

# A Comparative Study to Evaluate the Outcome of Sutureless Gluefree Versus Sutures in Conjunctival Autograft for Primary Pterygium Excision

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## ABSTRACT

**Introduction:** To compare and evaluate the mean duration of surgery, postoperative patients discomfort and efficacy of two surgical techniques for the management of primary pterygium.

**Material & Method:** A prospective randomized clinical trial. The study included 100 eyes of 100 patients with primary pterygium. Simple excision under local anesthesia was performed by closure of bare sclera by sutureless and gluefree conjunctival autograft in 50 eyes of 50 patients (Group 1) versus conventional method of a sutured conjunctival autograft in 50 eyes of 50 patients (Group 2).

**Results:** The Mean duration of surgery came out to be 16 minutes in Group 1 and 25.5 minutes in group 2. The postoperative discomfort, inflammation, subconjunctival haemorrhage was significantly less in group 1 as compared to group 2 at postoperative day 2 and 1 week follow-up. Graft stability and recurrence was found to be similar in both groups, which were statistically insignificant.

**Conclusion:** Sutureless and gluefree conjunctival autograft technique is easy, safe, effective, prevents potential adverse reactions and discomfort encountered with the use of sutures

to fix the conjunctival autograft with acceptable pterygium recurrence rate as compared conventional sutured autograft technique.

**Keywords:** Conjunctival autograft, Gluefree, Pterygium, Sutureless.

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## INTRODUCTION

Pterygium is a degenerative condition of the subconjunctival tissues which proliferate as vascularised granulation tissue to invade the cornea, destroying the superficial layers of the stroma and Bowman's membrane, the whole being covered by conjunctival epithelium<sup>1</sup>.

Symptoms result from its unsightly cosmetic appearance and involvement of visual axis causing decrease in visual acuity, astigmatism and increased glare. Intermittent episodes of inflammation cause irritation, watering and foreign body sensation. The difficulty in treating this deceptively benign disease stems from our lack of understanding of this condition, and its propensity for recurrence after surgical excision. There is a plethora of surgical and medical measures currently available for pterygium, with no consensus regarding the 'ideal' treatment<sup>2</sup>. Conjunctival autografting after pterygium excision is associated with very low rates of recurrence and complications when compared with other techniques. Nevertheless graft suturing has the disadvantage of longer surgery time and complications such as granuloma formation, giant papillary conjunctivitis and significant patient discomfort after surgery<sup>3</sup>.

Lately fibrin based glues for conjunctival autografting have been used to minimize operating time and discomfort associated with sutures<sup>4</sup> but apart from being costly, it has potential risk of transmission of prion disease and anaphylaxis in susceptible individuals.

Keeping in mind scenario of developing countries, especially India, using patient's own in-situ blood coagulum acting as bio adhesive or fixator to fix the conjunctival graft has emerged as a cost effective and safe option along with minimal patient discomfort. Compared to developed countries, studies comparing outcome of sutureless glue free and sutures have been fewer.

## MATERIALS AND METHODS

A total of 100 patients with primary pterygium attending the outpatient department, who fulfilled the inclusion and exclusion criteria were selected and were assigned randomly to a particular group each of 50 patients.

### Inclusion Criteria

Patients with primary pterygium encroaching upon visual axis, inducing visually significant astigmatism of 1 D or more, causing recurrent inflammation or cosmetically bothersome to the patients.

### Exclusion Criteria

- Recurrent pterygium
- Atrophic pterygium
- Patients on anticoagulants
- Patients with pre-existing glaucoma
- Patients with immune system disease, eyelid or ocular surface diseases for example- blepharitis, Sjogren syndrome and dry eye.

### Method of study

After informed consent, patients fulfilling the inclusion and exclusion criteria were included in the study. All patients underwent a comprehensive ophthalmological examination. In undilated eye grading of the pterygium was done based on the following<sup>5</sup>

Grade I: Head of the pterygium between limbus and a point midway between limbus and pupillary margin (P1).

Grade II: Head of the pterygium present between point midway between limbus and pupillary margin (P1) and the pupillary margin (P2).

Grade III: crossing papillary margin.

### Surgical technique

50 patients underwent pterygium excision with sutureless gluefree conjunctival autografting and 50 patients underwent pterygium excision with conjunctival autografting using 10-0 nylon sutures by a single senior surgeon.

All cases were taken up under peribulbar block. The involved eye underwent sterile preparation and draping. Rigid lid speculum was applied. Pterygium excision was done either by avulsion technique or, head of pterygium dissected from apex using surgical blade (15 number) taking care to follow the surgical plane of the pterygium followed by excision of the conjunctival extent. Underlying tenons was removed upto bare sclera.

For harvesting the conjunctival autograft the inferior temporal quadrant of bulbar conjunctiva was injected with 1cc of local anaesthesia (xylocaine 2%) to facilitate separation of the conjunctiva from Tenon's capsule. A thin tenon's free conjunctival graft was harvested taking care not to buttonhole the conjunctiva and to include limbal stem cells in the graft. The size of the defect (in mm<sup>2</sup>) was measured with Castoveijo calipers. Care was also taken to see to it that harvested graft was about 1 mm larger than the size of bare sclera. In patients in the suture group the graft with the epithelial side up was placed on the bare sclera and was secured with 4-6 sutures using 10-0 nylon. All the sutures were buried underneath. Eye was bandaged with eye drop moxifloxacin 0.5%.

In patients in the sutureless gluefree group, bare sclera was made to bleed by scraping it with surgical blade [15 number]. Haemostasis was allowed to occur spontaneously without use of cautery to provide autologous fibrin to glue the conjunctival autograft naturally in position without tension. Conjunctival autograft was taken as described. Now the graft was flipped on to bare sclera, with epithelial side up and pressed gently to the scleral bed milking out any excess blood and the scleral bed was viewed through the transparent conjunctiva to ensure that residual bleeding did not lift the graft. Small central haemorrhages were tamponed with direct compression. The graft was held in position for 10 minutes by application of gentle pressure over the graft with fine non-toothed forceps. Stabilization of graft was tested with Meroceal sponge centrally and on each free edge to ensure firm adherence to the sclera. Eye was bandaged for 48 hours after instilling eye drop moxifloxacin 0.5%.

### GRADING OF POST OPERATIVE DISCOMFORT<sup>3</sup>

Grade 0: None or no symptoms

Grade 1: Very mild or that symptom is easily tolerated Grade 2: Mild or that symptom causes some discomfort

Grade 3: Moderate or that symptoms partially interferes with daily activities

Grade 4: Severe or that symptoms interferes completely with usual activities or sleep.

### GRADING OF INFLAMMATION<sup>3</sup>

Grade 0- No dilated corkscrew vessel in graft

Grade 1- 1 bright red, dilated corkscrew vessel crossing the graft bed margin.

Grade 2: 2 bright red dilated corkscrew vessels crossing the graft bed margin.

Grade 3: 3 bright red dilated corkscrew vessels crossing the graft bed margin.

Grade 4:  $\geq 3$  bright red dilated corkscrew vessels crossing the graft bed margin.

### GRADING OF SUBCONJUNCTIVAL HAEMORRHAGE<sup>3</sup>

Grade 0- none

Grade 1-  $\leq 25\%$  of size of the graft

Grade 2 -  $\leq 50\%$  of size of the graft

Grade 3-  $\leq 75$  of size of graft

Grade 4- Haemorrhage involving the entire graft.

### GRADING OF GRAFT STABILITY<sup>3</sup>

Grade 0: All four sides of the graft margin are well apposed

Grade 1: Gaping/displacement of one side of the graft-bed junction

Grade 2: Gaping/displacement of two sides of the graft-bed junction

Grade 3: Gaping/displacement of three sides of the graft-bed junction

Grade 4: Graft completely displaced from the bed.

## RESULTS

The mean duration of surgery in the sutureless gluefree group was found to be 16 minutes (range 14-19 min) and in the suture group was found to be 25.5 minutes (range 21-30 min). The difference between the 2 groups was found to be highly statistically significant ( $p=0.000$ ).

On post-operative day 2, in sutureless gluefree group 30 had grade 1 and 12 had grade 2 discomfort. In suture group 12 had grade 1 and 32 had grade 2 discomfort. The difference between the 2 groups was found to be statistically significant ( $p=0.000$ ).

At 1 week post-operative follow-up, in sutureless gluefree group, 30 patients had grade 0 and 16 had grade 1 discomfort. In suture group, 22 patients had grade 1 and 18 had grade 2 discomfort. The difference between the 2 groups was found to be statistically significant ( $p=0.000$ ) (Table- 1).

On post-operative day 2, in sutureless gluefree group, 8 patients had grade 0 and 36 had grade 1 inflammation. In suture group 20 had grade 1 and 22 had grade 2 inflammation. The difference between the 2 groups was found to be statistically significant ( $p=0.001$ ).

At 1 week post-operative follow-up in sutureless gluefree group, 30 patients had grade 0 and 16 had grade 1 inflammation. In suture group, 10 patients had grade 0, 28 had grade 1 and 10 had grade 2 inflammation. The difference between the 2 groups was found to be statistically significant ( $p=0.001$ ) (Table- 2).

On day 2, in sutureless gluefree group, 34 patients had grade 0 and 10 had grade 1 subconjunctival haemorrhage. In suture group, 30 patients had grade 0 and 14 had grade 1 subconjunctival haemorrhage. The difference between the 2 groups was not found to be statistically significant ( $p=0.887$ ).

At 1 week post-operative follow-up, in sutureless gluefree group, 36 patients had grade 0 and 10 had grade 1 subconjunctival haemorrhage. In suture group, 38 patients had grade 0 and 8 had grade 1 subconjunctival haemorrhage. The difference between the 2 groups was not found to be statistically significant (p=0.797). (Table- 3) On day 2, in sutureless gluefree group, 42 patients had grade 0, 8 had grade 1 graft stability. In suture group, 44 patients had grade 0, 6 had grade 1 graft stability. The difference between the 2 groups was not found to be statistically significant (p=0.745). At 1 week post-operative follow-up, in sutureless gluefree group, 46 patients had grade 0, 4 had grade 1 and none had grade 2, 3 and 4 graft stability. In suture group, 48 patients had grade 0, 2 had grade 1 and none had grade 2, 3 and 4 graft stability. The difference between the 2 groups was not found to be statistically significant (p=0.644) (Table- 4)

At 1 month post-operative follow-up, none of the patients in sutureless gluefree group had any discomfort. Only 6 patients in suture group complained of grade 1 discomfort. The difference between the 2 groups was not statistically significant. None of the patients in either group had any inflammation, subconjunctival haemorrhage or graft instability.

At 3 month and 6 month follow-up, none of the patients in either group had any discomfort, inflammation, subconjunctival haemorrhage or graft instability except for 2 patients in suture group who showed suture granuloma at 3rd month follow-up. They were excised. 4 patients in sutureless gluefree group showed pterygium recurrence, two at 3rd month and the other two at 4th month follow-up. 4 patients in suture group showed recurrence, two at 4th month, one at 5<sup>th</sup> month and the other at 6th month followup.

**Table 1: Distribution According To Discomfort Grading Postoperatively**

Discomfort Grading	Number of patients in sutureless group			Number of patients in suture (s) group		
	Day 2	1 Week	1 Month	Day 2	1 Week	1 Month
G0	6	30	50	0	2	44
G1	30	16	0	12	22	6
G2	12	4	0	32	18	0
G3	2	0	0	6	8	0
G4	0	0	0	0	0	0

**Table 2: Distribution According To Inflammation Grading Postoperatively**

Inflammation Grading	Number of patients in sutureless group			Number of patients in suture (s) group		
	Day 2	1 Week	1 Month	Day 2	1 Week	1 Month
G0	8	30	50	0	10	50
G1	36	16	0	20	28	0
G2	6	4	0	22	10	0
G3	0	0	0	8	2	0
G4	0	0	0	0	0	0

**Table 3: Distribution According To Subconjunctival Haemorrhage (Sch) Grading On Postoperative Day 2**

SCH Grading	Number of patients in sutureless gluefree group			Number of patients in suture group		
	Day 2	1 Week	1 Month	Day 2	1 Week	1 Month
G0	34	36	50	30	38	50
G1	10	10	0	14	8	0
G2	6	2	0	0	4	0
G3	0	0	0	0	0	0
G4	0	2	0	0	0	0

**Table 4: Distribution According To Graft Stability Grading On Postoperative Day 2**

Graft Stability Grading	Number of patients in sutureless group			Number of patients in suture (s) group		
	Day 2	1 Week	1 Month	Day 2	1 Week	1 Month
G0	42	46	50	8	48	50
G1	44	4	0	6	2	0
G2	0	0	0	0	0	0
G3	0	0	0	0	0	0
G4	0	0	0	0	0	0

**DISCUSSION**

The 2 groups were compared in terms of duration of surgery, post-operative discomfort, inflammation, sub-conjunctival haemorrhage, graft stability at 2nd day, 1st week, 1st month, 3rd month and 6th month and recurrence of pterygium. Majority of the patients were in the age group 21-50 years (86 patients, 86.0%). 12 patients (12.0%) were aged between 51-70 years. 2 patients (2%) were aged below 20 years. Out of 100 patients, 68 were males and 32 patients were females. Majority of the patients had grade II pterygium, being 62 in number (62.0%). 28 patients (28.0%) had grade I and 10 patients (10%) had grade III pterygium.

The mean duration of surgery in the fibrin glue group was found to be 16 minutes (range 14-19 min) and in the suture group was found to be 25.5 minutes (range 21-30 min). The operation time was significantly shorter in the sutureless gluefree group than it was in the suture group (p=0.000).

In the study by Shabaan A.M. Elwan et al,<sup>6</sup> the average surgery time was 24 minutes (±5.64minutes) for sutureless gluefree and 28.64 minutes (range ±6.45minutes) for sutures, p<0.001. In the study by Ashok Sharma et al<sup>7</sup>, the mean duration of surgery was 23.20 minutes (±1.55 min) in sutureless gluefree group, and 37.76 minutes (±1.89 min) in suture group, the operation time being

significantly shorter in sutureless gluefree group ( $p=0.001$ ). Similar results were reported by Somnath Choudhary et al.<sup>8</sup>

In the present study, a significant difference was found in the degree of post-operative discomfort between the two groups at post-op day 2 and week 1 ( $p=0.000$  both at day 1 and week 1), with suture group being associated with more discomfort. The difference was not statistically significant at 1st month post-operatively ( $p=0.077$ ). At 3rd and 6th month follow-up none of the patients in either group had any discomfort.

Similar results were reported by Shaaban A.M.Elwan,<sup>6</sup> who found statistically significant higher patient satisfaction in patients who underwent sutureless glue free conjunctival autografting ( $p<0.002$ ), at 3weeks follow up. Ashok Sharma et al<sup>7</sup> in their study found that the intensity of post-operative pain, foreign body sensation ,irritation were seen in less number of patients (20%) and were of shorter duration (2 weeks) in the sutureless gluefree group as compared to 80% patients having symptoms lasting for 4 weeks in the suture group ( $p<0.001$ ). Somnath Choudhury et al<sup>8</sup> also reported fewer postoperative symptoms in sutureless gluefree group than suture group.

In the present study, a significant difference was found in the degree of post-operative inflammation between the two groups at post-op day 1 and week 1 ( $p=0.001$  both at day 1 and week 1), with suture group being associated with more postoperative inflammation. At 1st, 3rd and 6th month follow-up none of the patients in either group showed any inflammation except for one patient in suture group who had suture granuloma at 3rd month follow-up.

In the present study there was no significant difference in the degree of postoperative sub conjunctival haemorrhage between the 2 groups at day 1( $p=0.887$ ) and week 1( $p=0.797$ ) post-op. None of the patients in either group showed any sub-conjunctival haemorrhage at 1st, 3rd and 6th months postoperatively.

In the present study, conjunctival grafts fixed with autologous blood were as stable as those secured with sutures at day 1, week 1, 1st,3rd and 6th months postoperatively ( $p=0.745,p=0.644$  at day 1 and week 1 respectively). Somnath Choudhary et al<sup>8</sup> reported that graft failure and graft retraction were more in sutureless group(12.5%) as compared to sutured group(6.25%) but this difference was statistically insignificant.

Wit et al<sup>9</sup> proposed that apposition of the eyelids to the bulbar conjunctiva provides a natural biological dressing, compression and a smooth frictionless surface. They also postulated that sutureless gluefree graft resulted in even tension across the whole graft interface and no direct tension on the free edges resulting in reduced stimulus for sub-conjunctival scar formation.

Thus the results in the present study in terms of graft stability were similar to those found in previous studies.

4 patients in sutureless gluefree group showed pterygium recurrence, two at 3rd month and the other two at 4th month follow-up. 4 patients in suture group showed recurrence, two at 4th month, one at 5<sup>th</sup> month and the other at 6th month follow-up. Massautis et al,<sup>10</sup> stated that the concept of surgical success in pterygium surgery can be defined as the provision of white cosmetic conjunctiva, with no persistent symptoms and a low recurrence rate (<10%). The recurrence rate in our study agrees with The Massautis et al's criterion.

S.Elwan et al<sup>6</sup> reported recurrences in 6% of patients in the sutureless gluefree group and in 8% of patients in the suture group, at 6 months follow-up.

Similar results were reported by Ashok Sharma et al,<sup>7</sup> Somnath Choudhury et al.<sup>8</sup>

Thus the results in present study in terms of recurrences were similar to those found in previous studies.

## CONCLUSION

Sutureless and gluefree conjunctival autograft technique is easy, safe, effective, prevents potential adverse reactions and discomfort encountered with the use of sutures to fix the conjunctival autograft with acceptable pterygium recurrence rate as compared conventional sutured autograft technique.

## REFERENCES

1. Sihota R, Tandon R. Diseases of the conjunctiva. In: Parson's Diseases of the Eye. 21st ed. New Delhi: Elsevier; 2011.
2. Tan D, Chan C. Management of pterygium. In ;Krachmer JH, Mannis MJ, Holland EJ. Cornea – Fundamental diagnosis and management, 3rd ed. Philadelphia: Mosby Elsevier;2011.
3. Karalezli A, Kucukerdonmez C, Akova YA, Altan-Yaycioglu R, Borazan M. Fibrin glue versus sutures for conjunctival autografting in pterygium surgery: a prospective comparative study. Br J Ophthalmol. 2008 Sep;92(9):1206-1210.
4. Farjo QA, Sugar A. Pterygium and conjunctival degenerations. In :Yanoff M, Duker JS. Ophthalmology, 3rd ed. Philadelphia : Mosby Elsevier;2009.
5. Maheshwari S. Pterygium-induced corneal refractive changes. Indian J Ophthalmol. 2007 Oct;55(5):383-386.
6. Elwan SA. Comparison between sutureless gluefree versus sutured limbal conjunctival autograft in primary pterygium surgery .Saudi J Ophthalmology 2014;28:292-8.
7. Sharma, Ashok et al. "Sutureless and Glue-Free Versus Sutures for Limbal Conjunctival Autografting in Primary Pterygium Surgery: A Prospective Comparative Study." Journal of Clinical and Diagnostic Research : JCDR 9.11 (2015): NC06–NC09. PMC. Web. 7 May 2016.
8. Choudhury, Somnath, et al. "Comparison of autologous in situ blood coagulum versus sutures for conjunctival autografting after pterygium excision." International ophthalmology 34.1 (2014): 41-48.
9. Wit D, Athanasiadis I, Sharma A, Moore J. Sutureless and gluefree conjunctival autograft in pterygium surgery: a case series. Eye 2010;24:1474-7.
10. Massautis P, Khemka S, Ayliffe W. Clinical outcome study of a modified surgical technique for pterygium excision. Can J Ophthalmol 2006;41:704-8.

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