IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 4 Ser.4 (April. 2022), PP 17-31
www.iosrjournals.org

An analysis of factors influencing the outcome of sutureless glue free conjunctivolimbal autograft pterygium surgery

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***Abstract**:*
Aim: *To analysis of factors influencing the outcome of sutureless glue-free conjunctivolimbal autograft for primary pterygium surgeries.*
METHODS: *Patients with encroachment upon cornea induce significant astigmatism, become cosmetically bothersome, recurrently inflammed were taken up for surgery. The factors that were analysed were- Age, Diabetes and Hypertension, Types of pterygium – Progressive, Stationary, Type of anesthesia – Topical, Peribulbar block, Site of donor conjunctiva – Superotemporal, Inferotemporal, Donor conjunctiva – Hydrated, Non hydrated, Recipient bed bleeding – Mild , Moderate ,Severe., Graft-size – Same as bare area, 1mm more with tuckling . Duration of patching the eyes – 4hrs, 21 hrs.Patients were followed up postoperatively upto 6 months. The outcome in terms of patient comfort, graft stability, graft inflammation, recurrence and other postoperative complications were analysed.*
RESULTS: *Out of 200 patients, 75- males & 125-females. Patient comfort was good in nonhypertensives(61.1%), non-diabetics(96.7%), progressive type(61.89%) with graft taken from superotemporal quadrant (48.24%), hydrated graft(68.04%), same sized graft(58.62%) and with mild recipient bed bleeding(95.4%), with 21hours of patching(66.5%)Graft stability was better in non-hypertensives (88.54%), non-diabetics(66.54%), under peribulbar block(60.9%), nonhydrated grafts (92.7%), same sized graft(89.7%), severe recipient bed bleeding(100%), 21hours of patching(89.3%). Graft inflammation was minimal in non-hypertensives(66.9%), non-diabetics(68.6%), progressive type(69.4%), peribulbar block(70.5%), inferotemporal quadrant (82.6%), hydrated grafts (71.1%), size >1mm (72.6%), severe recipient bed bleeding(70.6%).Recurrence was seen in 3(1.5%) &Granuloma in 2(1%) cases at the end of 6months.*
Conclusion: *Surgery with nonhydrated, moderate to severe recipient bed bleeding, with graft size same as bare area, under peribulbar block, with 21hrs of patching had good outcome. There is no statistically significant difference in the outcome in terms of hypertension, diabetes, type of pterygium and the site of the donor conjunctiva.*
***Key Words**: sutureless gluefree, conjunctival autograft, graft stability, recurrence*

Date of Submission: 02-04-2022 Date of Acceptance: 15-04-2022

I. Introduction:

Pterygium is a common conjunctival degenerative disorder. It is an abnormal growth of wing shaped fold of conjunctiva and fibrovascular tissue encroaching on to superficial cornea always in the palpebral fissure, more often nasally than temporally. [1,2] Pterygium warrants treatment when they encroach upon cornea (3-4mm), induce significant astigmatism, become cosmetically bothersome, recurrently inflammed or restricts ocular motility.[1,2]

A variety of surgical techniques have been developed in pterygium management.[1] Of which Pterygium excision with conjuctivolimbal autograft is very efficient and widely accepted.The conjunctivolimbal autograft can be secured to the bare sclera by sutures, fibrin glue or by suture less glue free methods.Sutureless grafting represents a similar mucosal membrane tissue environment to the conjunctiva of the eye. [1,3]

Many clinical studies have been carried on suturing, fibrin glue or suture less glue free methods for fixation of conjunctivolimbal autograft. As suture less and glue free method is very economical, we wanted to know the factors that influence the outcome in this method so that we could find out the ways by which this

technique could be made more successful (effective), as it could be very effective in treating poor patients attending our institute outpatient department. So an effort has been made to find out the factors that influence the outcome of sutureless glue-free conjunctivolimbal autograft for primary pterygium surgery.

II. Methodology

Aim of the study was to analyse of factors influencing the outcome of sutureless glue-free conjunctivolimbal autograft for primary pterygium surgeries.The factors to be analysed are

Age, Diabetes, Hypertension, Types of pterygium – Progressive, Stationary, Type of anesthesia – Topical, Peribulbar block, Site of donor conjunctiva – Superotemporal, Inferotemporal, Donor conjunctiva – Hydrated, Non hydrated, Recipient bed bleeding – Mild , Moderate ,Severe., Graft-size – Same as bare area, 1mm more with tuckling, and Duration of patching the eyes – 4hrs, 21 hrs..

To study the outcome in terms of patient comfort, graft stability, graft inflammation, recurrence and other postoperative complications .Inclusion criteria was patients above 18 years of age of either sex .with primary pterygium consenting for surgery. Recurrent pterygiums, Pseudopterygium, Patients less than 18 years of age, Atrophic pterygium, Patients on anticoagulants, Patients with pre-existing glaucoma, Patients with immune system disease, eyelid or ocular surface disease like blepharitis, sjogrens syndrome and dry eye and previous ocular surgery or trauma were excluded from the study. Institutional Ethics committee clearance was obtained.

It was a prospective interventional study were all patients attending OPD of department of ophthalmology fulfilling inclusion and exclusion criteria were examined for visual acuity,refraction, slit lamp biomicroscopy, measurement of intraocular pressure and dilated fundoscopy.Patients with encroachment upon cornea (3-4mm), induce significant astigmatism, become cosmetically bothersome, recurrently inflammed were taken up for surgery.Written consent for study will be obtained after informing the study subjects the details of the procedure and probable complications in their local language.

After all necessary investigations and physician fitness and consent for surgery, they will be posted for pterygium excision with sutureless glue-free conjunctivolimbal autograft.

Surgical technique: After the pterygium excision, recipient bed area was allowed to bleed and the conjunctival auto graft was placed on this collected blood and waited for 1minute for the adherence of the graft onto the bed. Subconjunctival injection dexamethasone and gentamicin was given and the eye was patched

Follow up: Patients were followed up postoperatively on day 1 or 2, 1 week, 6 weeks and 6 months and in each visit patient will undergo thorough slit lamp examination and examined for graft stability, recurrence and other complications and patient comfort will be analyzed on the basis of Visual Analogue Scale(fig 1). Pterygium recurrence was defined as any fibrovascular growth that has passed the limbus by more than 1 mm. Graft success was defined as an intact graft by the 6th week after surgery and graft failure was defined as absence of the graft by the 6th week.

Subjective sensation of pain, foreign body sensation, tearing, and discomfort were analyzed using Visual analogue scale.

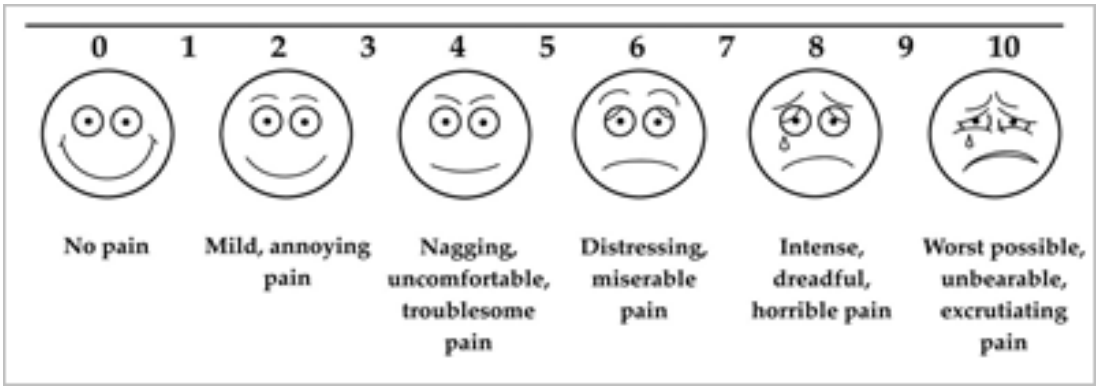


FIG 1: Visual analogue scale

Post-operative grading of inflammation was done as follows:[4].

Grade 0 - No dilated corkscrew vessel in the graft;

Grade 1 - 1 bright red, dilated corkscrew vessel crossing the graft bed margin;

Grade 2 - 2 bright red dilated corkscrew vessels crossing the graft bed margin;

Grade 3 - 3 bright red dilated corkscrew vessels crossing the graft bed margin;

Grade 4 - ≥3 bright red dilated corkscrew vessels crossing the graft bed margin.

Majority of the grafts were stable and assessment for graft stability is graded as Grade 0: All four sides of the graft margin are well apposed; Grade 1: Gaping/displacement of one side of the graft-bed junction; Grade 2: Gaping/displacement of two sides of the graft-bed junction; Grade 3: Gaping/displacement of three sides of the graft-bed junction; Grade 4: Graft completely displaced from the bed
Post operatively patients were treated with antibiotic-steroid combination eye drops 10 times a day for 1 week and tapered up to 6 weeks, NSAID eye drops and artificial tears for 6 weeks.

The data collected will be analyzed statistically using descriptive statistics like frequency and percentage. . Results will be analyzed by using appropriate statistical tests.

III. Results

Among 200 eyes, 75 were males, 125 were females with mean age of 38.94yrs ranging from 12 to 65yrs. Among the 200patients, laterality wise 157 had nasal pterygium, 42 had temporal pterygium and one had both nasal and temporal pterygium. 85 had pterygium in right eye, 115 in left eye.180 were non hypertensives,20 were hypertensives. 194 were non-diabetics, 6 were diabetics. 186 had progressive type(fig2), 14 had stationary type of pterygium. 133 were done under peribulbar block, 67 under topical anaesthesia.85 grafts were taken from superotemporal quadrant, 115 from inferotemporal quadrant. 97 were non-hydrated graft, 103 were hydrated graft. 116 grafts were of same size of bare scelra, 84 grafts were 1mm more than the size of bare sclera with tucking. 66 of them had mild recipient bed bleeding, 68 with moderate and 66 with severe recipient bleeding. 176 of them were patched for 21hours, and patch was removed after 4hours in 24patients.
Patient comfort, graft stability, graft inflammation were analysed on postoperative day 1(Fig 3). Recurrence and other postoperative complication were analysed at the end of six months(fig 4).
Analysis of patiemt comfort Patient comfort was analysed on postoperative day 1 with visual analogue scale.123 patients (61.5%) had good comfort with visual analogue score of 1. Among them 18 (9%)were in the age group of 15-25yrs, 62(31%) between 26-35yrs, 78(39%) between 36-45yrs and 42(21%) in the age group >45yrs.Good patient comfort was seen in the middle aged patients between 36-45yrs (42.3%). Only 3(1.5%) patients had a visual analogue score of 6 which was maximum score. Among the patients with poor patient comfort 66.7% of the patients were >45yrs (table 1).Among 180 nonhypertensives, 108(61.1%) had good comfort with visual analogue score of 1 and only one patient had a score of 6. Among 20 hypertensives, good comfort with visual analogue score of 1was seen in 12(60%) hypertensives(table 2). Among 6 Diabetics, 4(66.66%) had good comfort with visual analogue score of 1 andAmong 194 nondiabetics, 119(96.7%) of non diabetic patients had good comfort with visual analogue score of 1(table 3). Among 186 patients with Progressive type of pterygium, 115(61.89%) had good comfort with visual analogue score of 1. Among 14 patients with stationary type had good comfort with visual analogue score of 1 was seen in 8(57.14%) patients(table 4). Among 85 patients with superotemporal grafts, 41(48.24%) patients had good comfort with visual analogue score of 1 . Among 115 patients with inferotemporal grafts, 82(71.3%) patients good comfort with visual analogue score of 1. (P=.001) (table 5). Among 97 patients with nonhydrates grafts, 66(68.04%) patients had good comfort with visual analogue score of 1. Among 113 patients with hydrated grafts, 57 (50.44%) patients had good comfort with visual analogue score of 1(P=.001) (table 6). Among the 116 patients with graft size same as the bare scelra, 68(58.62%) patients good comfort with visual analogue score of 1, Among 84 patients with graft size>1mm with tucking 55(65.5%) had good comfort with visual analogue score of 1(table 7). Among 66 patients with mild recipient bed bleeding, 63(95.45)patients had good comfort with visual analogue score of 1 and 39 (57.35%) patients with moderate recipient bed bleeding had good comfort with visual analogue score of 1 and 21(31.8%) patients with severe bed bleeding had good comfort with visual analogue score of 1(P=.000) (table 8). Among 132 patients underwent surgery under peribulbar block, 70(53.03%)patients had good comfort with visual analogue score of 1 and Among 67 patients underwent surgery under topical anaesthesia, 52(77.6%)patients had good comfort with visual analogue score of 1(P= 0.003) (table 9). Among the 176 patients with 21 hours of patching, 117 (66.5%) patients had good comfort with visual analogue score of 1 and Among 24 patients with 4 hours of patching 6patients (25%) had good comfort with visual analogue score of 1.(P=.000) (table 10).This patient discomfort lasted for 1 week postoperatively. All the patients had a score of 1 in visual analogue scale at the end of 1 week.

Table1. Comparison of this study with other studies

			Patient comfort						Total
			1	2	3	4	5	6	
Age group(yrs)	15 to 25	Count	8	0	5	4	1	0	18
		% within patientcomfortday1	6.5%	0.0%	31.2%	19.0%	11.1%	0.0%	9.0%
	26 to 35	Count	38	15	2	1	5	1	62
		% within patientcomfortday1	30.9%	53.6%	12.5%	4.8%	55.6%	33.3%	31.0%
	36 to 45	Count	52	10	6	9	1	0	78

		% within patientcomfortday1	42.3%	35.7%	37.5%	42.9%	11.1%	0.0%	39.0%
	> 45	Count	25	3	3	7	2	2	42
		% within patientcomfortday1	20.3%	10.7%	18.8%	33.3%	22.2%	66.7%	21.0%
Total		Count	123	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 2 HTN * patientcomfortday1

			Patient comfort						Total
			1	2	3	4	5	6	
HTN	NO	Count	110	28	14	18	9	1	180
		% within patientcomfortday1	89.3%	100.0%	87.5%	85.7%	100.0%	33.3%	89.9%
	YES	Count	12	0	2	3	0	2	20
		% within patientcomfortday1	10.7%	0.0%	12.5%	14.3%	0.0%	66.7%	10.1%
Total		Count	122	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3 DM * patientcomfortday1

			Patient comfort						Total
			1	2	3	4	5	6	
DM	NO	Count	119	28	14	21	9	3	194
		% within patientcomfortday1	96.7%	100.0%	87.5%	100.0%	100.0%	100.0%	97.0%
	YES	Count	4	0	2	0	0	0	6
		% within patientcomfortday1	3.3%	0.0%	12.5%	0.0%	0.0%	0.0%	3.0%
Total		Count	123	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 4 Typeprog/stationary * patientcomfortday1

				Patient comfort						Total
				1	2	3	4	5	6	
Type of pterygium	Progressive	Count		115	24	14	21	9	3	186
		% within patientcomfortday1		93.5%	85.7%	87.5%	100.0%	100.0%	100.0%	93.0%
	Stationary	Count		8	4	2	0	0	0	14
		% within patientcomfortday1		6.5%	14.3%	12.5%	0.0%	0.0%	0.0%	7.0%
Total		Count		123	28	16	21	9	3	200
		% within patientcomfortday1		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5 DONARsite sup/IT * patientcomfortday1

				Patient comfort						Total
				1	2	3	4	5	6	
DONAR site	Supratemporal	Count		41	18	7	11	8	0	85
		% within patientcomfortday1		33.3%	64.3%	43.8%	52.4%	88.9%	0.0%	42.5%
	Infratemporal	Count		82	10	9	10	1	3	115
		% within patientcomfortday1		66.7%	35.7%	56.2%	47.6%	11.1%	100.0%	57.5%
Total		Count		123	28	16	21	9	3	200
		% within patientcomfortday1		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 6 hydrated/nonhydrated * patientcomfortday1

				Patient comfort						Total
				1	2	3	4	5	6	
GRAFT hydration	Hydrated	Count		66	18	7	1	4	1	97
		% within patientcomfortday1		53.7%	64.3%	43.8%	4.8%	44.4%	33.3%	48.5%

	Non-hydrated	Count	57	10	9	20	5	2	103
		% within patientcomfortday1	46.3%	35.7%	56.2%	95.2%	55.6%	66.7%	51.5%
Total		Count	123	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 7 graftsizesame/>1mm * patientcomfortday1

			Patient comfort						Total
			1	2	3	4	5	6	
Graft size	Same	Count	68	16	13	11	5	3	116
		% within patientcomfortday1	55.3%	57.1%	81.2%	52.4%	55.6%	100.0%	58.0%
	1mm more with tucking	Count	55	12	3	10	4	0	84
		% within patientcomfortday1	44.7%	42.9%	18.8%	47.6%	44.4%	0.0%	42.0%
Total		Count	123	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 8 recepientbedbleeding * patientcomfortday1

			Patient comfort						Total
			1	2	3	4	5	6	
Recepient bed bleeding	Mild	Count	63	0	0	0	0	3	66
		% within patientcomfortday1	51.21%	0.0%	0.0%	0.0%	0.0%	100.0%	62.0%
	Moderate	Count	39	10	8	6	5	0	68
		% within patientcomfortday1	31.7%	35.7%	50.0%	28.6%	55.6%	0.0%	34.0%
	Severe	Count	21	18	8	15	4	0	66
		% within patientcomfortday1	17.07%	64.3%	50.0%	71.4%	44.4%	0.0%	4.0%
Total		Count	123	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 9 AnaesthesiaPBB/topical * patientcomfortday1

			Patient comfort						Total
			1	2	3	4	5	6	
Anaesthesia	Peribulbar	Count	70	18	15	17	9	3	133
		% within patientcomfortday1	57.4%	64.3%	93.8%	81.0%	100.0%	100.0%	66.3%
	Topical	Count	52	10	1	4	0	0	67
		% within patientcomfortday1	42.6%	35.7%	6.2%	19.0%	0.0%	0.0%	33.7%
Total		Count	122	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 10 durationofpatching21hrs/4hrs * patientcomfortday1

			Patient comfort						Total
			1.00	2.00	3.00	4.00	5.00	6.00	
Duration of patching	21 HRS	Count	117	25	11	13	7	3	176
		% within patientcomfortday1	95.1%	89.3%	68.8%	61.9%	77.8%	100.0%	88.0%

	4 HRS	Count	6	3	5	8	2	0	24
		% within patientcomfortday1	4.9%	10.7%	31.2%	38.1%	22.2%	0.0%	12.0%
Total		Count	123	28	16	21	9	3	200
		% within patientcomfortday1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Analysis of graft stability Graft stability has been analysed considering grade 0 and grade 1 as good & stable grafts.Good graft stability was seen in 52 patients in the age group of 36-45yrs (45.8%), poor stability was seen in 2 patients in the age group >45yrs(table 11). Graft stability was better in 159(89.4%) nonhypertensives and 15 (85%) hypertensive patients(table 12).Among 194 non-diabetics, 174 (89.7%) patients had good graft stability, and among 6 diabetic patients, 4 (66.7%) had good graft stability(table 13).Graft stability was good in 166(89.20%) progressive type of pterygium and Poor graft stability was present in 2(1.1%) of progressive type of pterygium. Graft stability was good in 12(85.7%) stationary type of pterygium. There is no statistically significant difference between the two groups in terms of graft stability(table 14).Among 115cases, 107(93%) of grafts taken from infratemporal quadrant had good graft stability. Among 85cases, 71(83.5%) of grafts taken from superotemporal quadrant had of grafts taken from infratemporal quadrant had good graft stability(P=.000) (table 15).Among 97patients, 90(92.7%) of non hydrated grafts had good graft stability and among 103 patients, 88(85.4%) of hydrated grafts had good graft stability(P=.089) (table 16).Graft stability was good in 104(89.7%) patients with graft size same as bare area, and 74(88.1%) patients with graft size 1mm more wuth tucking. This was statistically significant(P = .002) (table 17). Graft stability was good in severe recipient bed bleeding 66(100%)of patients when compared with 50(57.4%) with mild and 62(91.2%) of patients with moderate recipient bed bleeding.This difference was statistically significant.(P=.001) (table 18). Graft stability was good in 116(87.2%) patients underwent surgery under peribulbar block and 53(79.1%) of patients who underwent surgery under peribulbar block(P=.012) (table 19). Graft stability was better in those with 21 hours of patching-157(89.3%) patients where as only 21(87.5%)of the patients with 4 hours of patching had good graft stability. This was statistically significant (P=.012) (table 20). We found, 2 (1%) patients had grade 4 graft stability i.e, all four sides of graft completely displaced from the bed on postop day1, later these grafts were repositioned and sutured.

Table 11 Graft stability has been analysed considering grade 0 and grade 1 as good & stable grafts. Graftstability VS Agegroup

			Graft stability					Total
			0	1	2	3	4	
Age group (yrs)	15 to 25	Count	8	5	5	0	0	18
		%	6.5%	11.11%	31.2%	00%	0.0%	9.0%
	26 to 35	Count	38	20	2	2	0	62
		%	30.9%	53.6%	12.5%	4.8%	0.0%	31.0%
	36 to 45	Count	60	17	6	2	0	78
		%	45.8%	35.7%	37.5%	42.9%	0.0%	39.0%
	> 45	Count	25	3	3	2	2	42
		%	20.3%	10.7%	18.8%	33.3%	100.0%	21.0%
Total		Count	131	45	14	6	2	200
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 12 graftstabilityday1 * HTN

			HTN		Total
			NO	YES	
Graft stability	0	Count	116	15	133
		% within HTN	65.2%	75.0%	66.2%
	1	Count	43	2	45
		% within HTN	24.2%	10.0%	22.7%
	2	Count	11	3	14
		% within HTN	6.2%	15.0%	7.1%
	3	Count	6	0	6
		% within HTN	3.4%	0.0%	3.0%
	4	Count	2	0	2
		% within HTN	1.1%	0.0%	1.0%
Total		Count	178	22	200
		% within HTN	100.0%	100.0%	100.0%

Table 13 graftstabilityday1 * DM

		DM		Total
		NO	YES	
Graft stability	0 Count	129	4	133
	0 % within DM	66.5%	66.7%	66.5%
	1 Count	45	0	45
	1 % within DM	23.2%	0.0%	22.5%
	2 Count	12	2	14
	2 % within DM	6.2%	33.3%	7.0%
	3 Count	6	0	6
	3 % within DM	3.1%	0.0%	3.0%
	4 Count	2	0	2
	4 % within DM	1.0%	0.0%	1.0%
Total	Count	194	6	200
	% within DM	100.0%	100.0%	100.0%

Table 14 graftstabilityday1 * Typeprog/stationary

		Type of pterygium		Total
		PROGRESSIVE	STATIONARY	
Graft stability	0 Count	125	8	133
	0 % within Typeprog/stationary	67.2%	57.1%	66.5%
	1 Count	41	4	45
	1 % within Typeprog/stationary	22.0%	28.6%	22.5%
	2 Count	12	2	14
	2 % within Typeprog/stationary	6.5%	14.3%	7.0%
	3 Count	6	0	6
	3 % within Typeprog/stationary	3.2%	0.0%	3.0%
	4 Count	2	0	2
	4 % within Typeprog/stationary	1.1%	0.0%	1.0%
Total	Count	186	14	200
	% within Typeprog/stationary	100.0%	100.0%	100.0%

Table 15 graftstabilityday1 * DONARsite sup/IT

		DONAR site		Total
		SUPRATEMPORAL	INFRATEMPORAL	
Graft stability	0 Count	41	92	133
	0 % within DONARsite sup/IT	48.2%	80.0%	66.5%
	1 Count	30	15	45
	1 % within DONARsite sup/IT	35.3%	13.0%	22.5%
	2 Count	8	6	14
	2 % within DONARsite sup/IT	9.4%	5.2%	7.0%
	3 Count	6	0	6
	3 % within DONARsite sup/IT	7.1%	0.0%	3.0%
	4 Count	0	2	2
	4 % within DONARsite sup/IT	0.0%	1.7%	1.0%
Total	Count	85	115	200
	% within DONARsite sup/IT	100.0%	100.0%	100.0%

Table 16 **graftstabilityday1 * hydrated/nonhydrated**

		GRAFT HYDRATION		Total
		NONHYDRATED	HYDRATED	
Graft stability	0 Count	66	67	133
	0 % within hydrated/nonhydrated	68.0%	65.0%	66.5%
	1 Count	24	21	45
	1 % within hydrated/nonhydrated	24.7%	20.4%	22.5%
	2 Count	7	7	14
	2 % within hydrated/nonhydrated	7.2%	6.8%	7.0%
	3 Count	0	6	6
	3 % within hydrated/nonhydrated	0.0%	5.8%	3.0%
	4 Count	0	2	2
	4 % within hydrated/nonhydrated	0.0%	1.9%	1.0%
Total	Count	97	103	200

	% within hydrated/nonhydrated	100.0%	100.0%	100.0%

Table 17 graftstabilityday1 * graftsizesame/>1mm

		Graft size		Total
		SAME	1MM MORE WUTH TUCKING	
graftstabilityday1	0 Count	74	59	133
	0 % within graftsizesame/>1mm	63.8%	70.2%	66.5%
	1 Count	30	15	45
	1 % within graftsizesame/>1mm	25.9%	17.9%	22.5%
	2 Count	12	2	14
	2 % within graftsizesame/>1mm	10.3%	2.4%	7.0%
	3 Count	0	6	6
	3 % within graftsizesame/>1mm	0.0%	7.1%	3.0%
	4 Count	0	2	2
	4 % within graftsizesame/>1mm	0.0%	2.4%	1.0%
Total	Count	116	84	200
	% within graftsizesame/>1mm	100.0%	100.0%	100.0%

Table 18 graftstabilityday1 * recepientbedbleeding

		Recepient bed bleeding			Total
		MILD	MODERATE	SEVERE	
Graft stability	0 Count	24	45	64	133
	0 % within recepientbedbleeding	36.4%	66.2%	96.7%	66.5%
	1 Count	26	17	2	45
	1 % within recepientbedbleeding	21.0%	25.0%	3.0%	22.5%
	2 Count	12	2	0	14
	2 % within recepientbedbleeding	9.7%	2.9%	0.0%	7.0%
	3 Count	4	2	0	6
	3 % within recepientbedbleeding	3.2%	2.9%	0.0%	3.0%
	4 Count	0	2	0	2
	4 % within recepientbedbleeding	0.0%	2.9%	0.0%	1.0%
Total	Count	66	68	66	200
	% within recepientbedbleeding	100.0%	100.0%	100.0%	100.0%

Table 19 graftstabilityday1 * AnaesthesiaPBB/topical

			Anaesthesia		Total
			PERIBULBAR	TOPICAL	
Graft stability	0	Count	81	52	133
		% within AnaesthesiaPBB/topical	60.9%	77.6%	66.5%
	1	Count	35	1	36
		% within AnaesthesiaPBB/topical	26.3%	1.5%	22.5%
	2	Count	13	10	23
		% within AnaesthesiaPBB/topical	9.8%	14.9%	7.0%
	3	Count	2	4	6
		% within AnaesthesiaPBB/topical	1.5%	6.0%	3.0%
	4	Count	2	0	2
		% within AnaesthesiaPBB/topical	1.5%	0.0%	1.0%
Total		Count	133	67	200
		% within AnaesthesiaPBB/topical	100.0%	100.0%	100.0%

Table 20 **graftstabilityday1 * durationofpatching21hrs/4hrs**

		Duration of patching		Total
		21HRS	4 HRS	
Graft stability	0 Count	121	12	133
	0 % within durationofpatching21hrs/4hrs	68.8%	50.0%	66.5%
	1 Count	36	9	45
	1 % within durationofpatching21hrs/4hrs	20.5%	37.5%	22.5%
	2 Count	13	1	14

	% within durationofpatching21hrs/4hrs	7.4%	4.2%	7.0%
3	Count	6	0	6
	% within durationofpatching21hrs/4hrs	3.4%	0.0%	3.0%
4	Count	0	2	2
	% within durationofpatching21hrs/4hrs	0.0%	8.3%	1.0%
Total	Count	176	24	200
	% within durationofpatching21hrs/4hrs	100.0%	100.0%	100.0%

Analysis of graft inflammation Graft inflammation was minimal grade 0 in 52 patients (38.5%) in the age group of 36-45yrs, grade 4 inflammation was seen in one patient of >45yrs of age group(table 21).Graft inflammation was minimal in 119(66.9%) of non-hypertensives, 16(80%) of hypertensives and and grade more than/ equal to grade 2 inflammation seen in 19(10.7%)non-hypertensives(table 22). Graft inflammation was minimal in 133(68.6%) of nondiabetics, 04(66.7%) of diabetics and grade more than/ equal to grade 2 inflammation seen in 19(9.8%)non- diabetics(table 23). Graft inflammation was minimal in 129(69.4%) cases with progressive type of pterygium and 8 (57.1%) of stationary type. Graft inflammation more than grade 2 was seen in 19(10.2%) cases with progressive type of pterygium and 2 (14.3%) of stationary type(table 24). Graft inflammation was minimal in 42(49.4%) cases with graft taken from superotemporal quadrant and 95(82.6%) cases with graft taken from inferotemporal quadrant. This difference was statistically significant(P=.000) (table 25). Graft inflammation was minimal in 69(71.1%) cases with hydrated graft and 68(66%) of nonhydrated graft. Graft inflammation more than grade 2 was seen in 7(7.2%) cases with hydrated graft and 14 (13.6%) cases with non-hydrated grafts(table 26). Graft inflammation was minimal in 76(65.5%) cases with graft of same size as bare sclera and 61(72.6%) of graft size >1mm of bare sclera. Graft inflammation more than grade 2 was seen in 13(11.2%) cases with graft of same size as bare sclera and 8(8.6%) of graft size >1mm of bare sclera. This was statistically significant.(P=.021) (table 27). Graft inflammation was minimal in 23(34.8%) cases with mild recipient bed bleeding and 48(70.6%) moderate recipient bed bleeding and 28 (42.2%) severe recipient bed bleeding. Inflammation equal/more than grade 2 was seen in 19(21.4%)cases with mild recipient bed bleeding and 4(5.9%) moderate recipient bed bleeding and 28 (42.1%) severe recipient bed bleeding(table 28).Graft inflammation was minimal in 85(63.9%) cases under peribulbar block and 52(77.6%)cases under topical anaesthesia. This difference was statistically significant(P=.002) (table 29). Graft inflammation was minimal in 124(70.5%) cases with 21hours of patching and 13(54.2%) with 4hours of patching. Graft inflammation more than grade2 was seen in 19(10.9%) cases with 21hours of patching and 2(8.3%) cases with 4hours of patching(P=.001) (table 30). Graft inflammations were treated with antibiotic with steroid eye drops in a tapering manner with topical NSAIDs drops. Inflammation reduced completely by the end of two weeks in all the patients.

Table 21 Graftinflammationvs agegroup

			Graft inflammation					Total
			0	1	2	3	4	
Age group (yrs)	15 to 25	Count	13	0	5	0	0	18
		%	6.5%	0.0%	31.2%	0.0%	0.0%	9.0%
	26 to 35	Count	45	20	2	1	0	62
		%	33.3%	53.6%	12.5%	25.0%	0.0%	31.0%
	36 to 45	Count	52	10	6	2	0	78
		%	38.5%	35.7%	37.5%	50%	0.0%	39.0%
	> 45	Count	25	3	3	1	1	42
		%	20.3%	10.7%	18.8%	25.0%	100.0%	21.0%
Total		Count	135	42	16	4	1	200
		%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 22 graftinflammationday1 * HTN

			HTN		Total
			NO	YES	
Graft inflammation	0	Count	119	16	137
		% within HTN	66.9%	80.0%	68.2%
	1	Count	40	2	42
		% within HTN	22.5%	10.0%	21.2%
	2	Count	14	2	16
		% within HTN	7.9%	10.0%	8.1%
	3	Count	4	0	4
		% within HTN	2.2%	0.0%	2.0%
	4	Count	1	0	1

	% within HTN	0.6%	0.0%	0.5%
Total	Count	178	20	200
	% within HTN	100.0%	100.0%	100.0%

Table 23 graftinflammationday1 * dm

		DM		Total
		NO	YES	
Graft inflammation	0 Count	133	4	137
	0 % within DM	68.6%	66.7%	68.5%
	1 Count	42	0	42
	1 % within DM	21.6%	0.0%	21.0%
	2 Count	14	2	16
	2 % within DM	7.2%	33.3%	8.0%
	3 Count	4	0	4
	3 % within DM	2.1%	0.0%	2.0%
	4 Count	1	0	1
	4 % within DM	0.5%	0.0%	0.5%
Total	Count	194	6	200
	% within DM	100.0%	100.0%	100.0%

Table 24 graftinflammationday1 * Typeprog/stationary

		Type of pterygium		Total
		PROGRESSIVE	STATIONARY	
Graft inflammation	0 Count	129	8	137
	0 % within Typeprog/stationary	69.4%	57.1%	68.5%
	1 Count	38	4	42
	1 % within Typeprog/stationary	20.4%	28.6%	21.0%
	2 Count	14	2	16
	2 % within Typeprog/stationary	7.5%	14.3%	8.0%
	3 Count	4	0	4
	3 % within Typeprog/stationary	2.2%	0.0%	2.0%
	4 Count	1	0	1
	4 % within Typeprog/stationary	0.5%	0.0%	0.5%
Total	Count	186	14	200
	% within Typeprog/stationary	100.0%	100.0%	100.0%

Table 25 graftinflammationday1 * DONARsite sup/IT

		DONAR site		Total
		SUPRATEMPORAL	INFRATEMPORAL	
Graft inflammation	0 Count	42	95	137
	0 % within DONARsite sup/IT	49.4%	82.6%	68.5%
	1 Count	29	13	42
	1 % within DONARsite sup/IT	34.1%	11.3%	21.0%
	2 Count	9	7	16
	2 % within DONARsite sup/IT	10.6%	6.1%	8.0%
	3 Count	4	0	4
	3 % within DONARsite sup/IT	4.7%	0.0%	2.0%
	4 Count	1	0	1
	4 % within DONARsite sup/IT	1.2%	0.0%	0.5%
Total	Count	85	115	200
	% within DONARsite sup/IT	100.0%	100.0%	100.0%

Table 26 graftinflammationday1 * hydrated/nonhydrated

		Graft hydration		Total
		HYDRATED	NON-HYDRATED	
Graft inflammation	0 Count	69	68	137
	0 % within hydrated/nonhydrated	71.1%	66.0%	68.5%
	1 Count	21	21	42
	1 % within hydrated/nonhydrated	21.6%	20.4%	21.0%
	2 Count	7	9	16
	2 % within hydrated/nonhydrated	7.2%	8.7%	8.0%
	3 Count	0	4	4

	% within hydrated/nonhydrated	0.0%	3.9%	2.0%
4	Count	0	1	1
	% within hydrated/nonhydrated	0.0%	1.0%	0.5%
Total	Count	97	103	200
	% within hydrated/nonhydrated	100.0%	100.0%	100.0%

Table 27 graftinflammationday1 * graftsizesame/>1mm

		Graft size		Total
		SAME	1MM MORE WUTH TUCKING	
Graft inflammation	0 Count	76	61	137
	% within graftsizesame/>1mm	65.5%	72.6%	68.5%
	1 Count	27	15	42
	% within graftsizesame/>1mm	23.3%	17.9%	21.0%
	2 Count	13	3	16
	% within graftsizesame/>1mm	11.2%	3.6%	8.0%
	3 Count	0	4	4
	% within graftsizesame/>1mm	0.0%	4.8%	2.0%
	4 Count	0	1	1
	% within graftsizesame/>1mm	0.0%	1.2%	0.5%
Total	Count	116	84	200
	% within graftsizesame/>1mm	100.0%	100.0%	100.0%

Table 28 **graftinflammationday1 * recepientbedbleeding**

		Recepien bed bleeding			Total
		MILD	MODERATE	SEVERE	
Graft inflammation	0 Count	23	48	28	99
	% within recepientbedbleeding	34.8%	70.6%	42.2%	49.5%
	1 Count	26	16	10	52
	% within recepientbedbleeding	39.4%	23.5%	15.2%	26.0%
	2 Count	12	4	20	36
	% within recepientbedbleeding	18.2%	5.9%	30.0%	18.0%
	3 Count	4	0	5	9
	% within recepientbedbleeding	3.2%	0.0%	7.6%	4.5%
	4 Count	1	0	3	4
	% within recepientbedbleeding	0.8%	0.0%	4.5%	2%
Total	Count	66	68	66	200
	% within recepientbedbleeding	100.0%	100.0%	100.0%	100.0%

Table 29 graftinflammationday1 * AnaesthesiaPBB/topical

			Anaesthesia		Total
			PBB	TOPICAL	
Graft inflammation	0	Count	85	52	137
		% within AnaesthesiaPBB/topical	63.9%	77.6%	68.5%
	1	Count	32	10	42
		% within AnaesthesiaPBB/topical	24.1%	14.9%	21.0%
	2	Count	15	1	16
		% within AnaesthesiaPBB/topical	11.3%	1.5%	8.0%
	3	Count	0	4	4
		% within AnaesthesiaPBB/topical	0.0%	6.0%	2.0%
	4	Count	1	0	1
		% within AnaesthesiaPBB/topical	0.8%	0.0%	0.5%
Total		Count	133	67	200
		% within AnaesthesiaPBB/topical	100.0%	100.0%	100.0%

Table 30 graftinflammationday1 * durationofpatching21hrs/4hrs

		durationofpatching21hrs/4hrs		Total
		21 HRS	4 HRS	
graftinflammationday1	0 Count	124	13	137
	% within durationofpatching21hrs/4hrs	70.5%	54.2%	68.5%
	1 Count	33	9	42
	% within durationofpatching21hrs/4hrs	18.8%	37.5%	21.0%

	Count	14	2	16
2	% within durationofpatching21hrs/4hrs	8.0%	8.3%	8.0%
	Count	4	0	4
3	% within durationofpatching21hrs/4hrs	2.3%	0.0%	2.0%
	Count	1	0	1
4	% within durationofpatching21hrs/4hrs	0.6%	0.0%	0.5%
	Count	176	24	200
Total	% within durationofpatching21hrs/4hrs	100.0%	100.0%	100.0%

Analysis of recurrence Recurrence was seen in 3 cases(1.5%) at the end of 6months. All the 3 cases were non-hypertensive, non-diabetic patients with progressive pterygium, with mild recipient bed bleeding with graft size of >1mm with tucking under peribulbar block Among the 3 cases 1 was in the age group of 26-35yrs, 2 were in 36-45yrs, graft was taken from superotemporal quadrant in 2(66.6%)cases ,inferotemporal quadrant in 1(33.3%).case and had hydrated graft in 2(66.6%)cases ,non-hydrated graft in 1(33.3%).

Table 31

Studies	Kulthe et al	Rupali Venukumar Rangu et al	Singh S P et al	Our study
Sample size	79	20	50	200
Patient comfort	Not assessed	Not assessed	Not assessed	123(61.5%)
Graft stability	76 (96.3%)	3(15%)	5 (11.1%)	178(89%)
Graft inflammation	Not assessed	2 (10%)	Not assessed	21(10.5%)
Recurrence	Nil (0%)	Nil (0%)	1 (2.2%)	3cases (1.5%)
Other post op complications	Not assessed	Nil	Granuloma 1 (2.2%)	Granuloma 2 cases (1%)

Analysis of other postop complications Other postop complication like only granuloma was seen in 2 cases(1%). Both the cases were non hypertensive, non-diabetic patients with progressive pterygium, with mild recipient bed bleeding with hydrated graft under peribulbar block. Among them, 1 was in the age group of 26-35yrs, 1 was in 36-45yrs , graft taken from superotemporal quadrant in 1(50%)case , inferotemporal quadrant 1(50%)case and graft size of >1mm with tucking 1case(50%) and graft size same as bare area 1(50%)case.

IV. Discussion

Pterygium excision with conjuctivolimbal autograft is very efficient and widely accepted method of management for pterygium. Sutureless glue free conjunctivolimbal autograft is most economical and effective modality of management. However, there are various factors modifying the outcome of the surgery. The various factors could be Age, Diabetes, Hypertension, Types of pterygium – Progressive/Stationary, Type of anesthesia – Topical/Peribulbar block, Site of donor conjunctiva, Donor conjunctiva – Hydrated, Non hydrated, Recipient bed bleeding, Graft-size , Duration of post operative patching the eyes.

A study by Singh S P et al[5] studied the clinical outcome of sutureless and glue-free conjunctival autograft in 50 eyes. Recurrence was seen in one eye (2.2%) at one year. Graft retraction on conjunctival side occurred in 5 eyes (11.1%). One conjunctival granuloma (2.2%).[5] Where as we found 66.5% had a good graft stability with 22.5% had a graft retraction on one side, remaining had more than one side retraction and only 2 (1%)patients had granuloma. A study by Kulthe et al[7] on total of 79 eyes of 74 patients found Medial edge recession of the graft was seen in one case (1.2%) ,whereas two cases (2.5%) had lost graft on the first post-operative day with no recurrences at the end of 6 months.[7] However in our study, 2 (1%) patients had grade 4 graft stability i.e, all four sides of graft completely displaced from the bed on postop day1, later these grafts were repositioned and sutured. We found Recurrence was seen in 3(1.5%) cases at the end of 6 months.Rupali Venukumar Rangu et al[9] study in 20 eyes with primary nasal pterygium found total graft dehiscence occurred in 2 eyes(10%) graft retraction in 1 eye (5%),and graft oedema noted in 2 eyes(10%). None of the cases had any recurrence.[9] In our study , graft inflammation of more than grade 2 was seen in 21(10.5%) cases in postop day1, which resolved with hourly antibiotic-steroid drops and analgesics.(table31)

In our study, we found that Patient comfort was good in nonhypertensives(61.1%), non-diabetics(96.7%), progressive type(61.89%) with graft taken from inferotemporal quadrant (71.3%), non-hydrated graft(68.04%), same sized graft(58.62%) and with mild recipient bed bleeding(95.4%), with 21hours of patching(66.5%) .Graft stability was better in non-hypertensives (88.54%), non-diabetics(66.54%), under peribulbar block(60.9%), nonhydrated grafts (92.7%), same sized graft(89.7%) , severe recipient bed bleeding(100%), 21hours of patching(89.3%).Graft inflammation was minimal in non-hypertensives(66.9%), non-diabetics(68.6%), progressive type(69.4%), peribulbar block(70.5%) , graft taken from inferotemporal quadrant (82.6%), hydrated grafts(71.1%), graft size >1mm of bare sclera(72.6%), severe recipient bed bleeding(70.6%). Recurrence was seen in 3(1.5%) cases at the end of 6 months. Granuloma was seen in 2(1%) cases at the end of 6months.

Sutureless glue free conjunctivolimbal autograft pterygium surgery under peribulbar block with graft taken from inferotemporal quadrant, nonhydrated grafts, with moderate to severe recipient bed bleeding, with graft size same as bare area,with 21hrs of patching had good outcome. There is no significant difference in the outcome in terms of age, hypertension, diabetes and type of pterygium.

References:

[1]. Farjo Q A, Sugar A. Pterygium and Conjunctival Degenerations, Yanoff &Duker. Ophthalmology, Mosby, An Imprint of Elsevier; 2008; 3:249.

[2]. Sutphin J E, Reza Dana M, Florakis G J, Hammersmith K, Reidy J J, Lopatynsky M. External Disease and Cornea. American Academy Of Ophthalmology, 2007-2008; Section 8:366,429-432.

[3]. Ashok Sharma,Hans Raj, and Amit-Vikram Raina ;Sutureless and Glue-free Versus Sutures for Limbal Conjunctival Autografting in Primary Pterygium surgery;A Prospective Comparative Study.J Clin-Diagn Res-2015 Nov;9(11),Published online 2015 Nov 1

[4]. Malik KP, Goel R, Gutpa A, Gupta SK, Kamal S, Mallik VK, Singh S;Efficacy of sutureless and glue free limbalconjunctivalautograft for primary pterygium surgery; Nepal J Ophthalmol. 2012 Jul; 4(8):230-5.

[5]. Singh S P, Chakma A K,Phuritsabam B, Laishram M, Maibam N, Marina A. "Sutureless and Glue Free Conjunctivo-Limbal Autograft in Primary Pterygium Surgery: Outcome and Recurrence Rate". Journal of Evolution of Medical and Dental Sciences 2014; 3(15):4029-4035.

[6]. D de wit,Athanasiadis, A Sharma and J Moore,Sutureless and glue free conjunctival autograft in pterygium surgery;a case series.Eye (2010)24,1474-1477;doi;10.1038/eye,2010,75;Published online 4 June 2010 i;

[7]. 10.1038/eye,2010,75;Published online 4 June 2010

[8]. Kulthe,Amit P Bhosale,Prachi U Patil,Is the surgical technique of a sutureless and gluefree conjunctivolimbal auto-graft after pterygium excision complication free?.Int J Opththal.2015;8(3):308-312

[9]. Sooraj Singh Kubrey et al ,Conjunctival Autograft Fixation With Protein Coagulation And Blood Fibrin as Tissue Adhesive in Pterygium Surgery.DOI 10.14260/ jemds/ 2014/2316

[10]. Rupali Venukumar Rangu,et al ,Study of Sutureless and Glue-Free Conjunctival Autograft.International Journal of Recent Trends in Science and Technology,ISSN 2277-2812- E ISSN 2249-8109,Vol-10.Issue -3,2014 pp 480-482

[11]. Gunjan Rathi,Jayesh Sadhu,et al,Pterygium Surgery;Sutureless glue free conjunctival autografting.Int J Res Med.2015; 4 (1) 125-128

[12]. Huerva V, March A, Martinez-Alonso M, Muniesa MJ, Sanchez C. Cirurgia de pterígio por meio de transplante autólogo de conjuntiva: acompanhamento a longo prazo. Arquivos Brasileiros de Oftalmologia. 2012;75(4):251-5.

[13]. Wang W, Rong TH, Zhang L, Jiang WQ, Xu GC, Huang HQ, He YJ, Guan ZZ. Multivariate survival analysis for 423 patients with non-small cell lung cancer. Ai zheng= Aizheng= Chinese journal of cancer. 2003 Jun;22(6):624-8.

[14]. Veluri H, Alla S, Potti S, Khatib NL. Long Term Follow Up Results of Pterygium Excision with Conjunctival Autograft using Fibrin Glue: A Retrospective Study. The Official Scientific Journal of Delhi Ophthalmological Society. 2019 May 8;29(4):35-8.

[15]. 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. Journal of Clinical Ophthalmology and Research. 2016 Sep 1;4(3):143.

[16]. Kumar S, Singh R. Pterygium excision and conjunctival autograft: A comparative study of techniques. Oman journal of ophthalmology. 2018 May;11(2):124.

[17]. Bhatia J, Varghese M, Narayanadas B, Bhatia A. Cut-and-place technique of pterygium excision with autograft without using sutures or glue: Our experience. Oman journal of ophthalmology. 2017 May;10(2):81.

[18]. de Wit D, Athanasiadis I, Sharma A, Moore J. Sutureless and glue-free conjunctival autograft in pterygium surgery: a case series. Eye. 2010 Sep;24(9):1474.

[19]. Hirst LW. Recurrent pterygium surgery using pterygium extended removal followed by extended conjunctival transplant. Recurrence rate and cosmesis. Ophthalmology. 2009;116(7):1278-86.

[20]. Rubin MR, Dantas PE, Nishiwaki-Dantas MC, Felberg S. Efficacy of fibrin tissue adhesive in the attachment of autogenous conjuntival graft on primary pterygium surgery. Arq Bras Oftalmol. 2011;74(2):123-6. [Links]

[21]. 28. Pan HW, Zhong JX, Jing CX. Comparison of fibrin glue versus suture for conjunctival autografting in pterygium surgery: a meta-analysis. Ophthalmology. 2011; 118(6):1049-54.

Fig2

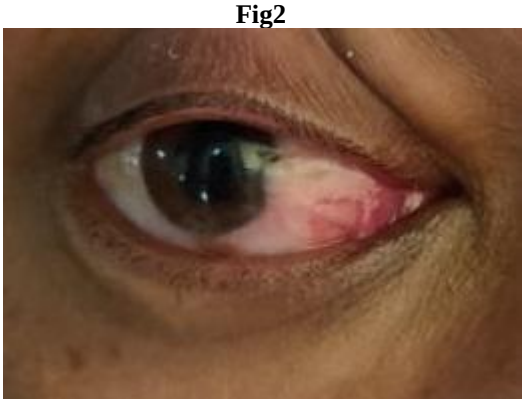


Fig3

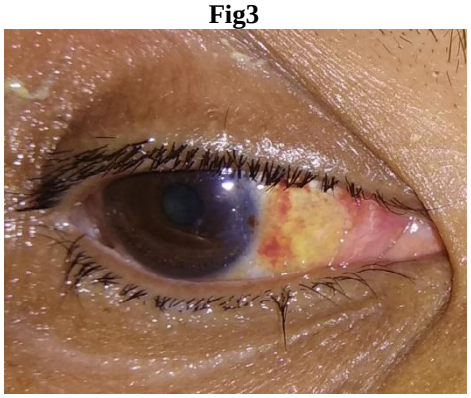
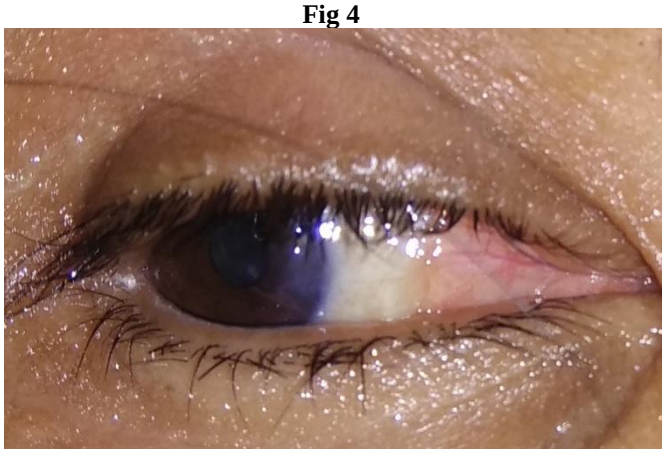


Fig 4



Legends:
Fig 2: progressive nasal pterygium
Fig 3 : sutureless gluefree conjunctival autograft postop day1
Fig 4 : sutureless gluefree conjunctival autograft postop 6weeks

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