

## Pterygium Excision with Sutureless, Glueless Conjunctival Autograft (SLGL-CAG): Experience of a Tertiary Care Hospital

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### Abstract

**Aim:** To evaluate and analyze the surgical outcome of sutureless, glueless conjunctival autograft (SLGL-CAG) after pterygium excision. Prospective, interventional, hospital-based study. **Methods:** seventy eyes of seventy patients with primary pterygium were graded, and excision was performed by the single surgeon. To prevent recurrence, free CAG was taken from superotemporal or superior quadrant from the same eye and bare sclera was covered without the use of sutures or fibrin glue, allowing natural autologous coagulum of the recipient bed to act as a bioadhesive. The eye was patched for 24 h. postoperatively; patients were put on topical eye drops (gatifloxacin 0.3%, loteprednol etabonate 0.5%, and carboxymethyl cellulose 1%) for 4 weeks. The outcomes were assessed in terms of any recurrence, complication(s), and operative time at each follow-up visit on day 1, 7, 30, and 60. **Results:** There were 52 females (74.2%) and 18 males (25.7%) with mean age (38.83±9.2 years and 38.88±6.5 years, respectively, range 20–60 years). Cosmetic blemish was the chief indication of surgery (51 eyes, 72.8%). Graft-related complication took place in four eye (5.71%; graft dehiscence). Resurgery was required in the latter (5.71%). Granuloma was noted in 2 patients (2.85%). An average surgical time was 20±2 min. **Conclusion:** The recurrence, complication rate, and the operative time of SLGL-CAG seem to be comparable with the current techniques in practice, without adding possible potential hazard of the surgical adjunct.

**Keywords:** Pterygium; Recurrence; Suture-Less Glue-Less Conjunctival Autograft.

### Introduction

Pterygium is a degenerative ocular surface disorder with wing-shaped fibro-vascular growth of the subconjunctival tissue onto the cornea. It is a common ocular surface disease, but also potentially blinding, so different surgical procedures have been used to prevent it. Recurrence after excision remains a great challenge. The pathogenesis of pterygium is still not completely understood. An overall view of the growth process reveals a multiplicity of factors that are correlated and interrelated. Recent evidence implicates anti-apoptotic mechanisms, immunological mechanisms, cytokines, growth factors, extracellular matrix modulators, genetic factors and viral infections, among other possible

causative factors [1,2]. In addition; there are associations with rural regions, increasing age and male gender, which correlate with outdoor work [3]. Early pterygium is usually asymptomatic. Pterygium causes dryness, burning and itching due to irregular wetting of the cornea. Pterygium causes defective vision due to induced astigmatism or direct encroachment onto the visual axis.

Conventional surgical procedures practiced nowadays to prevent recurrence, alone or in combination, are conjunctival flap, conjunctival rotational autograft, amniotic membrane graft (AMG), or free conjunctival autograft (CAG) or limbal CAG (LCAG) with surgical adjunct (e.g., suture, commercial fibrin glue, intra - or post-operative 0.02% mitomycin C [MMC]), with variable postoperative recurrence and/or success rate(s) [4].

CAG surgery with the use of fibrin glue, sutures, or MMC was generally regarded as the procedure of choice where surgery is indicated for the treatment of primary and recurrent pterygium, primarily because of its comparable recurrence rate, efficacy, and long-term safety in contrast to other procedures [5,6].

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**Received on 10.10.2018, Accepted on 24.10.2018**

However, using these surgical adjunct has surgical risks and complications too [4,5,7].

The purpose of our study was to evaluate and analyze the outcome of suture-less, glue-less CAG (SLGL-CAG) following pterygium excision utilizing patient's own natural serum bed for graft adherence without using surgical adjunct (such as suture, fibrin glue), in terms of its postoperative recurrence, complication (s), including operative time

### Materials and Methods

This prospective study comprised seventy eyes of seventy patients undergoing pterygium surgery at department of ophthalmology, Narayana medical college and hospital. Subjects included in the study were from 20 to 65 years of age having primary pterygium involving any eye. Eyes with any pathology which would hamper wound healing such as active infection or inflammation, symblepharon, past ocular surgery within last 6 months, trauma, and systemic diseases such as diabetes mellitus, collagen vascular disease, pregnancy, and bleeding disorders were excluded. Written informed consent was taken from each patient. Preoperative ocular examination included refraction and assessment of best-corrected visual acuity, slit lamp biomicroscopy, baseline intraocular pressure (IOP)-measurement by Goldmann applanation tonometer, fundus examination, and photographic documentation of the pterygium. Wherever patient was found to be taking oral nonsteroidal anti-inflammatory drug (NSAID) and/or anticoagulant, they were discontinued 1 week before surgery. Grading of the pterygium was done as Grade I-ptyerygium head up to the limbus, Grade II-head between the limbus and a point midway between limbus and pupillary margin, Grade III-head between a point midway between limbus and pupillary margin and pupillary margin, and Grade IV-crossing pupillary margin. All the surgeries were done under peribulbar anesthesia under a microscope by same single surgeon using the same technique. Taking all aseptic precautionary, eyelid was then separated by a speculum, and subconjunctival and subpterygial 0.5 ml lignocaine solution (xylocaine 2%) was injected. Gentle massage over the lesion was applied by cotton-tipped applicator for few seconds. The neck of the pterygium was then lifted up with the help of fine-toothed forceps, while the head of the pterygium was gently avulsed from the cornea by placing closed tips of a curved

corneal scissors or Iris repository underneath the neck of the pterygium mass, keeping the same constant tractional force throughout. Gentle dissection was then carried out in-between the conjunctiva and the sclera with the help of an angled or curved Vannas scissors to resect at least 4-5 mm of pterygium mass that included both the superior and inferior border. Neither cautery nor saline irrigation was used throughout the surgery, except tamponade with cotton-tipped applicator whenever required to check excess hemorrhage. The size of the bare sclera defect was then measured with Castroviejo calipers. Corneal care was taken by applying viscoelastics throughout the procedure. Now approximately 0.5 ml xylocaine 2% was used to balloon up an superotemporal or superior conjunctival flap. Vannas scissor was used to make a fine film of 0.5 mm oversized, free conjunctival graft, carefully avoiding inclusion of tenon, or making buttonhole within it. The graft was then laid over the bare sclera ensuring same limbus to limbus orientation. We waited for 5-10 min for hemostasis to occur. In cases, where the surgeon appreciated the lack of adequate amount of bleed at the recipient site, episcleral blood vessel was intentionally punctured to create bleeding. The eye was then patched for 24h with 0.5% moxifloxacin eyedrop. Any intraoperative complication, as well as the operative time, was documented. Next day, the eye was assessed for symptom, graft adherence, or any complication (s) under slit lamp. Postoperatively, patient was put on topical gatifoxacin 0.3% eye drop four times daily for 4 weeks, loteprednol etabonate 0.5% eye drop four times daily for first 1 weeks thereafter tapered over next 3 weeks and carboxymethyl cellulose 1% eye drop four times daily for 4 weeks (Refresh Liquigel®, Allergan, Inc., USA). Thereafter, an attempted follow-up of cumulative 2 months (at postoperative day 1, 7, 30, and 60) was done to every patient. At each postoperative visit, thorough slit lamp examination, tonometry, and photo documentation were done, and any recurrence, complication (s), or any complaint were recorded. The primary outcome measure was the recurrence and the secondary measures were complication (s) and surgical time. We defined (1) "recurrence" as the reappearance of fibrovascular growth at the site of previous pterygium excision extending beyond the limbus onto the clear cornea. (2) "Complication" as any adverse event related to (a) the surgery in the intra- and post-operative period, (b) the graft itself, or (c) the drugs prescribed.

## Results

A total of seventy eyes of seventy patients underwent primary pterygium excision followed by SLGL-CAG. There were 52 females (74.2%) and 18 males (25.7%) with mean age (38.83±9.2 years and 38.88±6.5 years, respectively, with the highest incidence seen among 40–50 years aged (33 eyes, 47.1%). Grade II pterygium was found to be the most common grade (46 eyes, 65.7%), followed by Grade III (15 eyes; 21.4%) and Grade I (8 eyes; 11.4%). One had Grade IV (1.4%); no one had bilateral, temporal, or double-head pterygium. Most common indication of surgery was cosmetic blemish (51 eyes, 72.8%), followed by diminution of vision (15 eyes, 21.4%) and recurrent inflammation (4 eyes, 5.71%). Mean operative time was 20±2 min, range 18-22 min. Follow-up ≥ 2 months observed in 100% patients. Postoperatively, no recurrence was seen at 2 months follow-up.

Partially displaced graft (hence, graft-related complication) was noticed in four patients (5.71%) at the first postoperative day, who underwent resurgery, whereby the graft was repositioned and sutured in its proposed site under regional anesthesia that finally resulted in uneventful recovery without any recurrence. Granuloma and graft edema is seen in 2 patients (2.85%) each. No other complication (s) related to the graft, surgery, or drugs were evident until the end of our study. Mean difference between pre- and post-operative IOP (14±3 mmHg and 15±3 mmHg).

**Table 1:** Pterygium and sex distribution

Sex	Total	percentage
Male	18	(25.7%)
Female	52	(74.2%)

**Table 2:** Age wise chart

Age	Total	percentage
20-30	3	(4.2%)
31-40	21	(30%)
41-50	33	(47.1%)
51-65	13	(18.5%)

**Table 3:** Grades of pterygium and age

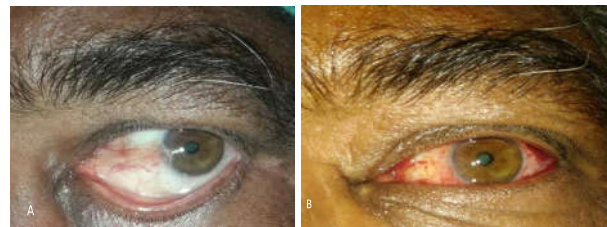
Age	G1	G2	G3	G4	total
20-30	3	9	1	0	13(18.5%)
31-40	3	14	4	0	21(30%)
41-50	2	21	9	1	33(47.1%)
51-65	0	2	1	0	3(4.2%)
total	8(11.4%)	46(65.7%)	15(21.4%)	1(1.4%)	70

**Table 4:** Indications of surgery

Indications	Number	Percentage
Cosmetic	51	(72.8%)
Diminution of vision (Dov)	15	(21.4%)
Recurrent inflammation	4	(5.71%)

**Table 5:** Complications

Complications	Number	Percentage
Graft dehiscence	4	(5.71%)
Granuloma	2	(2.85%)
Graft edema	2	(2.85%)



**Fig. 1:** A. Pre-op of patient with Pterygium. B. Post op day 1.

## Discussion

Pterygium is a degenerative and proliferative disorder of bulbar conjunctiva and its severe form can cause visual impairment.

In present study we have seen higher prevalence of pterygium in female (74.2%). Reason for higher prevalence could be higher cosmetic awareness among women and greater outdoor exposure of women in order to earn livelihood. Most of patients in present study were from in middle age group (41-50 years).

Pterygium surgery should ideally have a low or no recurrence, minimal complications and be cosmetically acceptable. Conjunctiva autograft using sutures was a standard procedure. The grafts were stable with acceptable cosmetic results. Suture related problems like postoperative inflammation, granuloma formation, pain, foreign body sensation were present. Suturing is more time consuming, lead to higher postoperative discomfort, higher recurrence, and complications than others,

such as prolonged healing, fibrosis, and granuloma formation. Fibrin glue usage is faster and simpler with less postoperative complications. Fibrin glue is expensive and difficult to obtain. Foreign materials or Plasma derived products such as fibrin glue may produce possible hypersensitivity reactions or anaphylaxis in susceptible individuals and transmission of viral diseases. Recent introduction of auto graft technique using patient's own blood as bioadhesive substance on the excised bed of the pterygium has gained popularity. The technique has eliminated several disadvantages encountered with earlier methods. It has minimized the surgical time, trauma to the conjunctiva, cost of surgery and recurrence rate. In our series, the operation time was only 18 to 22 minutes and there was no single case of pterygium recurrence after 2 months of surgery though we had 4 cases of graft recession.

Sutureless and glueless conjunctival auto graft using blood clot as a bioadhesive is a useful alternative method for graft fixation in pterygium surgery. We found the new procedure of auto grafting free of any untoward complications. Sutureless and glueless autologous graft has no extra cost or associated risks and can overcome the post-operative irritation, pain and foreign body sensation to a great extent. The procedure was cosmetically better. The opposition of the lids to the bulbar conjunctiva provides a natural biological dressing and confers a unique wound healing environment<sup>[4]</sup>. The main disadvantage of this method is the risk of graft getting lost in the immediate post-operative period. Graft loss is usually seen in first 24 to 48 hours. These complications were associated with larger grafts. This could be due to inadequate excision of the pterygium tissue or leaving too much tenons tissue on the graft. Meticulous dissection of the sub-epithelial graft tissue is respected.

We here postulate that this technique is easier to learn and perform, but simultaneously emphasize the paramount importance of the need to adopt special precaution in patient selection, meticulous pterygium tissue excision, taking tenon free slightly oversized graft, leaving the subgraft area free of hemorrhage, and waiting period of at least 5-10 min at the end of surgery which gives clue to the overall success as advocated by Mitra [8] and Shaw et al.[9]

Limitations were, study population and follow-up time were relatively smaller, and it was nonrandomized and thus may seem to have a gender bias, noncomparative, recurrent cases were excluded. There was neither any attempt to quantify adhesive strength of autologous blood nor to correlate learning curve, visual improvement, and

socioeconomic factors that could otherwise have affected the surgical outcome, directly or indirectly.

## Conclusion

Pterygium excision and conjunctival auto graft with autologous blood is a viable and better surgical option for management of primary as well as recurrent pterygium. The feasibility of adherence of graft without glue and sutures is promising. The potential risks associated with the use of fibrin glue and suture related problems can be avoided in this technique. This procedure has excellent outcome. We found the recurrence, complication rate, and the operative time of SLGL CAG comparable with the current techniques in practice, without adding possible potential hazard of the surgical adjunct. However, a randomized multicenter trial with a larger cohort and longer follow-up is warranted to substantiate our findings is cost effective, time saving, easy to perform and safe for the patients with good cosmetic output.

### *Declaration of patient consent*

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

*Financial support and sponsorship:* Nil.

*Conflicts of interest:* There are no conflicts of interest.

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