



COMPARISON BETWEEN SURGICAL OUTCOME OF SUTURELESS GLUE FREE VERSUS SUTURED LIMBAL CONJUNCTIVAL AUTOGRAFT IN PRIMARY PTERYGIUM SURGERY

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ABSTRACT

Objectives of the study: To compare the surgical outcome between suture less glue free versus sutured limbal conjunctival autograft in primary pterygium excision surgery. **Material and Methods:** The study was conducted on a sample size of 100 patients out of which 50 patients underwent suture less glue free technique and 50 patients underwent sutured technique of conjunctival limbal autograft for primary pterygium excision. **Results:** No significant difference was found in degree of postoperative haemorrhage under graft between the groups ($p = 0.593$ and $p = 0.603$, on the first day and first month respectively. None at 3rd month follow up. The degree of inflammation was significantly less in sutureless glue free group than with sutures on first day ($p=0.0000$) postoperatively. No significant difference was found in first month ($p=0.387$) and third month ($p=0.315$). Conjunctival grafts secured with sutureless gluefree were as stable as those secured with sutures namely, $p=0.603$, $p=0.695$ and $p=1.0000$ on first day, first month and third month respectively. Degree of post-operative discomfort was significantly less in sutureless gluefree group than in sutures as observed in the values $p=0.0000$, $p=0.023$ on first day and first month respectively. No discomfort was reported in third month follow up in either group. We conclude from our study that conjunctival limbal autografts secured with sutureless glue free technique during pterygium surgery not only was as stable as those secured with sutures, but also produce significantly less inflammation and discomfort. Sutureless glue free CLAG can be recommended as it is easy, safe, effective and prevents potential adverse reactions like hypersensitivity reactions encountered with the use of foreign materials like glue.

KEYWORDS : Sutureless, Gluefree, Limbal Conjunctival, Autografting, Pterygium.

INTRODUCTION

Pterygium is a pinkish triangular wedge-shaped growth of conjunctival tissue. It proliferates as a vascularized granulomatous tissue to invade the corneal surface, in addition to the obvious cosmetic concerns, it can induce corneal astigmatism. The induced corneal astigmatism may cause significant visual impairment and may require surgery. It is influenced by age and solar radiation. Although it can be easily excised, it has a high rate of recurrence ranging from 24% to 89%.²

A number of surgical techniques have been described as methods for management of pterygium, including bare sclera resection, bare sclera resection followed by mitomycin C application at different point of time, doses, and concentrations, and pterygium excision plus conjunctival autografting or amniotic membrane placement.⁵ Conjunctival autografting has also been advocated for the management of recurrent pterygium.⁶ Limbal-conjunctival autograft is currently the most popular surgical procedure as it has been suggested that including the limbal stem cells act as a barrier to the conjunctival cells migrating onto the corneal surface.

The most common method of autograft fixation is suturing with drawbacks like increased operating time, postoperative discomfort, inflammation, buttonholes, necrosis, giant papillary conjunctivitis, scarring and granuloma formation.⁷

Replacing sutures with tissue adhesive like glue is widely used due to many advantages like easy fixation of the graft, shorter operation time, reduction in complications and postoperative discomfort but at the same time has some disadvantages also like high cost, the risk of transmission of infections and inactivation by iodine preparations.⁸⁻¹⁰ Sutureless and glue-free conjunctival autograft is a new, easy and cheaper technique for the management of pterygium. The available literature comparing sutureless and glue-free conjunctival autograft with sutured conjunctival autograft is scanty. Further in view of problems encountered with the sutured graft and the trend towards increasing use of sutureless and glue-free grafting for pterygium surgery, a comparative study can throw light on the two techniques simultaneously comparing their merits and demerits, hence the current study was undertaken.

METHODS

A prospective, comparative study to evaluate the efficacy of sutureless glue free technique versus sutured technique of conjunctival limbal autograft for primary pterygium. This study was conducted between February 2020 and March 2021. All surgeries were done by single surgeon. The study was conducted on a sample size of 100 patients out of which 50 patients underwent sutureless glue free technique and 50 patients underwent sutured technique of conjunctival limbal autograft

for primary pterygium excision. Patients were selected in random. Patients aged 20 and above took part in this study.

Inclusion criteria :

1. Primary nasal pterygium
2. Age older than 20 yrs.

Exclusion criteria:

1. Temporal pterygium
2. Recurrent pterygium
3. Patient on anticoagulants
4. Pseudopterygium
5. Patient with pre existing glaucoma
6. Patients with other coexisting ocular diseases like scleritis, uveitis.
7. Previous ocular trauma or surgery in that eye.
8. Corneal degeneration Patients were explained about the sutureless glue free technique and sutured technique. Informed consent for the surgery was taken.

Preoperative evaluation is done by Ocular examination, Visual acuity by Snellen's chart, Near vision by Jaeger's chart. Best corrected visual acuity by streak retinoscopy and automated refractometry, Keratometry by manual and automated refractometry, Intra ocular pressure by goldmann applanation tonometer, Grading and thickness of pterygium by Slit lamp bio-microscopy. Grading of the pterygium was done based on the following grading system. 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 midway between point (P1) and the pupillary margin (P2), Grade III- Head of pterygium crossing the pupillary margin (P2). Fundus examination by direct and indirect ophthalmoscopy. Slit lamp bio-microscopy with +78D lens

Surgical technique is performed as follows. All cases were taken up with peribulbar block. The involved eye underwent sterile preparation and draping. An eyelid speculum applied for maximal ocular exposure. Pterygium excision consisted of detachment of pterygium head using a no.15 surgical blade and dissection of the body from the overlying conjunctiva in a smooth clear plane as possible using blunt and sharp dissection. Subsequently, the subconjunctival pterygium tissue and the thickened segment of conjunctiva and adjacent tenons capsule were excised leaving bare sclera. Then the size of bare sclera was measured with callipers and the area documented in mm. For harvesting the conjunctival autograft the globe is rotated downward. Subconjunctival injection of 1cc normal saline was done in the superotemporal quadrant to facilitate separation of the conjunctiva from tenons capsule then a marker was used to mark the four corners of conjunctival limbal graft to be created 2 mm larger in width and length than the recipient

bed . A small opening was created and careful blunt dissection with wescott scissors was performed until the entire graft was free from tenons reaching the limbus to include limbal stem cells that act as a barrier to the conjunctival cells migrating onto corneal surface. Subsequently the edges of the graft were cut by vannas scissors. Forceps is used to gently slide the graft to the recipient bed with the epithelial side up and keeping the limbal edge towards the limbus. In sutureless glue free group, haemostasis was allowed to occur spontaneously without use of cautery to provide autologous fibrin to glue the conjunctival autograft naturally in position without tension and the sclera 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 min as normal clotting time ranges from 4-9 minutes in humans. The graft was held in position by application of gentle pressure over the graft. The stabilization of the graft was tested centrally and on each free edge to ensure firm adherence to sclera. The eye was bandaged. In sutured group the graft was sutured in position with 8-0 vicryl. First the two limbal corners were secured with episcleral bites keeping the limbal edge of the graft on gentle stretch. Then the posterior corners of the graft were sutured to the bulbar conjunctiva and additional sutures were placed if required to close the edges depending on the size of the graft. Both groups received subconjunctival injection of corticosteroid and antibiotic at the end of the procedure in inferior quadrant and the eye was bandaged.

Post-operative care is done on first post-operative day patients were examined and started on steroid - antibiotic eye drops 4 times a day for 1 month and lubricant eye drops 4 times per day for 1 month.

Subsequent follow up visits were at 1st and 3rd month postoperatively. Unabsorbed sutures were removed after 1 month. Patients were evaluated for inflammation, hemorrhage under graft, graft stability and degree of discomfort.

Statistical analysis is done by recording data on a pre-designed proforma and managed on an excel spread sheet. All the entries were checked for any possible keyboard error. chi-square test was used for statistical analysis. A p-value less than 0.05 (p<0.05) is considered as statistically significant. Suggestive significance (P value: 0.05< P<0.10) Moderately significant (P value:0.01<P ≤ 0.05) Strongly significant (P value : P0.01) Statistical software: The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0 and R environment ver.2.11.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

RESULTS

In our study, all patients had primary nasal pterygium. Conjunctival limbal autograft was secured with sutures in 50 patients and with sutureless glue free technique in 50 patients. Of 100 patients, 38 were men and 62 were women. All patients were aged between 20-80 years .Grade 1 pterygium was in 10 (20%) patients under suturefree, gluefree group and 9 (18%) patients under suture group. Grade 2 nasal pterygium was recorded in 34 (68%) patients under suturefree gluefree group and 33 (66%) under suture group. Grade 3 pterygium was observed in 6 (12%) under suturefree gluefree group and 8 (16%) under suture group.

(Table 1) Distribution of patients according to grade

GRADE	Treatment			
	Sutureless glue free group		Suture group	
	n%	N%	n%	N%
Grade I	10	20.00	09	18.00
Grade II	34	68.00	33	66.00
Grade III	06	12.00	08	16.00
Grade IV	50	100.00	50	100.00

No significant difference was found in degree of postoperative haemorrhage under graft between the groups (p = 0.593 and p = 0.603, on the first day and first month, respectively. None of the patients had haemorrhage under graft at 3rd month follow up.

(Table 2) Hemorrhage under Graft

HEMORRHAGE UNDER GRAFT	HEMORRHAGE UNDER GRAFT											
	1 st POST OPERATIVE DAY				1 MONTH POST OPERATIVE DAY				3 MONTH POST OPERATIVE DAY			
	SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP	
	n	%	N	%	n	%	N	%	n	%	N	%
None	45	90	43	92	47	94	46	92	50	100	50	100
<25% of size of the graft	04	8	04	8	03	6	03	6	00	0	00	0
<50% of size of the graft	01	2	03	6	00	0	01	2	00	0	00	0
<75% of size of the graft	00	0	00	0	00	0	00	0	00	0	00	0
Hemorrhage involving entire graft	01	2	00	0	00	0	00	0	00	0	00	0
Total	50	100	50	100	50	100	50	100	50	100	50	100
p- value	0.593				0.603				none			

The degree of inflammation was significantly less in suture free glue free group than with sutures on first postoperative day (p=0.0000) . No significant difference was found for inflammation in first month (p=0.387) and third month (p=0.315) postoperatively.

(Table 3) Graft Inflammation

GRAFT INFLAMMATION	GRAFT INFLAMMATION											
	1 st POST OPERATIVE DAY				1 MONTH POST OPERATIVE DAY				3 MONTH POST OPERATIVE DAY			
	SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP	
	n	%	N	%	n	%	N	%	n	%	N	%
No dilated corkscrew vessels in graft	26	52	08	26	48	96	45	90	50	100	49	98
1 bright red dilated corkscrew vessels crossing graft bed margin	22	44	29	58	01	2	04	8	00	0	01	2
2 bright red dilated corkscrew vessels crossing graft bed margin	02	4	13	26	01	2	01	2	00	0	00	0
3 bright red dilated corkscrew vessels crossing graft bed margin	00	0	00	0	00	0	00	0	00	0	00	0
>3 bright red dilated corkscrew vessels crossing graft bed margin	00	0	00	0	00	0	00	0	00	0	00	0
Total	50	100	50	100	50	100	50	100	50	100	50	100
p- value	0.000				0.387				0.315			

Conjunctival grafts secured with suturefree gluefree were as stable as those secured with sutures namely, p=0.603, p=0.695 and p=1.0000 on first day, first month and third month

respectively, except one patient who had total displacement of the graft and was secured with sutures on 1st post-operative day . Degree of post-operative discomfort was significantly less in sutureless gluefree group than in sutures as observed in the values p=0.0000, p=0.023 on first day and first month respectively. No discomfort was reported in third month

(Table-4) Graft Stability

GRAFT STABILITY	1 ST POST OPERATIVE DAY				1 MONTH POST OPERATIVE DAY				3 MONTH POST OPERATIVE DAY			
	SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP	
	n	%	N	%	N	%	N	%	n	%	N	%
All 4 sides of the graft margin are well apposed	45	90	46	92	46	92	47	94	48	96	48	96
Gaping or displacement of one side of graft-bed junction	04	8	04	8	04	8	03	6	02	4	02	4
Gaping or displacement of two side of graft-bed junction	00	0	00	0	00	0	00	0	00	0	00	0
Gaping or displacement of three side of graft-bed junction	00	0	00	0	00	0	00	0	00	0	00	0
Graft completely displaced from the bed	01	2	00	0	00	0	00	0	00	0	00	0
Total	50	100	50	100	50	100	50	100	50	100	50	100
p-value	0.603				0.695				1.000			

(Table-5) Patient Discomfort

Patient discomfort	PATIENT DISCOMFORT											
	1 ST POST OPERATIVE DAY				1 MONTH POST OPERATIVE DAY				3 MONTH POST OPERATIVE DAY			
	SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP		SUTURE FREE GLUE FREE GROUP		SUTURE GROUP	
	n	%	N	%	n	%	N	%	n	%	N	%
None or no symptoms	40	80	02	4	50	100	43	86	50	100	50	100
Very mild pain easily tolerated	08	16	33	66	00	0	04	8	00	0	00	0
Mild pain with some discomfort	02	4	15	30	00	0	03	6	00	0	00	0
Moderate pain or symptoms partially interferes with daily activities.	00	0	00	0	00	0	00	0	00	0	00	0
Severe pain or symptoms interferes completely with usual activities or sleep	00	0	00	0	00	0	00	0	00	0	00	0
Total	50	100	50	100	50	100	50	100	50	100	50	100
p-value	0.000				0.023				None only			

follow up in either group. There were no recurrences during the third month follow up in any of the patients.

DISCUSSION

We conclude from our study that conjunctival limbal autografts secured with sutureless glue free technique during pterygium surgery not only was as stable as those secured with sutures, but also produce significantly less inflammation and discomfort. There was no significant difference in haemorrhage at the graft bed amongst either groups .Sutureless and glue free conjunctival limbal autograft technique is easy, safe, effective, prevents potential adverse reactions encountered with the use of foreign materials. Foreign materials used in ocular surface surgery may lead to local complications such as discomfort, scarring, or infection. Plasma-derived products such as fibrin glue may produce possible hypersensitivity reactions where even the risk of viral transmission remains. This is a simple method of achieving conjunctival limbal autograft adherence during pterygium surgery avoiding potential complications associated with the use of fibrin glue or sutures.

CONCLUSION

Sutureless glue free conjunctival limbal autograft can be recommended as it is easy, safe, effective and prevents potential adverse reactions like hypersensitivity reactions encountered with the use of foreign materials like glue. Sutureless glue free conjunctival limbal autograft is economical unlike glue. Mean operating time involved in sutureless glue free conjunctival limbal autograft is lesser than compared to sutured conjunctival limbal autograft and can be recommended. Suture related complications like post-operative discomfort, redness, photophobia, suture related granuloma can be avoided in sutureless glue free technique. Sutureless glue free conjunctival limbal autograft are as stable as sutured conjunctival limbal autograft

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