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Research Article,

Outcome Of The Use Of Autologous Blood Serum, Fibrin Glue And Vicryl Suture In Conjunctival Autograft Transplant Following Pterygium Surgery

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Abstract:

Background: Pterygium is a common ophthalmological problem in India. Excision of pterygium with conjunctival autograft is the main line of treatment. Many modifications of surgical techniques have been tried like conjunctival autografting with fibrin glue, sutures and autologous serum. All these modalities have their pros and cons. We compared these techniques for conjunctival autografting following pterygium surgery.

Methods: A randomized interventional study was performed on 60 eyes with primary nasal pterygium. After pterygium excision, the bare sclera was covered with a conjunctival autograft, which was fixed using autologous blood serum (in Group A, n=20), fibrin glue (in Group B, n=20) and vicryl suture (8-0) (in Group C, n=20). The patients were examined on postoperative Day 1, 1 week, 1month, 3 month and 6 month. The main outcome measures were operative time, autograft stability, postoperative discomfort, autograft thicknes, pterygium recurrence and granuloma formation.

Results: The mean operative time was significantly shorter in group A(23.60 min) followed by Group B (25.20 min) and Group C(28.15 min)(p-value <0.0001).Postoperative discomfort measured on visual analogue scale was minimal in fibrin group (p-value=0.0008) and maximum in suture group. Graft displacement was found in 2(10%) patient in autologous blood group (p value=0.349) while Graft oedema, granuloma & recurrence was noted in suture group only (p value=0.362).

Conclusions: The conjunctival autografting with fibrin glue proved to be better method than autologous serum and suture, as it had very less postoperative discomfort, no recurrence, minimal edema and less graft displacement.

Key Words: conjunctival autograft, autologous blood serum, fibrin glue, limbal stem cells.

Introduction:

Pterygium in the conjunctiva is characterized by elastotic degeneration of collagen fibres (actinic elastosis) and fibrovascular proliferation[1]. It is a common ophthalmological problem in India. Cosmetic and visual problems including diplopia due to limitation in movement are the main indications of surgery[2]. Many techniques have been tried for surgical excision but recurrence remains a big problem till now. Kenyon et al[3] introduced the concept of conjunctival autografting in 1985 that reduces recurrences by 5- 7% and failure rate

by16%. A Cochrane review[4] found conjunctival autograft surgery was less likely to have recurrence of the pterygium at 6 months compared to amniotic membrane transplant. Until recently this conjunctival autograft was anchored to the bare scleral bed with either sutures such as Vicryl or by means of tissue glues.

Currently, conjunctival autograft transplant with autologous serum gaining popularity due to its low recurrence rate and high patient's comfort[5, 6.In] this technique graft adhered to the sclera bed due to fibrinous action of the blood oozing from vessels on bare scleral bed. This study intended to compare the outcome of the aforementioned ocular surface transplantation techniques where conjunctival autografts are secured to the bare sclera bed with the help of 8-0 Vicryl sutures, fibrin glue and autologous serum in terms of surgical time, intra and postoperative complications, severity of postoperative inflammation, graft uptake and recurrence.

Methods:

It was a prospective comparative study conducted on 60 eyes having pterygium of 60 patients aged 20-60 years, who presented to the department of ophthalmology, tertiary care hospital in rural settings from october 2017 to june 2019.inclusion criteria were patients with primary pterygium, pterygium covering more than 2 mm of cornea, ucva less than 6/12 and patients who want cosmetic correction. Patients with pseudopterygium, ocular surface disorder and infection, temporal, recurrent & atrophic pterygium and patient on anticoagulant were excluded from the study. After detailed ocular and systemic history, a thorough ocular examination including visual acuity, refraction, keratometry, ocular movements, and slit-lamp examination was done. 60 patients were divided into three groups, 20 patients in each group. The autograft was fixed at the place of excised pterygium either with – autologous serum, fibrin glue or suture (8-0 vicryl).

Group-a- autologous blood serum group

Group-b-fibrin glue group. (Reliseal fibrin glue was used in pterygium surgery for the fibrin glue group patient).

Group-c- suture group

We used reliseal fibrin glue for our study. Reliseal fibrin glue (reliance, India) is a two-component fibrin sealer, which when combined have been haemostatic, adhesive, sealant and wound-support properties[3].

Surgical Procedure

Common steps in all three types:

Under local anaesthesia (peribulbar block), body of pterygium was dissected 3 to 4 mm from the limbus by blunt dissection followed by careful beaver blade excision of corneal remnants. The bare sclera on the nasal side was measured and a free thin tenon free conjunctival autograft with limbal stem cell of same size (as that of bare sclera) was prepared from supero temporal quadrant. Proper orientation of graft was maintained with epithelial side up and limbal edge toward limbus, while transferring it to recipient site.

Following steps are:

In **group a** (autologous serum group), haemostasis was allowed to occur spontaneously without use of cautery. Graft was positioned without tension and direct compression was applied using non-toothed forceps for 8-10 minutes to achieve haemostasis and for proper fixation of graft.

In **group b** (fibrin glue group), a drop of sealer protein solution (human fibrinogen concentrate in protein) and that of thrombin solution (thrombin in water for injection) which constitutes the fibrin glue (commercially available) was applied to the bare sclera. The prepared conjunctival autograft was then slided onto the glued sclera in proper anatomical orientation and 3 min interval was given to allow the graft to adhere.

In **group c** (suture group), graft was secured to recipient site of sclera with 4- 5 interrupted absorbable (vicryl 8-0) sutures. Sutures were removed later on postoperative day 7 during followup. Combination of topical moxifloxacin (0.5%) and dexamethasone (1%) drops were applied four times per day, and cmc (0.5%) drops were applied four times per day.

Follow up postoperative day 1, 1 week, 1month, 3 month and 6 month. An assesment was done in follow-up visit for: post operative degree of discomfort, graft stability, graft edema, granuloma formation & recurrence. Post operative degree of discomfort was graded on the basis of vas (visual analogue scale) score into nothing, mild, moderate and severe. The visual analogue scale or visual analog scale (vas) is a psychometric subjective response scale based on questionnaires. It is a measurement instrument for characteristics or attitudes that cannot be directly measured.

The analysis was done by using the spss +24.0. The results were calculated in terms of proportions, mean and percentage. Association between the

subjects was calculated using Pearson's chi-square test.

Results:

A total of 60 patient were enrolled in this study, out of this 36 were females (60%) and 24 were male (40%). These patients were randomly divided into three groups. (Table 1)

Group	Total No of cases	Males (%)	Females (%)
A:Autologous blood	20	12(60%)	8(40%)
B: Fibrin glue	20	4(20%)	16(80%)
C : Suture	20	8(40%)	12(60%)
Total	60	24(40%)	36(60%)

Table 1: Distribution of cases into groups

Mean age in fibrin glue group was found to be 38.05 years and in suture group it was 38.00years and in autologous blood it was 37.80 years (p value 0.998). Most of the patient in this study were outdoor/field workers (70%) followed by housewives, students, professionals (p value 0.017). Pre – op complaints were foreign body sensation (most common), mass in the eye, watering, redness and diminution of vision.

Mean duration of surgery in autologous blood group, fibrin group, suture group was 23.60 minutes(22.0-28.0 minutes), 25.20 minutes(23.0-29.0 minutes),28.15 minutes(21.0-31.0 minutes) respectively (p value <0.0001). Intra-operative complications encountered mentiones in Table 2.

	Group A		Group B		Group C	
	Day 1	Post – op 1 week	Day 1	Post – op 1 week	Day 1	Post – op 1 week
Nothing	2 (10%)	18(90%)	14(70%)	20(100%)	2(10%)	5(25%)
Mild	11(55%)	2(10%)	4(20%)	0(0%)	3(15%)	12(60%)
Moderate	4(20%)	0(0%)	2(10%)	0(0%)	11(55%)	3(15%)
Severe	3(15%)	0(0%)	0(0%)	0(0%)	4(20%)	0(0%)

Table 2: Intra-operative complication

Table 2: Intra-operative complication

Most patients in all the groups complained of post operative discomfort in day 1(p value 0.008) while after one week, most of the patients in suture group had discomfort while only 2 patients in group A had mild discomfort and none in group B(p value 0.001)(Table 3).

Complications	Group A	Group B	Group C
Bleeding	19(100 %)	18(95%)	18(95%)
Graft button hole	0(0%)	1(5%)	1(5%)
Under size graft	1(5%)	0(0%)	1(5%)
Oversize graft	0(0%)	1(5%)	0(0%)
Total	20(100 %)	20(100 %)	20(100 %)

Table 3: Post-operative discomfort (daywise)

At 1 month and 3 months follow up, in Suture group there were 2 patients (10%) who complained of mild discomfort. At the end of 6 months there was 1 patient (5%) in suture group who complained of mild discomfort due to recurrence while none of the patients among group A & B had any discomfort at 1, 3 & 6 months follow-up.

Postoperative graft related complications and recurrence:

1). **Graft stability**: There were graft displacement reported in one patient (5%) in fibrin glue and 2(10%) patient in autologous blood group and none in suture group. (P value =0.349)

2). **Graft edema**: Graft edema was noted in 1(5%) patient in suture group only (p value = 0.362).

3).**Recurrence**: Recurrence was seen in 1(5 %) case in suture group only after 3 month of follow up (p value = 0.362).

4). **Suture granuloma:** 1 case (5%) of suture granuloma was reported in group C after the 1 week of postoperative follow up. (P value = 0.362).

Discussion:

In present study, female were more (60%) commonly affected than males similar to many studies [7-11]. Authors explained that women were more exposed to outdoor works in rural areas and another explanation is that females in our society are more concerned for cosmetic appearance therefore they consult more frequently. But this finding was contradictory to a study which reported male preponderance (60%) [12-15]. Most of patient in present study were from middle Age group (Mean age: in autologous blood group: 37.80 years, in fibrin glue group: 38.05 years, and in suture group: 38.00 years.) similar to a study in which maximum incidence of pterygium was found in age group of 30-40 years[12, 16]. But Mc Carty CA et al reported that prevalence of pterygium increased with age, being 2.83%in 40-60 years of age and 6.4% after 80 years of age[17]. We found that most of the patients were field worker/ labourers (70%).Many studies reported that pterygium prevalence was 4 to 11

times commoner in persons working outdoors, exposed to sun and dust[18,19].“Stanford SJ Eye diseases in hot climates’’[20] and many other studies[12, 21] observed that pterygium was more common in rural areas than urban. Mean duration of surgery in autologous blood group, fibrin glue group and in suture group was 23.60 ± 1.54 minutes, 25.20 ± 2.98 minute and 28.15± 1.27 minutes respectively. In similar study by S.A.M. Elwan et al[22] mean operating time was 24 minutes in autologous blood group and 28.64 minutes in suture group which was comparable to our result. In autologous blood technique of graft fixation by D de Wit et al[10], mean operating time was 14 minutes. This time is less in comparison to our study (23.60±1.54 minutes) and this difference was due to surgical skill of different surgeons. In present study, in immediate postoperative follow up (day 1) severe discomfort was noted in 4 patients (20%) in suture group and 3 patients (15%) in autologous blood group and none in fibrin glue group and at the end of 1 week revealed that there were 3 patients (15%) in suture group who complained of moderate discomfort. Similarly, other studies too reported greater mean score of postoperative pain (75) in suture group on day 1 in immediate postoperative period .[10,22,23] Recurrence is a common complication of pterygium surgery and has been reported in 2-39% cases in sutured graft technique[24,25], we have reported 5% recurrence in suture group. In Study by S.A.M. Elwan recurrence in suture group was 8% and in autologous blood group was 6%.[22]We have not observed any recurrence in other two groups similar to other studies[10,14,26].However, Singh PK et al[27] found recurrence rate of 10% in both fibrin glue and autologous blood group. There were graft displacement reported in one patient (5%) in fibrin glue and 2(10%) patient in autologous blood group which is consistent with Nisha Dulani ET al[28] who reported graft displacement in only 3.39% of the patient. It is also consistent with other studies.[13, 15]

Graft edema was found in 5% in suture group in our study. In study of Celeva Markovaska et al[29] graft edema was present in 22.5% of cases in suture group whereas Bhargava et al[15] and Rangu et al[14] reported graft edema in 7.69% and 10% cases respectively. As in present study sample size was less and graft edema is also dependent on intraoperative manipulation that vary from surgeon to surgeon so it is not conclusive and further clarification is needed. We have found granuloma in 5% in suture group similar to a study conducted by S.A.M. Elwan[22] who reported conjunctival granuloma in 3% of cases in suture group.

Conclusion:

Suture related complications remains draw back in Suture group and graft displacement remains a problem with autologous blood group than fibrin glue group. But overall incidence of these complications is very less. So it is clear from above points that conjunctival autografting with fibrin glue proved to be better alternative of conjunctival autografting than with suture and autologous blood , as it had very less postoperative discomfort, no recurrence, minimal edema, less graft displacement and early rehabilitation. Chances of graft displacement can be reduced if we take thin graft, and properly explain the patients not to rub their eyes in immediate postoperative period.

References:

[1.] Klintworth, G; Cummings, T. et al: The eye and ocular adnexa". In Stacey, Mills (Ed.). Sternberg's Diagnostic Surgical Pathology (5th Ed.). ISBN 978-0-7817-7942-5.

[2.] Kheirkhah A, Adelpour M, Nikdel M, Ghaffari R, Ghassemi H, Hashemi H. Evaluation of conjunctival graft thickness after pterygium surgery by anterior segment optical coherence tomography. Curr Eye Res.2011; 36:782-6.

[3.] Kenyon KR, Wagoner MD Hettinger ME: Conjunctival autograft transplantation for advanced and recurrent pterygium. Ophthalmology 1985; 92(11):1461-70.

[4.] Clearfield E, Muthappan V, Wang X, Kuo IC. Conjunctival autograft for pterygium. *Cochrane Database Syst Rev*. 2016; 2:CD011349.

[5.] Shrivastava S, Patkar P, Ramakrishnan R, Kanhere M, Riaz Z. Comparison of fibrin glue and autologous serum for conjunctival autograft fixation in pterygium. Delta J Ophthalmol 2017;18:133-7

[6.] Minj A, Satapathy J. Conjunctival Autograft using Autologous Serum versus Suturing Technique in Primary Pterygium: A Randomised, Prospective, Comparative Study.Journal of medical science and research.2018; Vol.6 Issue.4:1219-1224.

[7.] Hilgers, J.H.Ch. Pterygium: Its Incidence, Heredity and Etiology .American Journal of

Ophthalmology.1960; Volume 50, Issue 4:635-644.

[8.] Lu P, Chen X, Kang Y, Ke L, Wei X, Zhang W. Pterygium in Tibetans: a population-based study in China. Clin Experiment Ophthalmol. 2007; 35(9):828–33.

[9.] Sharma A, Raj H, Raina AV. Suture Less and Glue Free Limbal Conjunctival Autografting following Pterygium Excision. JK Science. 2015 April; 17(2): 68-72.

[10.] De Wit D, Athanasiadis I, Sharma A, Moore J. Sutureless and gluefree conjunctival autograft in pterygium surgery: a case series. Eye. 2010; 9: 1474-7.

[11.] Dasgupta S, Vats V, Mittal SK. Pterygium excision with suture-free, glue-free conjunctival autograft (SFGF-CAG): Experience of a tertiary care hospital of the Northern India. Indian J Clin Ophthalmol Res 2016;4: 143-8.

[12.] Rohatgi S. Pterygium: an epidemological study in India. International J. of Healthcare & Biomedical Research.2013; Volume 1, Issue 4:297-301

[13.] Malik K.P.S., Goel R., Gupta S.K., Kamal S., Malik V.K., Singh S. Efficacy of sutureless and glue free limbal conjunctival autograft for primary pterygium surgery. Nepal J Ophthalmol. 2012;4(8):230–235.

[14.] Rangu RV, Wanjari A, Akhade N. Study of sutureless and glue-free conjunctival autograft. International Journal of Recent Trends in Science and Technology.2014; 10:480-82.

[15.] Bhargava P, Kochar A, Joshi R. A novel technique – Pterygium excision followed by sutureless glueless conjunctival autografting. Acta Medica Scientia. 2015; 02(06).

[16.] Parthasarthy & Gupta V.C."Prevalence of pterygium in rural India" Orient.Arch.ophthal.1967; 5:139-147.

[17.] McCarty C.A, Fu C.L, Taylor H.R. "epidemiology of pterygium in Victoria, Australia" Brit.J.ophthalmol.2000; 84:289-292.

[18.] Mackenzie F.D, Hirst L.W, Battistutta D."Risk analysis in the development of pterygia". Ophthalmol.1992; 99:1056-1061.

[19.] Luthra R , Nemesure B , Wu Sheng-Yong , Xie S , Leske M. Frequency and Risk Factors for Pterygium in the Barbados Eye Study. Archives of ophthalmology. 2002; 119:1827-32.

[20.] Stanford-Smith J. Eye diseases in hot climates. India.Elsevier.2003; 4:1-22.

[21.] Wu K, He M, Xu J, Li S. Pterygium in aged population in Doumen County, China. *Yan Ke Xue Bao*.2002; 18(3):181–4.

[22.] Elwan SAM. Comparison between sutureless and glue-free versus sutured limbal conjunctival autograft in primary pterygium surgery. Saudi Journal of Ophthalmology. 2014; 28:292-8.

[23.] Peeush P, Sarkar S. A Comparative Study of Pterygium Excision Using Autologous Blood versus Sutures; a Study from Remote Eastern Bihar, India. Ophthalmology Research: An International Journal. 2015; 3 (1):28-32.

[24.] Sharma AK, Wali V, Pandita A. Corneo conjunctival auto grafting in pterygium surgery. JK Science.2004; 6(3):149-152.

[25.] De la Hoz F, Montero JA, Alio JL, et al. Sliding and free grafts seem to be equally effective but direct conjunctival closure alone is not as effective as either the sliding or free graft. Br J Ophthalmol.2008; 92:175-188.

[26.] Shaw J, Hirst LW, Mitra S, Moore JE. A New Approach Emerges for Pterygium Surgery. EyeNet Magazine. Clinical update. Cornea. American Academy of Ophthalmology. Feb 2012: 27-29.

[27.] Singh PK, Singh S, Vyas C, Singh M. Conjunctival autografting without fibrin glue or sutures for pterygium surgery. Cornea 2013; 32:104-7.

[28.] Nisha Dulani and Harish Dulani, Int J Pharm Biomed Res.2014;5(3):58-60.

[29.] Celeva Markovska V, StankovicBabic G, Zdravkovska Jankuloska M Et al. Comparative Study of Pterygium Surgery. Sec. Biol. Med. Sci.2011:273-287.