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Original articles

Efficacy of lid everting suture in the management of involutional lower eyelid entropion using 4-0 silk versus 4-0 chromic catgut

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Abstract

Background: Involutional lower eyelid entropion is a common ophthalmic condition requiring surgical correction.

Objective: To compare the efficacy of lid everting sutures in the management of involutional lower lid entropion using 4-0 silk versus 4-0 chromic catgut.

Materials and methods: Fifty eyes with involutional lower eyelid entropion were enrolled into the study and divided randomly into two groups, A and B. Group A underwent lid everting suture with 4-0 chromic catgut and group B with 4-0 silk. The parameters assessed were pre- and post-operative lower lid excursion (LLE) and horizontal lid laxity (HLL).

Statistical analysis: Data were plotted in the excel spread sheet and analyzed using SPSS 11.0 software program. The difference between the two groups was compared using Chi square test and unpaired t test.

Results: While comparing the pre-operative and post-operative changes of HLL within the two groups separately, there was 63% reduction of HLL in group A (p=0.001) and 68% reduction (p=0.001) in group B.

In group A, there was 48.2% improvement in LLE and in group B 52% postoperatively (p=0.001). The success rate in each group was 92%. The cost of surgery in group A was higher than that in group B (p=0.003).

Conclusion: Lid everting suture by 4-0 silk is as effective as 4-0 chromic catgut. The cost of lid everting suture by 4-0 catgut is higher than that of 4-0 silk. The silk suture can be recommended for correction of lower lid involutional entropion in a country with low socioeconomic status.

Key words: involutional entropion, lid laxity, lid excursion, lid everting suture

Introduction

Involutional entropion is one of the most commonly encountered eyelid malpositions (Wright et al 1999). The lower tarsus has been shown to degenerate with ageing (Benger and Much, 1989). Significant decrease in horizontal and vertical dimensions occur gradually, already detectable after age 40. Past the 6th or 7th decade, roughly a 25% reduction in height can be expected.

Histologically, the meibomian glands decrease in size and number, and degeneration of connective tissue and fragmentation of the elastic fibres occur, resulting in significant thinning.

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A variable combination of the following factors have been proposed to explain turning inward of the lower lid. These are as follows.

1. Horizontal lid laxity due to weakening of the lateral and medial attachment of the tarsus to the orbital rim (Benger and Much, 1989; Bick, 1966; Wesley and Collins, 1983; Schaefer, 1983; Jones, 1960; Jones et al 1972).
2. Vertical lid laxity, caused by attenuation, dehiscence or disinsertion of the lower eye lid retractors or orbital rim (Jones, 1960; Jones et al 1972).
3. Age-related enophthalmos caused by partial atrophy of orbital rim (Kersten et al 1997).
4. Migration of the preseptal orbicularis muscle to override the pretarsal orbicularis muscle (Collin and Rathbun, 1978).

The underlying mechanism of this overriding is still speculative, and it has been found in age-matched people as well.

As a rule, none of these factors alone will produce involutional lower lid entropion. In most cases, they coexist to some degree. Therefore, surgical planning should address each factor separately, except for enophthalmos.

Treatment of involutional entropion

Involutional entropion can be treated in many different ways. They are given below.

Medical management

Emollients, bandage contact lens or taping of the eyelids may alleviate the symptoms of entropion. A sticky substance such as tincture of benzoic and tape applied near the orbital rim may correct entropion (Lyon & Dortzbach, 1994). They are the most simple forms of treatment and offer cure for only a short time (Wright et al 1999).

Surgical management

Surgical management can be categorized into the following two groups.

a) Lid everting suture technique of Quickert and Rathbun (Rathbun and Hornblas, 1988, Quickert et al 1983). This is a simple, successful, long-lasting and cost-effective procedure. It can be done under local anesthesia in the office or bedside in bed-ridden patients. The suture used is 4-0 chromic catgut as it causes more inflammation than polyglactin material (Vicryl or Bisorb).

The success rate of this technique is 85% (Rathbun and Hornblas, 1988).

Incisional surgical techniques

The commonly described surgical techniques are as follows.

a. Combined anterior approach: This is the "direct repair" in which the lower lid retractors are advanced, tightened and reattached to the tarsus (Wesley and Collins, 1983).
b. Orbicularis oculi muscle transposition with or without excision (Nowinski, 1991; Lemke and Della 1990).
c. Cobined posterior (transconjunctival) approach (Dresner and Karesh, 1993).
d. Weis Procedure.
e. Modified Wheeler's operation.

Management of involutional entropion using lid everting suture is a simple, successful, long-lasting and cost-effective procedure and generally free from local complications observed in incisional surgery. This study was designed to evaluate the efficacy and success rate of lid everting sutures for correction of lower lid involutional entropion.

Materials and methods

Fifty eyes with involutional entropion were enrolled into the study, out of which 25 were in group A and 25 in group B. Group A underwent lid everting suture with 4-0 chromic catgut and group B with 4-0 silk. Randomization was done using a random number table. Inclusion criteria were all patients aged 55 years or more with involutional entropion and exclusion criteria were any patients aged below 55 years, entropion with occluded or stenotic meibomian ducts, associated scarring of conjunctiva or symblepharon and involutional entropion associated with other types of entropion. The parameters and variables assessed were pre- and post-operative lower lid excursion and horizontal lid laxity, complications and total cost in each group.

In all patients, baseline demographic data such as name,

age, gender and history of diabetes were recorded. The best-corrected visual acuity was taken with Snellen's chart in the form of logMAR.

Horizontal lid laxity was assessed by Snapback test which was performed by gently holding the eyelid and pulling anteriorly. The gap between the mid point of the posterior lower lid margin and the mid point of the inferior limbus was measured with Castroviejo caliper.

LLE was estimated by measuring the vertical excursion in mm of the centre of the lower lid margin between extreme up gaze and down gaze.

All the patients were evaluated the next day, after 3 weeks and after 3 months. Ocular assessment included estimation of lower lid retractor functions and horizontal lid laxity, any complications, visual acuity and slit-lamp examination.

If ectropion existed at the end of each follow up period, gentle lid massage twice daily was advised.

Statistics

Data analysis was carried out using SPSS 11.0 Software program. The two groups were compared using Chi square test. Preoperative and postoperative values of horizontal lid laxity and lower lid excursion were compared using paired t test. A P value of less than 0.05 was taken as significant.

Results

In both groups, the age of the patients ranged from 55-90 years. Most of the patients were in between 55-64 years of age (34% of all patients). The mean age in years in group A was 68.20±11.05SD, whereas in group B, it was 68.12±8.23SD.

Both the groups were comparable for age (p-value 0.97).

In our study, 7 patients were male and 18 patients female in group A. In group B, 8 patients were male and 17 patients were female. While comparing the groups in terms of gender, they were comparable (p-value 1.00).

In both groups, most patients had visual acuity between log MAR+0.3(6/12) to log MAR+0.6(6/24). Overall visual acuity in both groups was not comparable (p-value 0.003).

The difference of visual acuity in the two groups was due to presence of corneal opacity, cataract and age related macular degeneration. The mean pre-operative lower lid excursion in group A was 2.8±1SD mm while in group B 2.68±0.68SD mm. Pre-operative LLE in both groups was comparable (p value 0.64)

The mean post-operative HLL in group A on the 1st post-operative day, after 3wks, and after 3months were 7.08±2.12mm, 6.32±1.82mm and 7.08±2.04mm respectively, whereas the mean HLL in Group B on the 1st post-operative day, after 3weeks and after 3months were 6.32±1.45mm, 6.62±1.55mm and 7.6±1.12mm respectively.

There were no statistically significant differences in the two groups in terms of post-operative horizontal lid laxity on the first post-operative day (p=0.35), after 3 weeks(p=0.5) and after 3 months (p=0.38).

While comparing the pre-operative and post-operative changes of HLL in two groups separately, there was 63% reduction of HLL in group A (p=0.001) and 68% reduction (p=0.001) in group B (p=0.001).

In both groups, a difference in pre-operative and post-operative HLL was statistically significant.

Table 1

Pre-operative horizontal lid laxity in mm of patients with involutional entropion

Group	No. of patients	Mean(mm)	±SD
A	25	11.4	1.53
B	25	10.24	2.01
p value	0.5		

Table 2

Post-operative mean ± SD HLL in mm of patients with involutional entropion

Group	Day 1	3 weeks	3 months
A	7.08±2.12	6.32±1.82	7.08±2.04
B	6.51±1.45	6.64±1.55	7.6±1.12
p value	0.35	0.5	0.38

Group A-Lid everting suture by 4-0 chromic catgut.
Group B-Lid everting suture by 4-0 Silk.

Table 3

Pre-op and post-op HLL level and reduction in mm of patients with involutional entropion

Group	Mean ± SD HLL in mm		Reduction	P value
	Pre-op	Post-op		
A	11.4±1.53	6.83±1.98	63%	0.001
B	1O.24±2.01	6.92±1.37	68%	0.001

HLL - Horizontal lid laxity.
Group A-Lid everting suture by 4-0 chromic catgut.
Group B-Lid everting suture by 4-0 silk.

Post-operative lower lid excursion

In group A, post-operative LLE on the first postoperative day, after 3 weeks and after 3 months were 4.80±1.66 mm, 4.92±1.15 mm and 4.52±1.48 mm respectively.

In group B, post-operative LLE on the 1st postoperative day, after 3 weeks and after 3 months were 5±0.81 mm, 5.12±0.8 mm and 4.84±1.25 mm respectively. The postoperative improvement in LLE were comparable in both groups in each follow up.

While comparing the preoperative and postoperative LLE in each group, in group A, there was 48.2% improvement in LLE which is statistically significant; (p value 0.001) and in group B, there was 52% improvement in LLE which is statistically significant (p = 0.001).

Table 4

Preoperative lower lid excursion in mm of patients with involutional entropion

Group	No of patients	LLE(mean) in mm	±SD
A	25	2.8	1
B	25	2.68	0.68
P value	0.624		

Table 5

Post-operative mean ± SD LLE in mm of patients with involutional entropion

Group	Day1	3 wks	3 months
A	4.80±1.66	4.92±1.15	4.52±1.48
B	5±0.81	5.12±0.8	4.84±1.25
P value	0.41	0.49	0.45

Group A-Lid everting suture by 4-0 chromic catgut.
Group B-Lid everting suture by 4-0 Silk.

Table 6

Surgical outcome in two groups

Group	Total	Success	Recurrence
A	25	23	2
B	25	23	2
P value	0.71		

The total cost of surgery in group A was 180 rupees per patient and in group B, 142 rupees per patient. The cost of surgery in group A was significantly higher than that in group B (p-value 0.003).

In each of the two groups, recurrence occurred in 2 cases. No other complications occurred in either group.

Discussion

Lid everting suture in the correction of primary or recurrent lower lid involutional entropion is a simple, successful, long lasting and cost effective procedure.

In this study, the age of patients ranged from 55-90 years. In both groups, the maximum number of patients was in the age group 55-64 years. Though involutional entropion increases with age, the maximum number of patients between the age group of 55-64 years was explainable by the fact that in our part of the world, life expectancy is less and very old people seek less medical attention for their health problems than do younger patients.

Wright et al did a study on efficacy of lid evertng suture in involutional entropion. The age of patients was between 53-90 years with the mean age of 70 years. The maximum number of patients were between the ages of 64-74 years.

In our study population, female patients (68%) outnumbered the male patients (32%).

Wright M et al reported that involutional entropion is more common in females (60%) which was comparable with the present study in terms of gender (Wright et al 1999).

In group A, the right eye was involved in 9 patients and the left eye in 15 patients, whereas in group B, right eye was involved in 10 patients and the left eye in 14 patients.

The left eye was predominantly involved in both cases. Out of 50 patients, 2 patients had bilateral involvement. Wright M et al showed unilateral involvement in 54 patients out of 57 patients (Wright et al 1999).

Altieri M et al showed unilateral involvement in all patients enrolled in the study (Meadows et al 1999).

The mean pre-operative HLL in group A was 11.4 ± 1.53 mm, whereas in group B, it was 10.2 ± 2.02 mm.

Pre-operative HLL in both groups were comparable (p=0.5), which could be due to the fact that the two groups had similar age distribution.

Benger and Musch (1989) demonstrated a significant increase in horizontal lid laxity in patients in whom the entropion was present for more than 6 weeks. The mean horizontal lid laxity was 9.2 mm in their study. They explained this increase in HLL due to weakening of the lateral and medial attachments of the tarsus to the orbital rim.

In our study the mean preoperative lower lid excursion in group A was 2.8±1 mm, whereas in group B it was 2.68±0.68 mm.

The LLE in both the groups was comparable.

The decreased LLE in both groups might be due to attenuation, dehiscence or disinsertion of the lower lid retractors or orbital rim.

The mean post operative HLL on the 1st post-operative day, after 3 wks, and after 3 months was 7.08±2.12 mm, 6.32±1.82 mm and 7.08±2.04 mm respectively, whereas the mean HLL in Group B on the 1st post-operative day, after 3 weeks and after 3 months was 6.32±1.45 mm, 6.62±1.55 mm and 7.6±1.12 mm respectively.

There was no statistically significant difference in the two groups in terms of post-operative change of horizontal lid laxity (p-value 0.38).

While comparing the pre-operative and post-operative changes of HLL in the two groups separately, there was 63% reduction of HLL in group A (P-value 0.001) and 68% reduction in group B.

Lyon and Dortzbach, (1994) also described a subjective decrease in lower lid horizontal lid laxity after lid everting suture in involutoional entropion.

In group A, post-operative LLE on the 1st day, after 3 weeks and after 3 months was 4.80±1.66 mm, 4.92±1.15 mm and 4.52 ± 1.48 mm respectively. In group B, post-operative LLE on the 1st day, after 3 weeks and after 3 months was 5±0.81 mm, 5.12±0.8 mm and 4.84±1.25 mm respectively.

Here we see that the post-operative improvement in LLE was comparable in both groups in each follow-up.

While comparing the preoperative and postoperative LLE in each group, in group A, there was 48.2% improvement in LLE, which was statistically significant (p-value 0.001). In group B, there was 52% improvement in LLE (p = 0.001)

The improvement of LLE could be due to the fact that everting sutures plicate the attenuated lid retractors and transfer their pull to the anterior surface of the tarsal plate. They also create a horizontal barrier to the upward migration of the preseptal orbicularis. The permanence of this procedure depends on the creation of a fibrotic scar along the suture tracks.

Lyon and Dortzbach, (1994) described a subjective increase in lower lid excursion after a Quickert's entropion repair and interpreted this as evidence of an improvement in lower lid retractor function.

Altieri M et al (1999) also described improvement in lower lid excursion following everting suture technique in involutional entropion (p = <0.005). In both groups, during 3 months of follow-up, entropion occurred in 2 cases (8%of total cases). Wright et al (1999) showed 15% recurrence in 18 months follow-up. This difference could be due to the difference in follow-up period. The total cost of surgery in group A was 180 rupees per patient and in group B it was 142 rupees per patient. The cost of surgery in group A was higher than that in group B (p-value 0.003) which was statistically significant.

In each of the two groups, recurrence occurred in 2 patients. No other complications occurred in either of the groups. There was no statistically significant difference in the two groups in terms of complications. Though literature showed that lid everting suture by 4-0 silk causes stitch granuloma (Lyon and Dortzbach, 1994) and should not be used, no such complications occurred with it in this study.

Conclusion: Lid everting suture by 4-0 silk is as effective as 4-0 chromic catgut. The cost of lid everting suture by 4-0 catgut is higher than that of 4-0 silk. The silk suture can be recommended for correction of lower lid involutional entropion in a country with low socioeconomic status.

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