in opposite side of the bulbar conjunctiva in the same eye were included in the study. The patients with double head pterygium previously treated only over one side were also included. Total of 23 such patients were included in the study. The patients were followed up on post-operative day 1, 2 weeks, 6 weeks, 6 months and 1 year. The outcome measures like recurrence, graft edema, graft retraction, graft loss and other complications were noted in each follow up. **Results:** Among the 23 patients included in the study 9 were male and 14 were female patients with a mean age of 44±7.2 years (range 24-57 years). On an average follow up period of 15±8.5 months, only 1 patient among 23 patients had recurrence (4.43%). Other complications noted were graft retraction in 4 eyes (17.4%), sub conjunctival hemorrhage in 8 eyes (34.8%) and graft edema in 11 eyes (47.8%). Only one patient presented with granuloma (4.34%). **Conclusion:** The second conjunctival graft from the same site is safe and effective with encouraging results in indicated cases.

Key words: Conjunctival graft, efficacy, pterygium, recurrence

Pterygium is a common benign ocular surface disorder, where a fibrovascular wing of tissue extends onto the cornea. Environmental factors like exposure to sunlight, mainly to ultraviolet radiation is thought to be an important cause for pterygium.^[1-4] Other etiological factors remain uncertain. Many studies have been carried out to know the prevalence of pterygium, which shows to be ranging from 0.07% to 53%.^[5] Nasal bulbar conjunctiva being the most common site for the pterygium growth,^[6] temporal and double-headed pterygium is also not uncommon.^[7] Conjunctival autograft being the most common and safe, present-day treatment for pterygium.^[8,9]

It is not uncommon nowadays where we treat the same patient's eye for second pterygium excision later. In this article, we report the efficacy of the second conjunctival graft taken from the same site as that used previously to harvest the conjunctival graft.

Methods

Case records of patients who reported to our hospital between April 2013 to April 2018 were retrospectively analyzed. Those patients who had undergone pterygium excision previously, either for nasal or temporal pterygium and came with complaints of pterygium growth on the opposite side of the bulbar conjunctiva in the same eye were included in

the study. Patients who were operated by the same surgeon previously were only considered. The patients with double head pterygium previously treated only over one side were also included.

The data of all the patients such as age, sex, ocular, medical and surgical history, visual acuity before and after surgery, surgical technique, and complications were collected. On slit-lamp examination conjunctival scarring near the perilimbal areas in most of the cases was noted with minimal subconjunctival fibrosis at the donor site. No significant complications which could affect the overall outcome of the procedure were noted in previous surgery in any of the cases. Based on the involvement of pterygium over the cornea it was graded (Grade 1: crossing limbus; Grade 2: midway between limbus and pupil; Grade 3: reaching up to pupillary margin, and Grade 4: crossing pupillary margin). Only up to Grade 3 primary pterygium were included, Grade 4 and recurrent pterygium were excluded from the study.

A total of 23 such patients were included in the study. Among them 9 patients were male and 14 were female patients with age ranging between 24 and 57 years. Out of 23 patients 11 patients presented with nasal pterygium (previously treated for temporal pterygium) and

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12 patients presented with temporal pterygium (previously treated for nasal pterygium). The time interval between the first and second surgery ranged between 25 months to 59 months, with an average of 43 months. All surgeries (both first and second pterygium excision) were performed by a single surgeon at a tertiary eye care hospital in South India. The study protocol adhered to the tenets of the Declaration of Helsinki. The study was approved by the institutional ethics committee and all participants signed written informed consent.

Surgical method

The surgery was done under topical anesthesia and local infiltration. The head of the pterygium was avulsed first, followed by excision of the fibrovascular tissue. Hemostasis was maintained by using gentle wet field cautery. The residual tissue if any over the cornea, was gently scraped and the area was smoothed with the crescent blade. The adequate-sized graft was harvested from the superior conjunctiva (same donor site as that of the previous) after injecting lignocaine 1% solution subconjunctivally with 26-G needle, which was useful for the better dissection of conjunctiva from tenon's capsule. The donor conjunctiva was sized based on the recipient bare sclera, it was oversized by about 0.5 mm in all quadrants after measuring the recipient area. Some resistance to the free flow of subconjunctival lignocaine was noticed in all patients due to minimal subconjunctival fibrosis. A small incision was made first at the forniceal end using Vannas scissors. A careful dissection of the conjunctiva from the tenon's was made to get a thin conjunctival graft and the limbal tissue was not included in any of the grafts. During the dissection areas of adhesions and scar were also noted due to previous surgery and those areas were separated cautiously to maintain the integrity of the graft. After separating the graft from its base, the graft was placed carefully over the bare scleral defect without changing the orientation of the graft [Fig. 1] The graft was secured over the bare sclera using fibrin glue, Tisseel (Baxter, Vienna, Austria). The donor site was left as such after the excision without any primary closure with the adjacent superior conjunctiva. No bandage contact lens was used postoperatively. The donor area got covered with epithelium by secondary healing.

Previous pterygium excision was done following the same surgical procedure as mentioned above using glue. After the graft excision, the donor area was left with intact tenon's and was not covered with surrounding conjunctiva. As the same surgeon had done the first surgery, the surgeon was able to go ahead with the second graft confidently. No

adjuvant agents like mitomycin- c (mmc) was used in any of the surgeries.

All the patients were started 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% Carboxymethyl cellulose) for 6 weeks. The patients were followed up on postoperative day 1, 2 weeks, 6 weeks, 6 months, and 1 year [Fig. 2]. Patients with less than 6 months of follow-up were not included in the study. The outcome measures like recurrence, graft edema, graft retraction, graft loss, and other complications were noted in each follow-up. Recurrence being the main outcome measure was defined as fibrovascular tissue growth of 1.5 mm or more beyond the limbus onto the clear cornea with conjunctival dragging as described by Singh *et al.*^[10]

Results

No intraoperative complications occurred in any of the patients. On an average follow-up of 15 ± 8.5 months, only 1 patient among 23 patients had a recurrence (4.43%). This patient had a graft loss following sloughing [Fig. 3], which was later followed by a recurrence after 6 months. Other complications noted were graft retraction [Fig. 4a] in 4 eyes (17.4%), subconjunctival hemorrhage in 8 eyes (34.8%), and graft edema in 11 eyes (47.8%). The graft edema was noted after 2 weeks of surgery, which got resolved in all cases without any further intervention. Only one patient presented with granuloma at the donor site (4.34%) [Fig. 4b]. The patient responded well after the surgical excision of the granuloma. Table 1 shows lists of complications and their respective percentage.

Discussion

Pterygium excision with conjunctival autograft is the most common and the standard procedure followed now for the

Table 1: Postoperative complications in our study

Postoperative complications	Among 23 patients (%)
Recurrence	1 (4.43%)
Graft edema	11 (47.8%)
Subconjunctival hemorrhage	8 (34.8%)
Graft retraction	4 (17.4%)
Granuloma	1 (4.34%)
Graft loss	1 (4.34%)

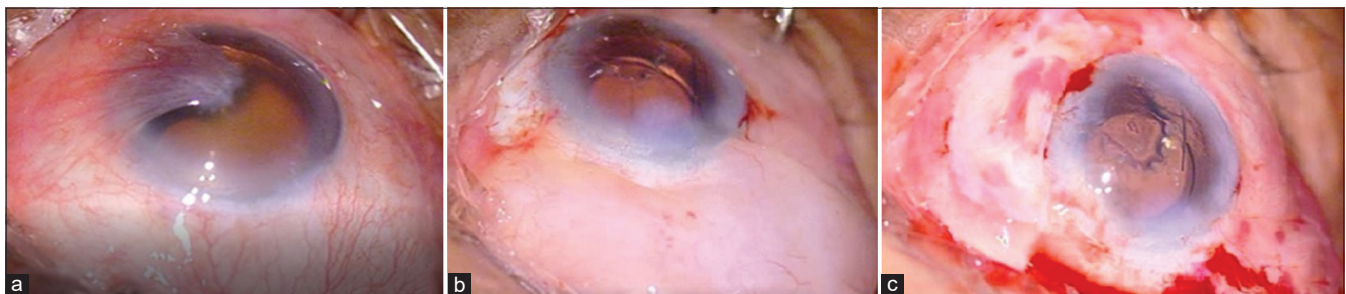


Figure 1: (a) Nasal pterygium, status post temporal pterygium excision with conjunctival autograft, (b) superior bulbar conjunctiva injected with saline for graft dissection – can see few areas of adhesion (tenon's scarring), (c) graft placed *in situ* over the bare sclera

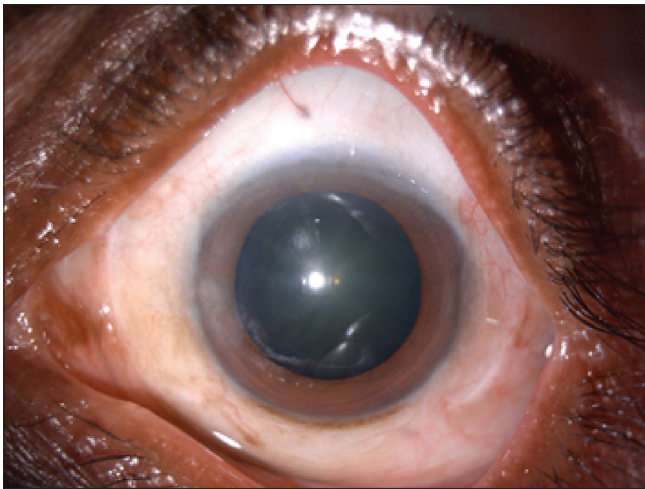


Figure 2: s/p nasal pterygium excision 6 years back and temporal pterygium excision 6 weeks back

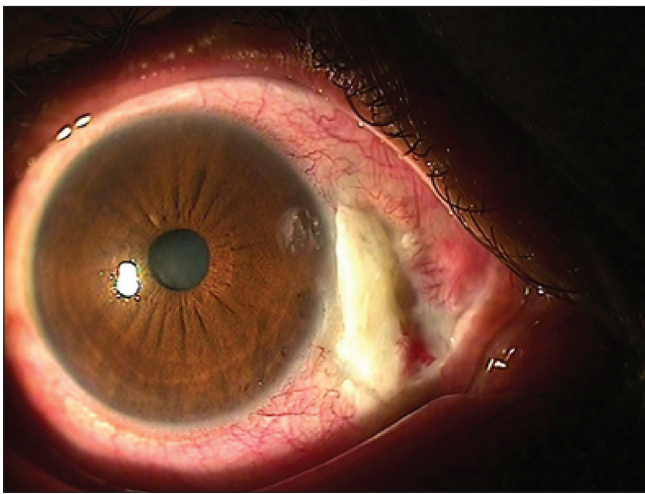


Figure 3: Graft sloughing

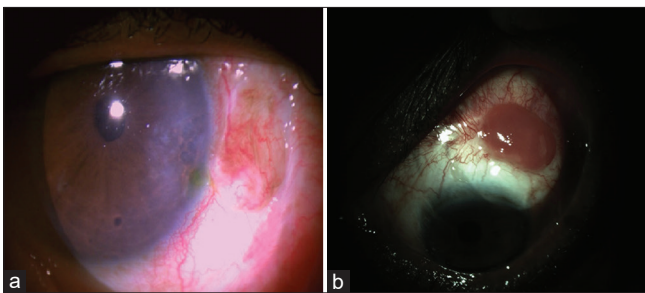


Figure 4: (a). Graft retraction. (b). Granuloma

treatment of pterygium. It also has a very low recurrence rate.^[11] In our study, we included patients who were already treated for pterygium (either for nasal or temporal pterygium) with conjunctival autograft from the superior conjunctiva and had come for pterygium excision on the other side of bulbar conjunctiva in the same eye. Our main aim was to know the efficacy and recurrence following the second conjunctival graft taken from the same site for transplantation.

Various alternative methods that are available for the treatment of pterygium when sufficient conjunctival graft is not available or may not be retrievable due to various reasons. The bare sclera technique has high recurrence rates ranging from 24% to 82%.^[12,13] The bare sclera technique may be combined with intraoperative application of MMC 0.02%, the recurrence rates reported with intraoperative MMC application ranged from 2% to 43%,^[14,15] but the above methods are restricted now due to its increase side effects like scleral or corneal melt, corneal perforation, iritis, and glaucoma.

An alternative way of covering the exposed sclera is by using the human amniotic membrane. Many studies have shown that amniotic membrane transplantation (AMT) is less effective in preventing recurrence.^[16,17] But in cases with large pterygium, scarred conjunctiva, or patients with glaucoma who may need filtration surgery in the future, AMT can be advantageous. In patients presenting with double head pterygium, where both sides are operable in the same setting, then vertical split conjunctival autograft can be followed to cover the bare sclera on both sides.^[18-20]

Sonia N. Yeung *et al.*^[21] did a sequential pterygium excision with conjunctival autograft for the primary double-headed pterygia. The recurrence rate in their study was 5.56% and has concluded that harvesting the conjunctival autograft from the same site several months later doesn't appear to increase the rate of recurrence and is safe and effective. There are also other studies where they have operated for recurrent pterygium and have harvested graft from the previous site. Lawrence Hirst *et al.*^[22] in their study for patients with double-headed pterygium did P.E.R.F.E.C.T (pterygium extended removal followed by extended conjunctival transplant) to remove both nasal and temporal pterygia. The largest pterygium was removed first followed by the next remaining pterygium. In this procedure, about 10 mm to 15 mm of pterygium is excised followed by extensive removal of the tenon's layer, almost from superior to inferior rectus muscle and medial rectus muscle back to the caruncle. A large conjunctival autograft is dissected up to the superior fornix and then placed. The recurrence rate observed with this technique is claimed to be less than 0.1%. A minimal interval of at least 6 months was observed between the surgeries to reduce the inflammation in the superior bulbar conjunctiva. All the graft for the second surgery was always retrieved from the same donor site superiorly without taking the limbal tissue in all patients. The superior bulbar conjunctiva from which the 2 grafts were retrieved showed no scarring in 19 of the eyes, whereas 1 eye showed a central scar. They reported no recurrence in any patients. In our study, the minimum interval from the first surgery was 25 months and the superior conjunctiva was completely healed.

Lawrence W. Hirst^[23] has also done another study for recurrent pterygium and treated them using Pterygium Extended Removal Followed by Extended Conjunctival Transplant. In this study, 111 patients with recurrent pterygium were included and the graft was harvested from the superior bulbar conjunctiva. He has stated that retrieval of the graft from the same site is not very difficult, the scarring because of the previous surgery does not usually extend more than 2 to 3 mm back from the limbus. No recurrence was noted in any of the patients with this technique.

In our study also, recurrence was present in only one patient (4.34%) due to sloughing and loss of the tissue [Fig. 3]. Adhesions and scarring over the donor conjunctiva were noted during the retrieval of the graft, due to previous surgery. The conjunctival graft was meticulously dissected as to not disturb the underlying tenon's and to obtain as thin a graft as possible, minimizing the cuts and bleeding over the donor area. As it was the same surgeon who had performed the first surgery it was an added advantage in all cases. In doubtful cases with thick graft use of sutures with glue could have been done to reduce the graft retraction and graft loss. Granuloma was noted in one patient over the donor site [Fig. 4b]. The main limitation of our study is that it is a retrospective study with only a small sample size. Larger sample size and prospective study would have been a better indicator of the efficacy of the second conjunctival donor graft.

Our study signifies the importance of careful dissection of the donor conjunctiva during the pterygium surgeries, as the patient may present with a second pterygium over the other side of the bulbar conjunctiva or with a recurrence. In any of these cases, a second donor conjunctival graft can be retrieved from the same site. We could not find any difference in the efficacy between the second and first donor conjunctival graft. Reharvesting of the graft from the same site eliminates the dissection of conjunctiva in other areas and also the use of other procedures for coverage of the bare sclera is not required. There are not many studies which is been done to know the efficacy of the second donor conjunctival graft from the same site in South Indian eyes.

Conclusion

Meticulous dissection of the conjunctival graft without disturbing tenons is important during donor graft preparation. Reharvesting of the conjunctival graft from the same site is as effective as that of primary conjunctival graft if the integrity of the donor surface and graft is maintained.

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Conflicts of interest

There are no conflicts of interest.

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