

## Astigmatic Correction in Sutured Vs Sutureless Glue free Conjunctival Autograft for Pterygium Surgery



### Medical Science

**KEYWORDS :** Pterygium, pterygium surgery, keratometry, Astigmatism

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### ABSTRACT

**Purpose:** To compare and evaluate the efficacy of correction of astigmatism in sutured Vs sutureless glue free conjunctival autograft in pterygium surgery. **Methods:** Prospective observational study done in 24 eyes. Excision of the pterygium done under peribulbar anaesthesia. In 12 eyes (A) sutureless glue free conjunctival autograft and in the rest 12 eyes (B) sutured conjunctival autograft was performed. K readings are noted pre and postoperatively. **Results:** High statistically significant difference was noted between pre and post op values of K1 in both groups (A  $p=0.004$ ) (B  $p=0.009$ ), change in average K postoperatively was significant in both groups (A  $p=0.004$ ) (B  $p=0.015$ ). **Conclusions:** There was no statistically significant difference in correcting astigmatism between the two groups. Sutureless and glue free conjunctival autograft technique is equally easy, safe, effective method with better acceptance as patient comfort is more and cost of surgery is low.

Pterygium is a degenerative condition of the sub conjunctival tissue which proliferates as vascularized granulation tissue to invade the cornea, the whole being covered by conjunctival epithelium.

Inter palpebral fissure is the most common site of pterygium, usually on the nasal side. It is a common ocular disease, mostly in tropical and subtropical areas. Environmental factors influences growth of pterygium<sup>(1,2)</sup>.

Simple excision (bare sclera technique) is a commonly done method of treatment but associated with high recurrence rates ranging from 24-89%<sup>(1,3)</sup>. Hence several adjunctive measures like post op therapy with mitomycin C and Beta irradiation or conjunctival autograft fixed by sutures, fibrin glue or sutureless and glue free method is done<sup>(1)</sup>.

The progression of a pterygium onto the cornea can lead to significant corneal distortion and development of large amount of corneal astigmatism. This abnormality has been measured by keratometry. In this study, an attempt was made to assess the effect of pterygium excision and conjunctival autograft on the pterygium induced astigmatism, and the difference in the amount of astigmatism correction among the two different techniques of conjunctival autograft.

#### Materials and methods:

Twenty four eyes with primary pterygia were studied before and after surgery. Those patients with rapid growth of pterygium encroaching pupillary area and with blurred vision from induced astigmatism were included in the study. The exclusion criteria for the study were those with atrophic pterygium, pseudo pterygium, ocular surface pathology, infection, dry eye, previous ocular surgery except pterygium surgery.

All the patients recruited for the study were thoroughly evaluated with detailed history, visual acuity, refraction, complete ophthalmic examination with slit lamp, keratometry and funduscopy.

Pterygium grading was done as follows-T1 (atrophic: episcleral vessels under the body of the pterygium-not obscured and clearly distinguished), T3 (fleshy: episcleral vessels totally obscured) and T2 (intermediate: all other pterygia not falling into these 2 grades) Based on width of the pterygia at the limbus, they were divided into two groups: wide base (= 5mm) and narrow base (<5 mm)<sup>(2,4)</sup>. An informed consent was taken from all the patients and they were considered into 2 groups: Group -A:

Sutureless, gluefree conjunctival autograft surgery performed in Government Wenlock Hospital. Group -B: Conjunctival autograft surgery with sutures operated in KMC Attavar.

The pterygium was excised with initial detachment of the its head from the cornea using a Tooke's corneal knife. The body of the pterygium was separated from the limbus and from the overlying conjunctiva in a smooth clear plane using blunt and sharp dissection with Westcott's scissors. Subsequently, the sub conjunctival pterygium tissue along with the thickened segment of conjunctiva and adjacent Tenon's capsule were excised leaving bare sclera. Then the size of bare sclera was measured with calipers.

The conjunctival autograft 2 mm larger in width and length was harvested from either superior or superotemporal quadrant of bulbar conjunctiva reaching the limbus so as to include limbal stem cells. Forceps was used to gently slide the graft to the recipient bed with the epithelial side up and keeping the limbal edge towards the limbus.

In **group A:** Hemostasis was allowed to occur spontaneously, so as to provide autologous fibrin which glues the conjunctival autograft naturally in position. The graft was held in position for 10 min by application of gentle pressure over the graft with fine non-toothed forceps. The eye was bandaged for 24 h.

In **group B:** The graft was sutured in position with 8/0 Ethilon or 7/0 Vicryl. First, the two limbal corners were sutured into the episclera and then into the conjunctiva keeping the limbal edge of the graft on gentle stretch. Then, the posterior corners of the graft were sutured to the bulbar conjunctiva. Additional sutures were placed to close the wound edges.

Post operatively, antibiotics, steroids (tapering done) and lubricating drops were prescribed for 6 weeks. All patients were assessed on the first postoperative day. Visual acuity and keratometry were repeated on day 1 post op.

Students paired and unpaired t test for quantitative data while proportion test or chi square test for qualitative data analysis was performed using SPSS for windows, version 17.0. P values smaller than 0.05 were considered significant.

#### Results:

A total number of 24 pterygia were operated, among which sutureless glue free technique was used to fix conjunctival autograft in 12 cases of group A, while conjunctival autograft was

sutured in the other 12 cases of group B.

Age distribution ranged from 21-70 years with maximum number of cases noted in 31-40 age group (33.33%) in both group A and B.

Total number of males who underwent surgery were 14 (58.3%) and females were 10 (41.7%). In group A, there were 8 (66.7%) males and 4 (33.3%) females while in group B, there were 6 (50%) males and 6 (50%) females.

Among the cases operated, 14 (58.3%) had pterygium in both eye while the remaining 10 had pterygium in one eye at the time of presentation, of which 5 (20.8%) had in the RE and the other 5 (20.8%) in the LE. Equal number of cases were operated for RE (50%) as well as LE (50%) in both groups.

9 patients (37.5%) with grade 2 narrow base pterygium were the major proportion of cases which got operated, followed by 7 patients (29.2%) of grade 2 broad base pterygium.

Statistically significant difference was noted between pre op K1 and post op K1 in both groups. In group A  $p = 0.004$  while in group B  $p = 0.009$  as shown in table 1 below.

Comparison between pre and post op amongst the same group. Table 1

Group		Paired Differences		t	p
		Mean	Std. Deviation		
Sutureless gluefree	Pre op K1 - Post op K1	-7.0833	.67279	-3.647	.004 hs
	Pre op K2 - Post op K2	-1.2500	.40592	-1.067	.309
	Pre op average K - Post op average K	-4.17083	.403256	-3.583	.004 hs
	Pre op Difference in K1 K2 - Post op Difference in K1 K2	.62500	.72692	2.978	.013 sig
Sutured	Pre op K1 - Post op K1	-7.0833	.77484	-3.167	.009 hs
	Pre op K2 - Post op K2	-.02083	.16714	-.432	.674
	Pre op average K - Post op average K	-3.322817	.389705	-2.870	.015 sig
	Pre op Difference in K1 K2 - Post op Difference in K1 K2	.72817	.75723	3.338	.007 hs

Change in average K postoperatively was highly significant in group A with  $p = 0.004$  and difference of K1 and K2 pre and postoperatively was also significant with  $p = 0.013$ .

In group B, significant change in average K was noted with  $p = 0.015$  and highly statistically significant difference of K1 and K2 pre and postoperative was noted with  $p = 0.007$ .

But when compared between the two groups, the change in average K and difference of K1 and K2 pre and postoperatively was not statistically significant.

Grade 3 broad base pterygium showed a mean of 3 +/- 0.35 D difference of K1 K2 preoperatively, followed by grade 2 broad base 1.39 +/- 0.59 D as shown in the above table 2.

Pre op Difference in K1 K2 and pterygium grade. Table 2

	N	Mean	Std. Deviation	Minimum	Maximum
2 narrow base	9	1.2500	.92702	.25	3.00
2 broad base	7	1.3929	.59261	.75	2.25
3 narrow base	6	1.0000	.44721	.25	1.50
3 broad base	2	3.0000	.35355	2.75	3.25

As shown in the table 3 below,

Pre and post op difference. Table 3

Pterygium grade		Paired Differences		t	p
		Mean	Std. Deviation		
2 narrow base	Preop Difference in K1 K2 - Post op Difference in K1 K2	.694	.808	2.579	.033sig
	Preop Difference in K1 K2 - Post op Difference in K1 K2	.643	.566	3.057	.022vsig
3 narrow base	Preop Difference in K1 K2 - Post op Difference in K1 K2	.250	.274	2.236	.076
	Preop Difference in K1 K2 - Post op Difference in K1 K2	2.000	.354	8.000	.079

Statistically significant correction of astigmatism was noted in Grade 2 broad base with  $p = 0.022$  followed by grade 2 narrow base with  $p = 0.033$ .

**Discussion:**

Pterygium-induced astigmatism can lead to visual complaints. Several mechanisms have been suggested to explain the induced astigmatism which include (i) pooling of the tear film at the leading edge of the pterygium, and (ii) mechanical traction exerted by the pterygium on cornea. This abnormality has been measured by keratometry (5).

Grade 3 broad base pterygium has shown high degree of pterygium induced astigmatism followed by grade 2 broad base in this study.

According to a study by Sejal Maheshwari, the astigmatism decreased significantly following pterygium excision (5). Similar results were noted in this study where the mean value of astigmatism in group A was 1.375 +/- 0.86 D which decreased by

0.625 +/- 0.726 D following surgery and was statistically significant. In group B, the mean value of astigmatism was 1.375 +/- 0.869 D which decreased by 0.729 +/- 0.757 D following surgery and was highly significant. Also significant correction of astigmatism was noted in grade 2 broad base and narrow base pterygium.

However, there was no statistically significant difference in the decrease of astigmatic error between the two groups in this study. This is in accordance with the study conducted by Rana Altan-Yaycioglu et al, which showed no difference in the postoperative astigmatic changes between different surgical techniques of pterygium excision (6).

Small sample size is the main limitation of this study.

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