

# Comparative Study of Fibrin Glue, Suturing and Sutureless / Glue Free Limbal Conjunctival Autograft for Primary Pterygium Surgery Attending a Regional Referral Centre in Eastern India

Dattatreya Banerjee<sup>1</sup>, Parikshit Nandi<sup>2</sup>, Poulami Nandi<sup>3</sup>

<sup>1</sup>Clinical Tutor, Department of Ophthalmology, Burdwan Medical College, Purba, Bardhaman, India

<sup>2</sup>Associate Professor, Department of Ophthalmology, Gouri Devi Institute of Medical Sciences, Purba, Bardhaman, India

<sup>3</sup>Associate Professor, Department Of Microbiology, Nil Ratan Sircar Medical College, Kolkata, India

Received: January 2021

Accepted: February 2021

## ABSTRACT

**Background:** There are different modalities of treatment available for pterygium. We compared three different surgical options for treatment of pterygium with conjunctival autograft (CAG) using sutures, tissue glue, and autologous in situ blood coagulum in terms of cost effectiveness, simpler technique with lesser incidence of complications. **Methods:** A single institutional prospective randomized study was carried out in a tertiary eye hospital in Eastern India. A total of 150 patients (163 eyes considering the bilaterality) with pterygium were randomly included (50 cases for each procedure) under 3 procedures to compare. The patients were followed up for 06 months. Duration of surgery, complication, post-operative discomfort and recurrence of pterygium are considered to evaluate these procedures. **Results:** In the suture group, the mean operation time was maximum when compared to rest two procedure. The incidence of complications was noted. Recurrence after 6months of follow up were One case each in group where fibrin glue and suturing was applied. and only 2 cases of recurrence was noted in sutureless/glue free limbal conjunctival autograft. **Conclusion:** Fibrin glue application instead of sutures in pterygium surgery resulted in shorter surgical time, less post-operative discomfort and lower recurrence.

**Keywords:** Autograft, postoperative comparison, fibrin glue, suture.

## INTRODUCTION

From the Greek, pterygos, “little wing”, pterygium is a wing-shaped, vascular, fleshy growth that involves conjunctiva and can spread to the corneal limbus and beyond. Worldwide prevalence of pterygium varies from 1 to 25 percent, depending on the population studied.<sup>[1-6]</sup> More commonly in tropical regions pterygium occurs, although the exact etiology is yet to look for.<sup>[7-9]</sup> Chronic sun exposure specifically to ultraviolet (UV) light,<sup>[10-13]</sup> may partly explain this. In many cases pterygium can remain as cosmetic problem. But foreign body sensation, itching, burning, tearing, blurred vision are related to active inflammation and diplopia, dimness of vision can also be experienced with advanced pterygium. There is a lack of consensus in the ophthalmological community about the optimal medical and surgical management of pterygia. Aggressive surgical approach is appropriate when behaviour of pterygium is aggressive. Intra operatively amniotic membrane grafting, post-operative  $\beta$  irradiation with Sr-90, intra operative and post-operative application

of 5 Fluorouracil and Mitomycin can prevent recurrence though there remains a chance of serious post-operative complications and transmission of infection. (Xiu Wang,2017).<sup>[14]</sup> Concept of conjunctival autografting in 1985 was introduced by Kenyon. In this study, The surgical time, post-operative discomfort, graft stability, recurrence rate and complications were compared by using fibrin glue, suturing and sutureless / glue free limbal conjunctival autograft for primary pterygium surgery. The aim of this study is to evaluate and compare sutureless and glue free technique with suturing or fibrin glue usage in fixation of conjunctival autograft in the management of primary pterygium in terms of cost effectiveness, post-operative complication and easier technique to perform and the functional outcome of all the procedures.

## MATERIALS AND METHODS

This study was a prospective, single institutional, interventional clinical study to compare all three methods (sutureless and glue free technique, with suturing or fibrin glue usage in fixation of conjunctival autograft in the management of primary pterygium) of pterygium surgery in terms of the outcomes and post-operative complications. After obtaining the approval from Institutional ethical committee, we selected 150 patients, considering our

### Name & Address of Corresponding Author

Dr. Poulami Nandi  
Associate Professor,  
Department of Microbiology,  
Nil Ratan Sircar Medical College,  
Kolkata, India  
Email: poulami30@gmail.com

inclusion criterias, who attended the OPD of RIO, Kolkata and had given consent for the study after detailing the purpose of this study and related potential risk of surgical procedures involved. The time span of the study was 18 months (January 2017- June 2018). For 3 types of procedure, we included 50 patients randomly in each group without any control group (Group I for Conjunctival autograft with fibrin glue, Group II for Conjunctival autograft with sutures and Group III for sutureless/gluefree conjunctival autograft). Inclusion criteria were a) Patients aged above 18 years of either sex, b) Unilateral or bilateral pterygium, c) Primary pterygium. Patients who were less than 18 years of age, not willing to participate or had recurrent pterygium, known history of trauma or surgery in the eye, or comorbidities which can affect the outcome. Data obtained from the study was analyzed using standard statistical methods. (Chi square test, p-value). Standard "t-test" for statistical analysis and P value  $\leq 0.05$  is considered statistically significant. All the cases were compulsorily done under operating microscope and all surgical procedures were performed by the same surgeon to ensure consistency. Surgery time was noted from first incision until removal of the lid speculum. The fibrin glue was prepared according to the manufacturer's (ReliSeal, Reliance Life Sciences, India) directions. a mixture of 4- 5 ml of 2 % Lignocaine with Adrenaline and 0.5 % Bupivacaine premixed with hyaluronidase in the peribulbar space was injected to achieve local anaesthesia. Pterygium including its head and body were completely removed using the appropriate blade and scissor. Abnormal scar tissue from cornea was polished. Limboconjunctival defect was measured with the help of callipers and 1 mm oversized free limboconjunctival graft was harvested from the superotemporal bulbar conjunctival quadrant of the same eye. Careful dissection was done to remove all tenon tissue and subsequently graft was moved to nasal area and placed over the bare sclera with stromal side down and limbus to limbus orientation. Surgical methods thus far were similar in all three groups with only exception being that thermocauterisation was done to secure bleeding from the bare sclera in Group II and III while haemostasis was achieved by application of a drop of fibrin glue in Group I. In Group I, a drop of sealer protein solution (human fibrinogen concentrate in aprotinin) and that of thrombin solution (thrombin in water for injection) which constitutes the Fibrin glue was applied to the bare sclera area. The prepared conjunctival autograft was slid onto the bare sclera in proper anatomical orientation. Weck cell sponges were used to smoothen the graft and three-minute interval was given to allow the graft to adhere. In Group II patients, 8-0 vicryl sutures were used so that four corners of the graft were anchored to the episclera with single sutures. Three sides were then sutured to the recipient conjunctiva with numerous

sutures sparing the limbal side. The sutures were cut flush to minimize irritation. In Group III, the graft was placed in bare sclera and positioned so as to maintain limbus to limbus orientation. The graft was kept apposed to sclera bed for 10 minutes by applying gentle pressure with fine non toothed forceps. During small bleed from sclera bed, there is always a small ooze of the serum which acts as adhesive. Large bleeds lifts the graft from sclera bed with subsequent complications, and should be tamponade before placing of graft. The eye speculum was removed carefully and the eye patched with a sterile eye pad in all three groups for 24 hours. All operation, all patients were put on steroid (Fluorometholone) eye drops 4 times daily for two weeks followed by twice daily for two weeks and an Antibiotic drop (Moxifloxacin) for two weeks. The first dressing was done on the next day and patients were followed-up after day 1, week 1, and 6 weeks and 6 months. Patients were asked to fill out a questionnaire on postoperative day 1 and during every follow-up examination related to their symptoms and examined clinically (pain, foreign body sensation, lacrimation, hemorrhage, hyperaemia, graft shrinkage/gaping, chemosis, graft dehiscence, recurrence, pyogenic granuloma, blurred vision). Recurrence was evaluated after 1 month and was defined as any fibrovascular growth that passed the corneal limbus by more than 1 mm.

#### **Statistical Analysis:**

Data obtained from the study was analyzed using standard statistical methods. (Chi square test, p-value). Standard "t-test" for statistical analysis and P value  $\leq 0.05$  is considered statistically significant.

## **RESULTS**

A total of 150 patients (163 eyes considering the bilaterality) underwent surgical excision of pterygium and all patients completed the follow-up procedure for at least 6 months. Among 150 patients in this study 137 had unilateral pterygium and 13 had bilateral pterygium. Fibrin glue was used in 52 eyes (whereas sutures were used in 59 eyes (Group II) and sutureless or glue free limbal conjunctival autograft was applied to 52 eyes (Group III). The mean age was 50.93 years (range, 18 years to 72 years) and 82.66% of patients were males when compared to 17.33% females. Out of 163 eyes, only one had temporal pterygium ( $p < 0.5$ ). According to few theories probably incidence of isolated temporal pterygium is rare due to sparseness of subconjunctival connective tissue in this area and may be due to relatively smaller amount of UV rays exposure and other irritant agents impinging in this area due to greater bowing of the outer two-thirds of upper lid. Depending on the size of pterygium, there were 3 groups. Total of 92 eyes (cases) had their pterygium size between 2 and 2.9 mm, 55 cases had

*Banerjee et al; Comparative Study of Fibrin Glue, Suturing and Sutureless | Glue Free Limbal Conjunctival Autograft for Primary Pterygium Surgery*

size between 3 and 3.9mm. Only 16 eyes had their pterygium size > 4mm but less than 5mm. Mean size of pterygium was 2.887 +0.7729 in this study. Mean surgical time was more in Group II(Suture) i.e 46.2 + 1.34 which is reduced to almost half in group I (fibrin glue) and group III (glueless/sutureless). Mean surgical time for Group I (Fibrin glue) is 24.05+0.94 and group III (glueless/sutureless) is 23.27+0.87. With reduction of time, it is noted chances of infection also reduces.

**Post-operative complication/evaluation:** On day 1 almost all the patients suffered from pain which subsided gradually. After statistical analysis it was noticed that there was significant difference of pain among the intervention group in DAY 1st. Foreign body sensation was complained by all the patients but people undergone suturing complained it more than the other group. After applying Chi square test it was found that there was significant difference of foreign body sensation among the intervention groups. Lacrimation was observed among all 3 groups during 24hrs after operation but it was more in group II. There was significant statistical

difference of lacrimation among the intervention group. Haemorrhage was noticed in 11,13 and 17 patients of Gr I, II and III respectively after post-operative period Day 1st it is not statistically insignificant. No statistically significant difference in hyperaemia was found among the intervention groups. Graft shrinkage or gapping was seen in 4 cases in group III after 1wk of post-operative period. Chemosis was observed in 1 cases each in Gr I and Gr III, and 2 cases in Gr II after 24hrs post operative period. Recurrence was noticed after 6 months of post-operative period. One case each in Gr I and II and group III had 2 cases of recurrence. Pyogenic granuloma was seen in 2 cases of Gr III after day 1st. After 1week post-operative period one cases each were seen in Gr II, Gr III. After 1 month and 6 months 1 case in group III continued to have the infective granuloma. Blurred vision was faced by patients in each group upto 1-month post-operative period. But it was gradually subsided. Photophobia was mostly complained by the patients in group II i.e where suture material was used. By the end of 6 months no patients continued to have photophobia.

**Table 1: Number of patients undergoing each procedure, sex distribution, laterality, and location of pterygium**

Fibrin glue (group I)		Suturing (group II)		Sutureless/Glue free limbal conjunctival autograft (group III)		Total	Laterality		Location	
Male	Female	Male	Female	Male	Female		Unilateral	Bilateral	Nasal	Temporal
38	12	45	5	41	09					
50		50		50		150	137	13		
52		59		52		163			127	36

**Table 2: Distribution of cases according to age**

Age in years	Group1	Group2	Group3	Mean age
18-36	6	6	7	50.93
37-54	19	23	20	
55-72	25	20	23	
>72	0	1	0	

**Table 3: Mean size of the pterygium**

Size	2-2.9 MM	3-3.9 MM	4-4.9 MM	Mean
Number	92	55	16	2.887

**Table 4: Types of pterygium and mean surgical time for each procedure**

Types		Management by		
		Fibrin	Suture	Glueless/sutureless
Progressive pterygium	71	23	24	24
Atrophic /degenerative pterygium	92	29	35	28
	Mean.surgical time	24.05+0.94	46.2 + 1.34	23.27+0.87

**Table 5: Post-operative complications**

	Day 1			1Week			6Weeks			6Months		
	I	II	III	I	II	III	I	II	III	I	II	III
Pain	26	49	42	0	21	9	0	4	1	0	0	0
Foreign body sensation	14	48	9	1	27	2	0	5	1	0	1	0
Lacrimation	29	38	20	5	21	17	1	1	1	0	0	0
Hemorrhage	11	13	17	2	1	7	0	0	2	0	0	0
Hyperemia	15	19	19	1	7	3	0	0	1	0	0	1
Graft shrinkage/gaping	1	2	1	0	1	4	0	0	1	0	1	0
Chemosis	1	3	1	1	0	0	1	2	0	0	0	0
Graft dehiscence	1	2	2	0	0	0	0	0	0	0	0	0
Recurrence		0	0		0	0		1	0	1	1	2
Pyogenic granuloma	0	0	2	0	1	1	0	0	1	0	0	1
Blurred vision	2	1	1	1	1	1	0	0	0	0	0	0
Photophobia	1	8	2	0	6	2	0	1	1	0	0	0

## DISCUSSION

In this study, each group had 50 patients (total of 150 patients in 3 groups) with unilateral or bilateral pterygium who fulfilled the inclusion criteria [Table 1]. Our study population matches with the prospective study by Kavita Malli Karjun Salagar et al.<sup>[15]</sup> [Table 2] showed, maximum no. of cases were between 37 years and 72 years with the mean age of 50.93 years. The study population included patients who were more than 18 years of age. Only 1 case was more than 72 years age. The mean age of the patients can be compared to the studies by Elzlitni NM,<sup>[16]</sup> Srinivasapuram.<sup>[17]</sup> The etiology of pterygium was hypothesized to ultraviolet ray induced stem cell disruption. Other predisposing factors were exposure of heat, dust and prolonged outdoor activity. In the present study [Table 1] it was observed that number of male patients were more (i.e 82.66%). Singh SK,<sup>[18]</sup> Muhammad Sharjeel et al.<sup>[19]</sup> Elzlitni NM et al,<sup>[16]</sup> also observed male predominance. Male predominance can be explained by the prolonged outdoor work which makes men more vulnerable to sun exposure and exposure to dust. (Coroneo MT) Though females also work in agricultural fields,<sup>[20]</sup> this study couldn't authoritatively explain this difference of incidence on the basis of gender. Among 150 patients in this study, 137 patients had unilateral pterygium whereas only 13 patients had bilateral pterygium table 1 Study by Valentín HuerVa et al.<sup>[21]</sup> Khan NA,<sup>[22]</sup> Elzlitni NM.<sup>[16]</sup> corroborate with our observation. In present study Table 1, 99.38% cases had nasal pterygium and rest had temporal location ( $p < 0.5$ ). D de Wit,<sup>[23]</sup> had observed the same. TABLE 3 Mean size of pterygium was  $2.887 + 0.7729$  in this study. In a study by Shaaban AM,<sup>[24]</sup> size of the pterygium was more than the findings in this study. Table 4 Atrophic/degenerative pterygium involved more no of eyes whereas a study by K Krishnaram.<sup>[25]</sup> It was observed that 67.82% were progressive type. Progressive pterygium is mainly found in persons exposed to high doses of UV rays, usually from sunlight, as in agricultural laborers and people exposed to arc welding without proper protection glasses. Intraoperative time was more when suture is used. Mean surgical time in this group is  $46.2 + 1.34$ . Mean surgical time was reduced to almost half in cases where fibrin glue or glueless-sutureless interventions are performed. Mean surgical time for sutureless and glue free technique was significantly less as compared to management by suturing.<sup>[26-28]</sup> Post-operative complications-evaluation were described in [Table 5]. Pain was a present after immediate postoperative period in all 3 groups and this was subsided with progression of time. Patients with suturing experienced more pain than other two groups. Regarding the foreign body sensation again group II experienced more significant discomfort than other two groups. Lacrimation was significantly

high when there was suture material used i.e in group II. No statistically significant difference was noticed in the complications like haemorrhage, hyperaemia, blurred vision, photophobia and all these were subsided with progression of time. Graft shrinkage was present in 4 cases after 1-week post-operative in glueless-sutureless procedure. Recurrence was noticed after 6 months of post-operative period. one cases each in grI, and II. group III had 2 cases of recurrence. Pyogenic granuloma was seen in 2 cases of GrIII after day 1st. after 1 week post-operative period one cases each were seen in grII, grIII. After 1 month and 6 month 1 case in group III continued to have the infective granuloma. Postoperative symptoms were seen in less number of patients (20%) and were of shorter duration (2 weeks) in group managed by sutureless-glue free technique as compared to group where suture is used with 20 (80%) patients having symptoms lasting for 4 weeks; ( $p < 0.001$ ). Recurrence rate and conjunctival granuloma formation rate for group managed by sutureless-glue free technique (0%) and for group with suture (4%) were statistically insignificant. (Ashok Sharma et al).<sup>[27]</sup> Wadgaonkar SP et al,<sup>[29]</sup> reported the symptoms such as pain, photophobia, foreign body sensation, watering and conjunctival, and chemosis were significantly less in the subjects treated with glue than suture (for chemosis and photophobia [P 0.001] for pain and watering [P 0.001]). Three cases of recurrence in the suture group and one case of pyogenic granuloma in the fibrin glue group were observed. Ratnalingam V.<sup>[30]</sup> The use of fibrin adhesive in primary pterygium surgery with conjunctival autografts reduces the recurrence rate, surgical time, and postoperative pain when compared with sutures. Total graft dehiscence occurred in 2 eyes (5%), graft retraction in 3 eyes (7.5%) and recurrence was seen in 1 eye (2.5%). (Malik KP).<sup>[31]</sup> As per Sharmistha Goswami et al,<sup>[32]</sup> post-operative discomfort was significantly lower in the fibrin glue group than in the suture group ( $p < 0.001$ ). The incidence of complications were similar in both groups (4 each). At the end of follow-up, pterygium recurrence was observed in one eye (3.33%) in the fibrin glue group and in three eyes (10%) in the suture group ( $p < 0.05$ ).

## CONCLUSION

Fibrin glue is a two-component tissue adhesive that mimics the natural fibrin formation and is prepared from banked human blood. Fibrin glue has widely been used in ophthalmology in areas like conjunctival wound closure, cataract surgery, oculoplastic or orbital surgery, filtering bleb dehiscence, lamellar keratoplasty and amniotic membrane transplantation The use of fibrin glue to attach the free conjunctival autograft in pterygium surgery produces shorter operating time, less post-operative discomfort and lower recurrence rate

compared to sutures. Shorter surgery time logically translates into lower infection risk and saves valuable operating theatre time. The patient stands to benefit on account of an earlier return to normal life due to greater post-operative comfort. But considering the financial constraints of patients, as fibrin glue is expensive, always it is not possible to implement this procedure and as it is from banked human blood, risk of infections eg HIV, Hepatitis B etc increases.

Though we have studied on a relatively smaller population for shorter duration, being it a randomized prospective clinical one, we hope to add to the picture of the Indian subcontinent.

## REFERENCES

1. Kanski JJ. Clinical Ophthalmology. 6th ed. New York: Elsevier; 2007. Chapter 8, Conjunctiva; p240-42.
2. Cajucom-Uy H, Tong L, Wong TY, et al. The prevalence of and risk factors for pterygium in an urban Malay population: the Singapore Malay Eye Study (SiMES). Br J Ophthalmol 2010; 94:977.
3. West S, Muñoz B. Prevalence of pterygium in Latinos: Proyecto VER. Br J Ophthalmol 2009; 93:1287.
4. Viso E, Gude F, Rodríguez-Ares MT. Prevalence of pinguecula and pterygium in a general population in Spain. Eye (Lond) 2011; 25:350.
5. Fotouhi A, Hashemi H, Khabazkhoob M, Mohammad K. Prevalence and risk factors of pterygium and pinguecula: the Tehran Eye Study. Eye (Lond) 2009; 23:1125.
6. Ma K, Xu L, Jie Y, Jonas JB. Prevalence of and factors associated with pterygium in adult Chinese: the Beijing Eye Study. Cornea 2007; 26:1184.
7. Anderson JR. A pterygium map. Acta Ophthalmol 1954; 3:1631.
8. Singh G. Pterygium in the tropics. Ophthalmology 1990; 97:542.
9. Wiwanitkit V. Tropical pterygium. Bull Soc Belge Ophtalmol 2009; :7.
10. Threlfall TJ, English DR. Sun exposure and pterygium of the eye: a dose-response curve. Am J Ophthalmol 1999; 128:280.
11. Mackenzie FD, Hirst LW, Battistutta D, Green A. Risk analysis in the development of pterygia. Ophthalmology 1992; 99:1056.
12. Bradley JC, Yang W, Bradley RH, et al. The science of pterygia. Br J Ophthalmol 2010; 94:815.
13. Liang QF, Xu L, Jin XY, et al. Epidemiology of pterygium in aged rural population of Beijing, China. Chin Med J (Engl) 2010; 123:1699.
14. Xiu Wang, Yan Zhang, Lei Zhou, Ruihua Wei, Lijie Dong. Comparison of fibrin glue and Vicryl sutures in conjunctival autografting for pterygium surgery. Molecular Vision 2017; 23:275-28
15. Kavita MalliKarjun Salagar, Kalyanappa gurlingappa Biradar. Conjunctival Autograft in Primary and Recurrent Pterygium: A Study. Journal of Clinical and Diagnostic Research. 2013 Dec, Vol-7(12): 2825-2827
16. Elzlitni NM, Eldressi SS, Bukhatwa SA. Sutureless and glue-free conjunctival autograft for pterygium surgery: A preliminary report about Libyan experience. Libyan Int Med Univ J 2018;3:16-9.
17. Srinivasapuram Krishnachary Prabhakar. Safety profile and complications of autologous limbal conjunctival transplantation for primary pterygium. Saudi J Ophthalmol. 2014 Oct; 28(4): 262–267.
18. Singh SK. Pterygium: epidemiology prevention and treatment. Community Eye Health. 2017;30(99):S5-S6.
19. Muhammad Sharjeel, Farhan Ali, Irfan Qayyum Malik. Pakistan Journal of Ophthalmology Vol. 32, No. 4, Oct – Dec, 2016
20. Coroneo MT. Pterygium is an early indicator of ultraviolet insolation: a hypothesis. Br J Ophthalmology 1993;77:734-9
21. Valentín HuerVa, anna Marc H, Montserrat Martínez-alonso, M. Jesús Muniesa, carMen sancHez. Pterygium surgery by means of conjunctival autograft. long term follow-up. Arq Bras Oftalmol. 2012;75(4):251-5
22. Khan NA, Khan AA, Memon JI (2017) Surgical Management and Recurrence of Pterygium at Indus Medical College Hospital and Mohammad and Mohammad Al-Dossary Hospital. Adv Ophthalmol Vis Syst.2017; 6(2): 00173.
23. de Wit D, Athanasiadis I, Sharma A, Moore J; Sutureless and glue-free conjunctival autograft in pterygium surgery: a case series; Eye (Lond). 2010 Sep;24(9):1474
24. Shaaban A.M. Elwan. Comparison between sutureless and glue free versus sutured limbal conjunctival autograft in primary pterygium surgery. Saudi journal of ophthalmology 2014 ;28:292-298
25. K Krishnaram. Prevalence and pattern of pterygium. The Internet Journal of Ophthalmology and visual science. 2013;10(1).
26. Sumita Karandikar, Nita Shanbhag, Nupur Bhatt, Lanin Chen. Comparison of three different techniques for fixation of conjunctival autograft in pterygium surgery. Indian Journal of Clinical and Experimental Ophthalmology, October-December,2016;2(4): 350-355
27. Ashok Sharma, Hans Raj, Aditi Gupta, Amit Vikram Raina. Sutureless and Glue-free Versus Sutures for Limbal Conjunctival Autografting in Primary Pterygium Surgery: A Prospective Comparative Study. Journal of Clinical and Diagnostic Research. 2015 Nov, Vol-9(11): NC06-NC09
28. Singh PK, Singh S, Vyas C, Singh M. Conjunctival Autografting Without Fibrin Glue or Sutures for Pterygium Surgery; Cornea. 2012 Jun 25
29. Wadgaonkar SP, Tiwari RR, Patil PA, Kamble BS. Fibrin glue versus suture technique for pterygium excision: A prospective study in tertiary-based rural hospital. J Clin Ophthalmol Res 2017;5:23-7.
30. Ratnalingam V, Eu AL, Ng GL, Taharin R, John E. Fibrin adhesive is better than sutures in pterygium surgery. Cornea. 2010 May;29(5):485-9
31. Malik KP, Goel R, Gutpa A, Gupta SK, Kamal S, Mallik VK, Singh S; Efficacy of sutureless and glue free limbal conjunctival autograft for primary pterygium surgery; Nepal J Ophthalmol. 2012 Jul;4(8):230-5
32. Sharmistha Goswami, Soumya Swarup Chatterjee, Soumik Goswami, Gautam Bhaduri. A Comparative Study of use of fibrin glue and vicryl suture in conjunctival autograft transplantation following Pterygium Excision. Indian Journal of Basic and Applied Medical Research; December 2014: Vol.-4, Issue- 1, P. 169-175

**Copyright:** © the author(s), 2020. It is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits authors to retain ownership of the copyright for their content, and allow anyone to download, reuse, reprint, modify, distribute and/or copy the content as long as the original authors and source are cited.

**How to cite this article:** Banerjee D, Nandi P, Nandi P. Comparative Study of Fibrin Glue, Suturing and Sutureless / Glue Free Limbal Conjunctival Autograft for Primary Pterygium Surgery Attending a Regional Referral Centre in Eastern India. Ann. Int. Med. Den. Res. 2021; 7(2):OT05-OT09.

**Source of Support:** Nil, **Conflict of Interest:** None declared