

*Research Article***Evaluation of Sutureless Glueless Conjunctival Autograft in Pterygium Surgery**

Yahia M. Khairat, Ahmed M. Sabry, Mohamed F. Khalil and Mohamed A. Abd Elrazik
Department of Ophthalmology, El-Minia Faculty of Medicine

Abstract

Aim of the Study: Evaluation of sutureless glueless conjunctival autograft in pterygium surgery.

Patients and Methods: This study is a prospective, non-comparative, interventional study included 30 eyes having pterygia requiring surgical excision. The study was carried out at the department of ophthalmology at Minia university hospital from January 2018 to October 2018. All cases had been operated with conjunctival autografts taken from superior bulbar conjunctiva. Grafts were fixed using patients own blood clot as tissue adhesive which oozed in the bare sclera after **pterygium excision.**

The patients were followed up post operatively after 24 hours, 3 days, 1 week, 3 weeks, 6 weeks, 3 months and 6 months. **Results:** After 6 months follow up, neither symblepharon formation nor motility restriction or pyogenic granuloma were reported. Only one case of recurrence was reported.

Conclusion: Sutureless and glueless conjunctival limbal autograft following pterygium excision is safe, easy, effective and economic technique in both primary and recurrent pterygium surgery.

Keywords: sutureless glueless, autograft, pterygium

Introduction

A pterygium is a wing-shaped corneal incursion of an aberrant conjunctival wound healing response, characterized by the centripetal growth of an altered squamous epithelium with goblet cell hyperplasia and an underlying stroma of activated proliferating fibroblasts, neovascularization, inflammatory cells, and extracellular matrix. Surgical removal is the treatment of choice, but recurrence remains the main challenge in pterygium surgery, there are numerous adjunctive measures described to reduce the recurrence rates after pterygium excision but they are also associated with severe, sometimes sight threatening complications, these may be broadly classified as medical methods, beta irradiation and surgical methods.^[1]

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.^[2]

The newest approach is autoblood graft fixation, a technique also known as suture- and glue-free autologous graft. With traditional sutures, the operative time is prolonged and there are exaggerated postoperative symptoms

of eye irritation, tearing, redness, foreign body sensation.^[3] The use of glue can take care of these problems, but the cost, availability and associated potential risks are constant problems.^[4]

In comparison, autologous blood is natural, has no extra cost or associated risks, and can overcome the postoperative irritations to a great extent.^[5]

Patients and Methods

This study is a prospective, non-comparative, interventional study included 30 eyes having pterygia requiring surgical excision. The study was carried out at the department of ophthalmology at Minia university hospital from January 2018 to October 2018.

The indication for surgical intervention was one or more of the following:

- 1- Diminution of vision either because of induced astigmatism or encroachment onto the pupillary area.
- 2- Marked cosmetic deformity.
- 3- Marked discomfort and irritation unrelieved by medical management.
- 4- Documented progressive growth towards the visual axis so that ultimate visual loss could reasonably be assumed.

All cases had been operated with conjunctival autografts taken from superior bulbar conjunctiva. Grafts were fixed using patients own blood clot as tissue adhesive which oozed in the bare sclera after pterygium excision.

Inclusion Criteria:

30 eyes with pterygia of patients of all ages and of either sex were included in the study.

Exclusion Criteria:

1. Any ocular surface disease.
2. History of previous ocular trauma.
3. Glaucoma to preserve conjunctiva.
4. Retinal pathology requiring surgical intervention.

All the patients underwent the following:

1. A detailed medical history .
2. A detailed ophthalmic history.
3. A full ophthalmic examination

including refraction, BCVA, slitlamp examination, fundus examination and tonometry.

4. Anterior segment photography.

5. Operative Procedure

- Peribulbar block was given with 50:50 mixture of 5ml of 2% Lignocaine and 0.5%

Bupivacaine with 150 units/ml of Hyaluronidase solution.

- 10% betadine solution was applied to conjunctival sac for 5 minutes.
- Application of eye surgical drape.
- A universal eye speculum was placed.
- The body of the pterygium was dissected 4mm from the limbus, down to the bare sclera.
- The pterygium was removed from the cornea by avulsion (Figure-1).

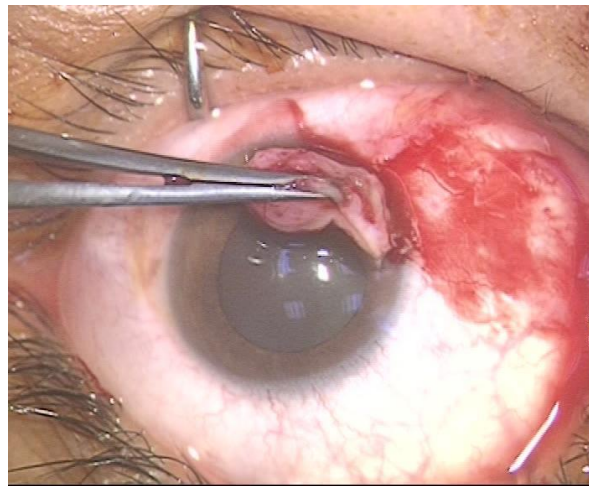


Figure (1): Pterygium removal by avulsion

- Where possible, haemostasis was allowed to occur spontaneously without the use of cautery.
- The size of the defect was measured with calipers.
- For harvesting the donor limbal conjunctival autograft, 0.5ml of 2% lignocaine was injected using 30 gauge needle subconjunctivally to

allow dissection between the conjunctiva and tenon's layer in the superior bulbar conjunctiva.

- Careful dissection between donor graft conjunctiva and Tenon's layer was done while fashioning the 1mm oversized conjunctivo-limbal graft from the superior bulbar conjunctiva including the superior limbal stem cells (Figure-2).

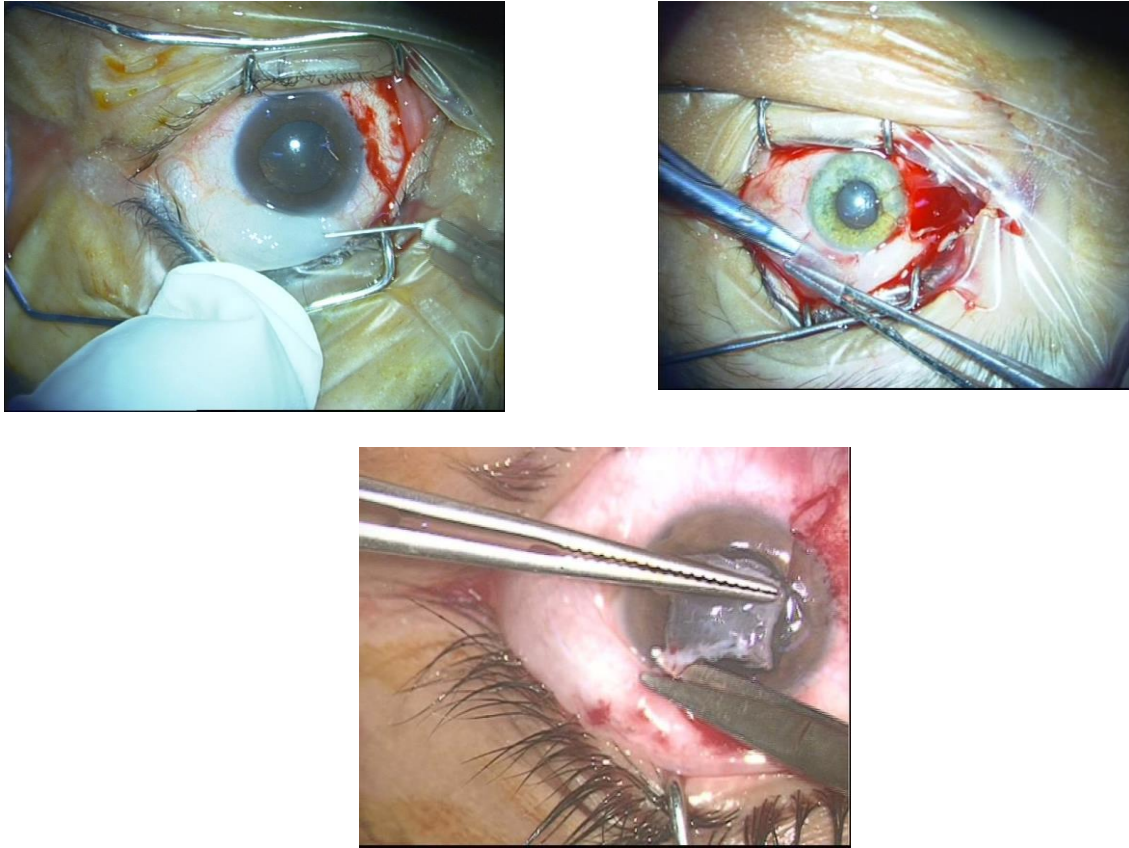


Figure (2): Graft preparation.

- The graft was placed on the bare sclera in such a way so as to maintain the original orientation of the juxtalimbal border towards the cornea (Figure-3).

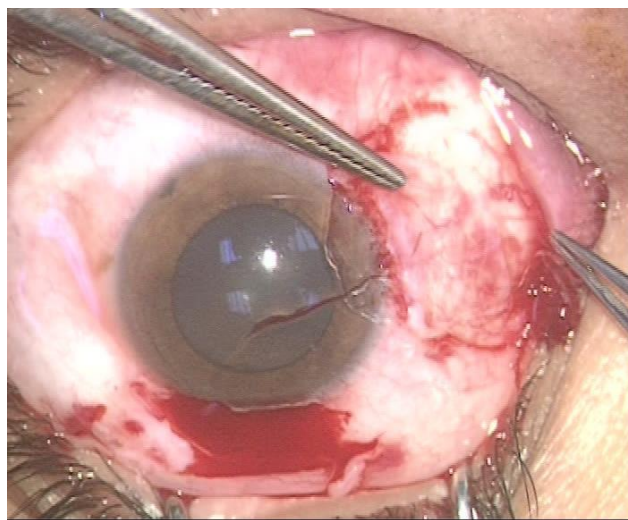


Figure (3): Graft placement at the bare area.

- Small central hemorrhages was tamponaded with direct compression.
- The free graft was held in position for 8-10 minutes by application of gentle pressure over it.
- The eye speculum was removed carefully.
- The eye was bandaged for 24 hours.
- The duration of the surgery and intraoperative details were documented for each case.

6. Post-Operative Care:

- The patients were advised not to rub the eye.
- Medications: topical Antibiotic & Steroid combination was administered after 24 hours in the form of eye drops 4 times a day and ointment at bed time for 2 weeks and were tapered over the next 4 weeks.
- The patients were followed up post operatively after 24 hours, 3 days, 1 week, 3 weeks, 6 weeks, 3 months and 6 months.

- All data were collected and subjected to statistical analysis using SPSS (Statistical Package for Social Science) version 20 programs.

Results

The following observations were made. Of the patients 11 (42.3%) were males and 15 (57.7%) were females. Regarding the patients occupation, 23 (88.5%) of them were practicing outdoor occupations and the remaining 3 (11.5%) were practicing indoor occupations.

The patients were arranged in age groups varying from 30 years to 70 years. The mean age of the study population was 50.07±8.05 years (range, 32-65 years). Maximum number of patients (42.3%) were in the age group of 41 to 50 years, followed by (38.5%) in the age group of 51 to 60 years (Table-1).

Table (1): Demographic characteristics of the studied cases:

Variable	Mean ±SD	Range
Age	50.07±8.05	32-65
	Frequency	Percentage %
Age groups:		
30-40	3	11.5
41-50	11	42.3
51-60	10	38.5
61-70	2	7.7
Sex:		
Males	11	42.3
Females	15	57.7
Occupation:		
Outdoor	23	88.5
Indoor	3	11.5

Of the thirty eyes, pterygia located nasally in all cases (100%). The pterygia were primary pterygia in 26 eyes (86.7%) and recurrent in 4 eyes (13.3%). Of the 26 cases, the pterygia were present in the right eye in 8 cases (30.77%), in the left eye in 14 cases (53.85%) and in both eyes in 4 cases (15.38%). The pterygia were present in the right eye in 12 eyes (40%) and in

the left eye in (60%). The pterygia were Grade T3 (Underlying episcleral vessels totally obscured) in 12 eyes (40%) Grade T2 (Underlying episcleral vessels partially obscured) in (60%) but no cases were Grade T1 (Underlying episcleral vessels clearly distinguished) (0%) (Table -2).

Table (2): Pterygium among studied group:

Variable	Frequency	Percentage %
Primary	26	86.7
Recurrent	4	13.3
Nasal	30	100
Temporal	0	0
OD	12	40
OS	18	60
Grade		
T1	0	0
T2	18	60
T3	12	40

The average operative time was 23.43±2.47 minutes (range 19-30). No significant intra-operative complications were noted except for intraoperative haemorrhage in one patient (3.3%).

All patients had postoperative discomfort in the form of:

- 1- Pain which lasted for 1.1±0.30 weeks (range1-2).
- 2- Foreign body sensation lasted for 1.53±0.62 weeks (range1-3).
- 3- Lacrimation lasted for 1.70±0.75 weeks (range1-4).
- 4- Redness which lasted for 2.73±0.64 weeks (range2-4).Table (3).

Table (3): Postoperative symptoms:

Variable	Mean ±SD	Range
Pain (in weeks)	1.1±0.30	1-2
F.B sensation (in weeks)	1.53±0.62	1-3
Lacrimation (in weeks)	1.70±0.75	1-4
Redness (in weeks)	2.73±0.64	2-4

The donor site reepithelialized completely within ten days after surgery; its epithelial healing was not associated with shrinkage or malformation in any of the eyes.

Graft oedema occurred in all cases (n=29) and lasted3.83±1.64 days (range 3-7). Graft oedema resolved within 3 days in 23 cases (79.3%) and

resolved within 7 days in the remaining 6 cases (20.7%).

Subgraft haemorrhage was reported in 2 cases (6.6%), one case the graft was rejected in the second day postoperative and the other case the subgraft haemorrhage lasted for 4 weeks and in which the graft was stable (Figure-4)

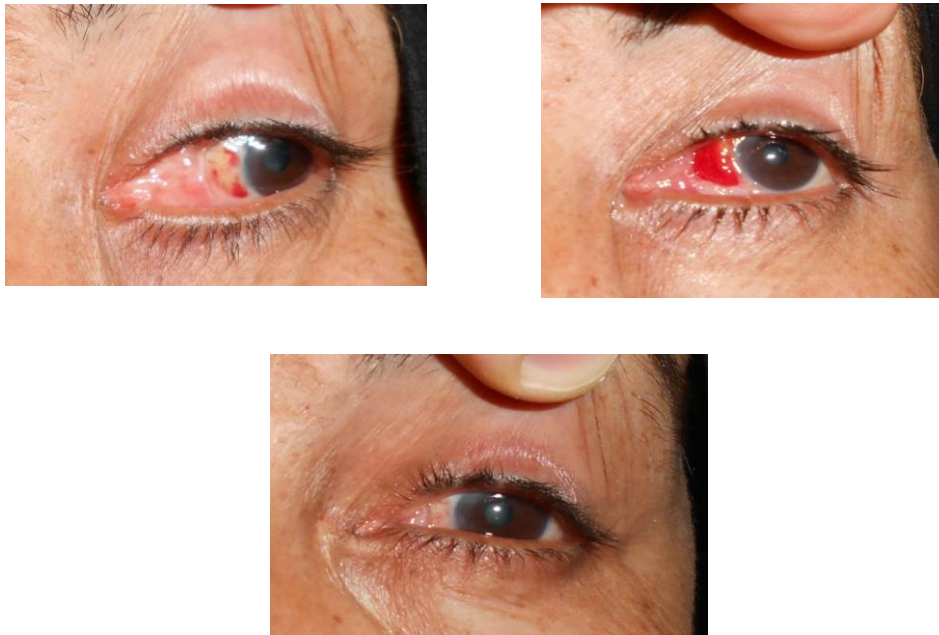
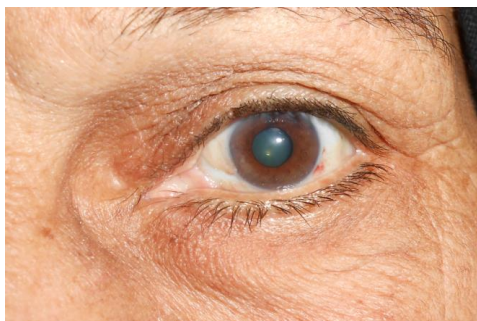


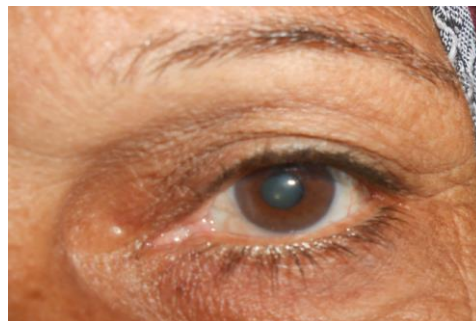
Figure-4: Subgraft haemorrhage (A) 4 days Postoperative (B) 20 days postoperative(C) one month postoperative

The grafts were stable in 27 cases (90%), rejected in one case (3.3%), retracted in one case (3.3%) (Figure-5) and retracted with partial displacement in one case (3.3%). In cases with

graft retraction no active treatment was instituted and the exposed area epithelialized adequately on follow up without compromising surgical or cosmetic results.



A



B

Figure (5):Graft retraction (A) One month postoperative (B) six month postoperative

After 6 months follow up, neither symblepharon formation nor motility restriction or pyogenic granuloma were reported. Only one

case of recurrence was reported by the 3rd month follow up and was the same case of rejected flap Figure (6), Figure (7).

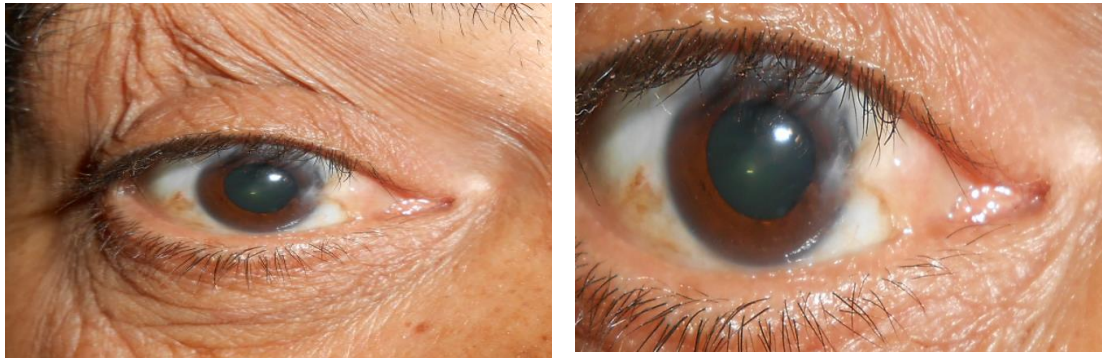


Figure 6: Recurrent pterygium by the 3rd month.

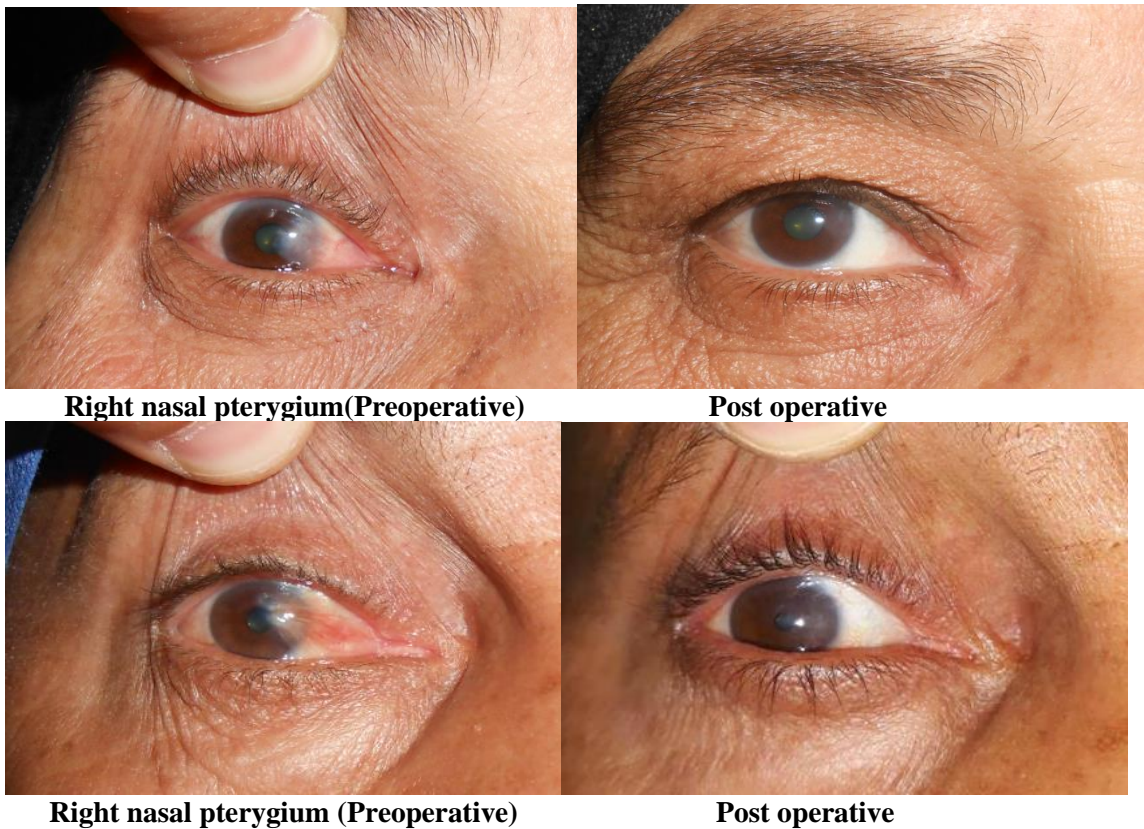


Figure (7): Cases with no recurrence, Preoperative and Postoperative photos.

Discussion

Pterygium is one of the common ocular surface diseases. Conservative treatment, in the form of NSAID and lubricating drops, is symptomatic. The main method of treating pterygium is by surgical excision. The aim of pterygium surgery is to excise the pterygium and prevent its recurrence. High recurrence rate after successful excision remains a challenge and is the single most common cause of failed pterygium surgery.^[6]

Bare sclera excision is no more used nowadays as it has an unacceptably high recurrence rate ranging from 24% to as high as 89% and has become obsolete.^[7]

Postoperative beta irradiation to the bare sclera has been in use for decades and led to reduction in recurrence associated with bare sclera technique. However complications of beta irradiation limit its use. Documented compli-

cations of radiotherapy include conjunctival inflammation, corneal opacities, scleritis, cataract, uveitis, corneal/scleral thinning, globe perforation, and endophthalmitis.^[8]

Like beta irradiation, the use of perioperative MMC either alone or in combination with surgical grafting is associated with satisfactory reduction in recurrence but serious sight threatening complications such as scleral melting leading to perforation, uveitis, infectious scleritis, and endophthalmitis could be present long after surgery.^[6]

The ideal procedure is which have minimum recurrence and complications. The conjunctival autografting described by Kenyon et al probably closest to this goal. Kenyon in 1985 used superotemporal bulbar conjunctival auto graft from same eye in 57 eyes and found excellent results with very low recurrence rate (5.3%).^[9]

A prospective randomized controlled trial comparing Limbal-conjunctival vs conjunctival autograft transplant for recurrent pterygia suggested Limbal-conjunctival transplant to be safe and more effective than free conjunctival transplant in preventing recurrence after excision of recurrent pterygia. Thus, it could be a favoured option for managing advanced recurrent pterygia in young high-risk patients.^[2]

Amniotic membrane graft (AMG) has been shown in many studies to have a higher rate of recurrence compared to both conjunctival and limbal autografting. Despite these findings, there is still a role for this technique in the treatment of pterygia.^[10]

The most common method of autograft fixation is suturing, with the drawbacks of prolonged

operating time, postoperative discomfort, suture abscesses, buttonholes, and granuloma formation which usually requires a second operation for removal.^[3]

Koranyi et al, in a randomized clinical trial, reported that fibrin glue (TISSEEL) could be used to attach the conjunctival autograft instead of sutures.^[11]

The use of fibrin glue result into shorter operative time, less postoperative discomfort and inflammation, less risk of wound infection contrary to sutures.^[4]

The glue is not only costly but also Human infection of parvovirus B19 (HPV B19) has been reported after use of fibrin glue products from different manufacturers . Furthermore, anaphylactic reaction has been reported after the use of (TISSEEL) fibrin sealant which was due to bovine protein aprotinin.^[12]

In the present study we used the technique of sutureless glueless LCAG (Limbal Conjunctival Autograft) in pterygium surgery in which grafts were fixed using patients' own blood clot as tissue adhesive which oozed in the bare sclera after pterygium excision.

After 6 months follow up no complications such as symblepharon formation, motility restriction and pyogenic granuloma were recorded. Recurrence occurred only in one case (3.3%) and it was the same case of rejected flap. This case was on anti-coagulant medications after cardiac surgery, and inspite of stoppage of those medications prior to surgery, intraoperative haemorrhage, subgraft haematoma occurred and the graft rejected by the second day postoperatively.

Table (9): Comparing recurrence rates among different studies on suture less glueless conjunctival auto graft.

Study	Eyes	Follow-Up period (Monthes)	Recurrence (%)
Sharma et al[5]	80	3	1(1.25)
Bhargava et al[13]	52	12	1(1.92)
Dasgupta et al[14]	60	6	1(1.67)
Wit et al[15]	15	9	0(0)
Rangu et al[16]	20	6	0(0)
Nanda et al[17]	50	6	0(0)
Singh et al[18]	10	12	1(10)
Foroutan et al[19]	15	35	2(13.33)
Malik et al[3]	40	12	1(2.5)
Rathi et al[20]	50	6	1(2)
Our study	30	6	1(3.3)

Conjunctival auto grafting without sutures and glue is today recognized as the procedure of choice for pterygium surgery, in terms of its efficacy and safety, and represents the 'gold standard' to which other procedures may be compared.

Conclusion

Sutureless and glueless conjunctival auto graft following pterygium excision is safe, easy, effective and economic technique in both primary and recurrent pterygium surgery.

References

- 1- Fuest, M., J.S. Mehta, and M.T. Coroneo, New treatment options for pterygium. 2017, Taylor & Francis.
- 2- Al Fayez, M.F., Limbal-conjunctival vs conjunctival autograft transplant for recurrent pterygia: a prospective randomized controlled trial. *JAMA ophthalmology*, 2013. 131(1): p. 11-16.
- 3- Malik, K., et al., Efficacy of sutureless and glue free limbal conjunctival autograft for primary pterygium surgery. *Nepalese Journal of Ophthalmology*, 2012. 4(2): p. 230-235.
- 4- Panda, A., et al., Fibrin glue in ophthalmology. *Indian journal of ophthalmology*, 2009. 57(5): p. 371.
- 5- Sharma, A., H. Raj, and A.V. Raina, Suture less and glue free limbal conjunctiva autografting following pterygium excision. *JK Science*, 2015. 17(2): p. 68-72.
- 6- Mohammed, I., Treatment of pterygium. *Annals of African Medicine*, 2011. 10(3): p. 197.
- 7- Huda, M.M.U. and S.A. Khaleque, Comparison between Sutureless and Glue Free versus Sutured Limbal Conjunctival Autograft in Primary Pterygium Surgery. *Medicine Today*, 2019. 31(1): p. 1-8.
- 8- Jürgenliemk-Schulz, I.M., et al., Prevention of pterygium recurrence by postoperative single-dose β -irradiation: a prospective randomized clinical double-blind trial. *International Journal of Radiation Oncology* Biology* Physics*, 2004. 59(4): p. 1138-1147.
- 9- Kenyon, K.R., M.D. Wagoner, and M.E. Hettinger, Conjunctival autograft transplantation for advanced and recurrent pterygium. *Ophthalmology*, 1985. 92(11): p. 1461-1470.
- 10- Li, M., et al., Comparison of conjunctival autograft transplantation and amniotic membrane transplantation for pterygium: a meta-analysis. *Graefe's Archive for Clinical and Experimental Ophthalmology*, 2012. 250(3): p. 375-381.
- 11- Koranyi, G., S. Seregard, and E. Kopp, Cut and paste: a no suture, small incision approach to pterygium surgery. *British journal of ophthalmology*, 2004. 88(7): p. 911-914.

- 12- Kurian, A., I. Reghunadhan, and K. Nair, Autologous blood versus fibrin glue for conjunctival autograft adherence in sutureless pterygium surgery: a randomised controlled trial. *British Journal of Ophthalmology*, 2015. 99(4): p. 464-470.
- 13- Bhargava, P., A. Kochar, and R. Joshi, A Novel Technique—Pterygium Excision Followed by Sutureless and Gluefree Conjunctival Autografting. *Acta Medica*, 2015. 2: p. 06.
- 14- Dasgupta, S., V. Vats, and S.K. Mittal, Pterygium excision with suture-free, glue-free conjunctival autograft (SFGF-CAG): Experience of a tertiary care hospital of the Northern India. *Journal of Clinical Ophthalmology and Research*, 2016. 4(3): p. 143.
- 15- de Wit, D., et al., Sutureless and glue-free conjunctival autograft in pterygium surgery: a case series. *Eye*, 2010. 24(9): p. 1474.
- 16- Rangu, R., A. Wanjari, and N. Akhade, Study of Sutureless and Glue Free Conjunctival Autograft. *International Journal of Recent Trends in Science And Technology*, 2014. 10: p. 480-82.
- 17- Nanda, L. and M.W. Shivakumar, Autologous blood as tissue adhesive for conjunctival Autograft in primary nasal pterygium surgery. 2013.
- 18- Singh, P.K., et al., Conjunctival autografting without fibrin glue or sutures for pterygium surgery. *Cornea*, 2013. 32(1): p. 104-107.
- 19- Foroutan, A., et al., Efficacy of autologous fibrin glue for primary pterygium surgery with conjunctival autograft. *Iranian Journal of ophthalmology*, 2011. 23(1): p. 39.
- 20- Rathi, G., et al., Pterygium surgery: Suture less glue less conjunctival auto grafting. *Int J Res Med*, 2015. 4(1): p. 125-128.