

Pterygium Excision with Suture Less, Glue Free Conjunctival Auto graft

Suture Less
Pterygium
Excision

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ABSTRACT

Objective: To find out outcomes of pterygium excision with sutureless, glue free conjunctival auto graft.

Study Design: Observational / descriptive study.

Place and Duration of Study: This study was conducted at the Ophthalmology Department Unit-I, Dow University of Health Sciences, Civil Hospital Karachi from June 2011 to May 2015.

Materials and Methods: Either gender patients above 25 years of age enrolled for primary pterygium excision followed by limbal to limbal orientation of conjunctival auto graft without suture or adhesive glue. Recurrent pterygia, pseudo pterygia, ocular surface disorders, vascularized cornea, dry eye and patients already on topical anti metabolites were not included. Follow up was scheduled on 1st day, 1st week, 1st, 3rd, and finally 6th months. Chi square test was applied to check significance of recurrence with age, gender, occupation and graft size or graft application time.

Results: Out of 382 participants, 303 (79.3%) were males. Majority of patients (77.7%) were young between 25 to 45 years of age. Mean time required for graft application was 16.89 ± 2.58 (std) minutes. Recurrence of pterygium was found in 32 (8.4%) cases. No significant relationship of recurrence of pterygium was found with other variables like gender, age, occupation, graft size or graft application time.

Conclusion: Natural healing tendency of vascularized conjunctiva allow graft to adhere underlying scleral bed while well aligned autograft margins and limbal to limbal orientation do not allow overgrowth of fibrovascular conjunctival tissue thereby prevent recurrence of pterygium.

Key Words: Primary pterygium, sutureless, glue free, conjunctival auto graft, recurrence

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INTRODUCTION

Pterygium is a triangular wing shaped fibro vascular conjunctival growth arising from nasal side encroaching onto the cornea. It is degenerative, hyperplastic disorder along with inflammatory cell infiltrate and abnormal extracellular matrix accumulation at sub conjunctival level. Ultra violet light induced damage of the limbal stem cells with subsequent conjunctivalization of the cornea is the currently accepted etiology of pterygium^{1,2}. Some individuals or occupational groups are susceptible to develop pterygia. It is more common in drivers, welders, carpenters and those living in rural areas. The inhabitant of the countries with relatively high exposure to sunlight, hot, dry and dusty climates are more prone to develop pterygium^{3,4}.

Large pterygia induce greater amount of astigmatism⁵. Pterygium excision is required when chronic inflammation and/or irritation is not relieved by conservative therapy, pterygia progress to threaten

visual axis or when it become a cosmetic nuisance. Main complication with pterygium excision is recurrence. The simple pterygium excision with bare sclera has high recurrence rate. Various modalities used to avoid recurrence include use of mitomycin C, beta radiation, conjunctival and amniotic membrane graft with suture or adhesive glue but none has satisfactory results so far^{6,7}.

Conjunctival auto graft technique is gaining popularity despite variable recurrence rate and other complications. Suture material (vicryl or prolene) used for securing conjunctival autograft causes discomfort, scarring, infection, granuloma formation and chronic inflammation which usually require a second operation for removal. Fibrin glue is costly and produce possible hypersensitivity reaction and carries risk of viral transmission. Some studies favor the use of fibrin glue above sutures with improved comfort, decreased surgical time, reduced complication and recurrence rate^{8,9}. Recent cross sectional study describes the successful outcome with sutureless and glue free conjunctival autograft¹⁰.

Our population is prone to develop pterygia as we live in pterygium endemic zone¹¹. So this study was conducted on large number of primary pterygia to find out the outcome of pterygium excision with conjunctival autograft technique without use of suture or any adhesive glue.

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MATERIALS AND METHODS

This observational / descriptive study was conducted at Ophthalmology Department, Dow University of Health Sciences, Civil Hospital Karachi, from June 2011 to May 2015.

Either gender patients above 25 years of age having primary pterygia were enrolled after getting written consent with complete demographic data. Characteristics of pterygia including site, size, vascularity and extent across the cornea were noted. Recurrent pterygia, pseudo pterygia, ocular surface disorders, vascularized cornea, dry eye and patients already on topical anti metabolites were excluded from this study. Primary pterygia excised under local and/or topical anesthesia followed by conjunctival auto graft taken from superior bulber conjunctiva of the same eye and placed over the bare sclera.

The body of pterygium was grasped and cut with Westcott scissors up to limbus. Holding with forceps and gently pushing the body of pterygium with sponge swab towards cornea while asking the patient to look towards nasal side until the head detached from cornea. By this maneuver using opposite forces (patient looking nasally while sponge swab pushing temporally) no residual fibers were left behind and cornea become free of pterygium. Then, the dimensions of bare sclera were measured. Superior temporal conjunctiva of the same eye approximately 1mm greater than bare sclera was marked and inflated with normal saline. This makes easy dissection of the conjunctiva from the tenon. Keeping limbal to limbal orientation, edges of the graft were carefully aligned in all dimensions with margin of the conjunctiva without any suture or adhesive glue and left there for 10-20 minutes to get attached. Post operative follow up was scheduled on 1st day, 1st week, 1st, 3rd, and finally 6th months. Recurrence was defined as fibro vascular tissue crossing limbus and onto clear cornea in the area of previous pterygium excision.

Statistical analysis was done through SPSS version 16.0. The results were presented in terms of frequencies and percentages. Mean values and standard deviation were calculated for age and graft application time. Chi square test was applied to check significance of recurrence with age, gender, occupation and graft size or graft application time. P-value < 0.05 was considered statistically significant.

RESULTS

Out of 382 participants, 303 (79.3%) were males and 79 (20.7%) were females. Mean age of the patients was 41.81 ± 8.95 (std) years whereas minimum and maximum age was 27 and 67 years respectively. Majority of patients (77.7%) were young between 25 to 45 years of age. Occupation of the participants is shown in table 1. All participants completed at least 6 months

Table No.1: Demographic characteristics (n=382)

Variable	Frequency	Percentage(%)
Gender		
• Male	303	79.3
• Female	79	20.7
Age (years)		
• Minimum	27	
• Maximum	67	
• Mean	41.81 ± 8.95	
Age Group	std	26.7
• 25 – 35	102	51.0
• 36 – 45	195	
• 46 – 60	74	19.4
• > 60	11	2.9
Occupation		
• Farmer	68	17.8
• Labor	48	12.6
• Field Worker	48	12.6
• Office Worker	20	5.2
• Driver	53	13.9
• Welder	52	13.6
• Carpenter	44	11.5
• House Wife	41	10.7
• Other	8	2.1

Table No. 2: Output data (n=382)

Variable	Frequency	%age	P-Value
Graft Size			
• 6 mm	70	18.3	
• 7 mm	95	24.9	
• 8 mm	89	23.3	
• 9 mm	128	33.5	
Graft Application Time (minutes)			
• Minimum	11		
• Maximum	20		
• Mean	16.89 ± 2.58std		
Group		8.4	
• 11 – 12	32	7.3	
• 13 – 14	28	25.7	
• 15 – 16	98	22.5	
• 17 – 18	86	36.1	
• 19 – 20	138		
Complication			
• Recurrence	32	8.4	
• Graft Retraction	06	1.6	
• Graft Displacement	11	2.9	
• Granuloma	03	0.8	
• No complication	330	86.4	
Relationship of recurrence with			
• Gender			0.357
• Age			0.132
• Occupation			0.090
• Graft Size			0.928
• Graft Application time			0.665

P-value< 0.05 is considered statistically significant.

of follow up visits. Conjunctival graft size varies from 6 mm to 9 mm. Minimum time required for graft

application was 11 minutes and maximum was 20 minutes while mean time recorded was 16.89 ± 2.58 (std) minutes. In majority 330 (86.4%) cases no complication was seen while recurrence of pterygium was found in 32 (8.4%) cases only (table 2). No

statistically significant relationship of recurrence of pterygium was found with other variables like gender, age, occupation, graft size or graft application time (table 2).

Table No. 3: Comparative analysis about pterygium recurrence after conjunctival autograft

Author / Year	Type of Study	Number of Eyes	Technique used	Follow up Period (months)	Recurrence Rate
Koranyi et al / 2005 ¹⁴	Retrospective comparative	461	325 with fibrin glue 136 with sutures	6-112	5.3% with fibrin glue 13.5% with sutures
Bahar et al / 2007 ¹⁵	Randomized clinical trial	81	42 fibrin glue 39 with sutures	12	11.9% with fibrin glue 7.7% with suture
Jiang et al / 2008 ¹⁶	Prospective comparative	40	20 fibrin glue 20 with suture	12	5% with fibrin glue 10% with suture
Coral-Ghanem / 2010 ¹⁷	Prospective retrospective	100	106 eyes fibrin glue 58 eyes sutures	5	11.3% with fibrin glue 25.9% with sutures
Nieuwendaal et al/2011 ¹⁸	Retrospective	35	Fibrin glue	12	2.9%
Rubin et al / 2011 ¹⁹	Randomized clinical trial	47	21 with fibrin glue 26 with suture	6	4.76% with fibrin glue 7.69% with sutures
Hargun LD et al /2016*	Prospective	382	No glue, No suture	6-60	8.4 %

*This study for comparison

DISCUSSION

Male preponderance of pterygium development correlates with its etiology in susceptible individuals and occupational groups living in rural areas of the countries with relatively hot and dusty climates and being exposed to more sunlight (ultra violet radiation). We found more pterygium 297 (77.7%) cases in age group between 25 to 45 years. Obviously the young people are mainly involved in outdoor and laborious jobs in daily socio economic activities which are also evident from list of occupation of participants shown in table 1.

Patel D et al¹² found pterygium recurrence in young age individuals whereas Hueva V et al¹³ not only noticed young age for higher recurrence but also correlated size and morphology of pterygium with high recurrence rate. Heavily pigmented individuals have a higher recurrence of pterygium than lighter pigmented peoples as documented by Ayala M.⁸ We did not found any significant relationship of recurrence with age, gender, occupation, graft size or graft application time in this study.

Different surgical techniques adopted so far mainly focused to prevent recurrence of pterygium. Conjunctival auto graft either sutured or fixed with fibrin glue are widely practiced techniques now a days. Table 3 shows comparison of recurrence rate of sutures (7.7% to 25.9%) and fibrin glue (2.9% to 11.9%) when used for conjunctival auto graft after pterygium surgery¹⁴⁻¹⁹. In our study we did not used sutures or fibrin glue and allowed conjunctival auto graft to take its position by natural healing thereby do not encounter

glue and suture related complications while recurrent pterygium was observed in 8.4% cases only.

After comparing different techniques for pterygium excision, Alpay A et al²⁰ reported 4 months as mean time for developing recurrence and/or other complications. Our minimum follow up period was six months. We observed complications like graft retraction, graft displacement and granuloma formation in initial two weeks after pterygium excision while recurrence was noticed after four months and late post graft period. We found graft retraction in only 6 (1.6%) cases. Retraction is very minimal as long as meticulous dissection of the sub epithelial conjunctival tissue is respected¹⁰.

Surgical technique is the mainstay to overcome or reduce complications including recurrence. Special care should be observed while dissecting pterygium, conjunctival graft and placing it over the excision site. Only fibrovascular pterygium tissue and the immediate adjacent and subjacent tenon's capsule showing tortuous vessels were excised in our series. We avoided use of cautery and natural spontaneous haemostasis achieved. Carefully measure the dimensions of defect and tailor 1mm oversized graft to allow natural graft positioning without tension to prevent retraction. Tenon's layer should not be taken and graft tissue confined to anterior stromal layers of dissected conjunctiva. Limbal orientation of the graft maintained with host limbus. Such orientation of graft was also advocated by Oguz H et al and others^{21, 22} to prevent recurrence. In our study 10 to 20 minutes awaited after applying graft so as natural tendency of vascularized conjunctival graft allow its adherence over the host bare

sclera. Conjunctival healing rates of $3.16 \pm 0.17 \text{ mm}^2$ per day have been shown in rabbit models²³. Compression and close proximity to the excision site is added by apposition of lids which works as natural biological dressing and allow conjunctival autograft healing¹⁰.

CONCLUSION

Natural healing tendency of vascularized conjunctiva allow graft to adhere underlying scleral bed while well aligned autograft margins and limbal to limbal orientation do not allow overgrowth of fibrovascular conjunctival tissue thereby prevent recurrence of pterygium.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Dushku N, Reid TW. Immunohistochemical evidence that human pterygia originate from an invasion of vimentin-expressing altered limbal epithelial basal cells. *Curr Eye Res* 1994;13: 473-81.
- Kwok LS, Coronea MT. A Model for pterygium formation. *Cornea* 1994;13:219-24.
- Moran and Hollows. Pterygium and ultraviolet radiation: A positive correlation. *BJ Ophthalmol* 1984;68(5): 343.
- Coroneo DI, Girolamo, Wakefield. The pathogenesis of pterygia. *Current Opinion in Ophthalmology* 1999; 4: 282-88.
- Khan FA, Niazi SPK, Khan DA. The impact of pterygium excision on corneal astigmatism. *J Coll Phys Surg Pak* 2014; 24 (6): 404-07.
- Caliskan S, Orhan M, Irkec M. Intraoperative and post operative use of mitomycin -C in the treatment of primary pterygium. *Ophthalmic Surgery and Lasers* 1996;27(5):600-604.
- Taylan H, Sekeroglu E, Erdem NC, Dogn M, Yagmur E, Dogan A. Sutureless amniotic membrane transplantation combined with narrow - strip conjunctival autograft for pterygium. *Int Ophthalmol* 2011; 31(6): 433-38.
- Ayala M. Results of pterygium surgery using a biologic adhesive. *Cornea* 2008; 27 :663-667.
- Kim HH, Mun HJ, park HJ, Lee KW. Conjunctivolimbal autograft using a fibrin adhesive in pterygium surgery. *Korean J Ophthalmol* 2008; 22: 147-154.
- Wit D de, Athanasiadis I, Sharma A, Moore J. Sutureless and glue free conjunctival auto graft in pterygium surgery: A case series. *Eye* 2010;24: 1474-77..
- Kamil Z, Bokhari SA, Rizwi R. Comparison of conjunctival autograft and intra operative application of mitomycin C in the treatment of primary pterygium. *Pak J Ophthalmol* 2011;27: 221-25.
- Patel D, Vala R, Shah H, Brahmabhatt JN, Kothari RN, Rawal SV. Efficacy of limbal conjunctival autograft surgery with stem cells in primary and recurrent pterygium. *Gujrat Med J* 2015;70(1): 17-20.
- Huerta V, March A, Martinez-Alonso M, Muniesa MJ, Sanchez C. Pterygium surgery by means of conjunctival autograft: long term follow up. *Arq Bras Oftalmol* 2012; 75 (4): 251-55.
- Koranyi G, Seregard S, Kopp ED. The cut-and - paste method for primary pterygium surgery: long-term follow-up. *Acta Ophthalmol* 2002;13(4): 204-12.
- Bahar SI, Weinberger D, Gatton DD, Avisar R. Fibrin glue versus vinyl sutures for primary conjunctival closure in pterygium surgery : long-term results. *Curr Eye Res* 2007; 32(5):399-405
- Jiang J, Yang Y, Zhang M, Fu X, Bao X, Yao K. Comparison of fibrin sealant and sutures for conjunctival autograft fixation in pterygium surgery: one-year follow-up. *Ophthalmologica* 2008;222(2):105-11.
- Coral-Ghanem R, Oliveira RF, Furlanetto E, Ghanem MA, Ghanem VC. Conjunctival autologous transplantation using fibrin glue in primary pterygium. *Arq Bras Oftalmol* 2010;73(4):350-3.
- Neuwendaal CP, Van der meulen IJ, Mourits M, Lapid-Gortzak R. Long-term follow-up of pterygium surgery using a conjunctival autograft and tissucol. *Cornea* 2011;30(1):34-6
- Rubin MR, Dantas PE, Nishiwaki-Dantas MC, Felberg S. Efficacy of fibrin tissue adhesive in the attachment of autogenous conjunctival graft on primary pterygium surgery. *Arq Bras Oftalmol* 2011;74(2):123-6
- Alpay A, Ugurbas SH, Erdogan B. Comparing techniques for pterygium surgery. *Clin Ophthalmol* 2009; 3: 69-74.
- Oguz H, Kilitcioglu A, Yasar M. Limbal Conjunctival mini auto grafting for preventing recurrence after pterygium surgery. *Eur J Ophthalmol* 2006; 16:209-2013.
- Koch JM, Mellin JB, Wauble TN. The pterygium-Autologous-conjunctiva-Limbus transplantation as treatment. *Ophthalmol* 1992; 89:143-146.
- Zhu X, Beuerman RW, Cheng ZY, Ang LPK, Tan DTH. Kinetic Analysis of conjunctival epithelial wound healing in rabbit model. *Invest Ophthalmol Vis Sci* 2005;46: 4247.