

Upper lid crease approach for margin rotation in trichomatous cicatricial entropion without external sutures

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Abstract

Background: Trichiasis is frequently caused by upper eyelid cicatricial entropion that results in scarring of the tarsus and an inward rotation of the lid margin.

Objectives: The aim of the present study is to describe the use of lid crease incision for upper eyelid margin rotation in cicatricial entropion combining internal traction on the anterior lamella, tarsotomy, and tarsal overlap without external sutures.

Patients and methods: This is a prospective consecutive interventional analytical study that included 40 eyes of 20 patients with age ranging from 40 to 80 years with trichomatous upper eyelid entropion presenting to the outpatient clinic of "Qena" University Hospital, Group patients were randomly selected according to the inclusion criteria to undergo the transcutaneous margin rotation operation at Qena University Hospital & the surgery was explained to the patients. The study was approved by the Scientific and Ethical Committee at Faculty of Medicine, South Valley University

Results: The mean patients' age for was (56.0 ± 18.27) and a range of (40.0- 76.0) years, Among the 20 patients recruited, 9 (45%) were males and 11 (55%) were females, In our study, 20% of eyes among the TMR group underwent entropion correction and blepharoplasty for dermatochalasis in the same sitting. Out of 40 eyes in the study, 70% developed "grade II" and 30% developed "grade I" post operative lid margin position., Trichiasis recurrence rate was 10% in the studied group Recurrence was seen in four eyelids of four patients despite adequate post operative lid margin position.

Conclusion: Upper eyelid cicatricial trichomatous entropion can be effectively managed utilizing the TMR, with no significant incidence in entropion or trichiasis recurrence

Keywords: Upper lid crease; Marginal rotation; Upper eyelid cicatricial entropion; Internal traction on ant lamella; Tarsotomy; Tarsal overlap without external sutures.

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Introduction

Mostly Upper eyelid cicatricial entropion (UCE) (Polack et al., 2005) is a common cause of trichiasis which results from pathological process that causes scarring of the tarsus which leads to inward rotation of the lid margin. In many regions of world, trachoma is the most common cause of UCE. In western countries, UCE results from variety of other causes including chronic blepharitis, previous surgeries, pemphigus, chronic use OC topical glaucoma medications, and anophthalmic socket contraction (Kersten et al., 1992).

As trachoma is a blinding disease, there is a large amount of surgical techniques for correcting trachomatous UCE that can be related back to Chinese medical texts [Al-Rifai, 1998]

Trachoma, a neglected tropical disease, is the world's leading infectious cause of blindness (Ballen, 1964). Trachoma is caused by the obligate intracellular bacterium *C. trachomatis*. Recurrent episodes of conjunctival infection and the associated chronic inflammation caused by trachoma initiate a scarring process that ultimately leads to irreversible blindness. There is a worldwide effort underway trying to control blinding trachoma; this is led by the WHO with the Global Alliance for the Elimination of Blinding Trachoma (GET2020). safe strategy (World Health Assembly, 1998). The aim of the present study is to describe the use of lid crease incision for upper eyelid margin rotation in cicatricial entropion combining internal traction on the anterior lamella, tarsotomy, and tarsal overlap without external sutures

Patients and methods

This is a prospective consecutive interventional analytical study that included 40 eyes of 20 patients with age ranging from 40 to 80 years with trachomatous upper eyelid entropion presenting to the outpatient clinic of "Qena University hospital.

Inclusion criteria

a) Clinical evidence of trachoma according to

the clinical criteria recommended by the World Health Organization (Taylor et al., 1987).

b) Patients with cicatricial entropion.

Exclusion criteria

a) Patients with complications as total corneal opacity, corneal ulcer and others.

b) Patients with recurrent conditions.

Group patients were randomly selected according to the inclusion criteria to undergo the transcutaneous margin rotation operation at Qena University hospital & the surgery was explained to the patients.

The study was approved by the scientific and Ethical Committee at Faculty of Medicine, South Valley University.

Transcutaneous Tarsal Marginal Rotation (Operative Procedure):

- i. The eyelid crease is marked.
- ii. A 4-0 silk traction suture is inserted through the tarsal edge of the lid margin and a lid crease incision is created.
- iii. A pretarsal skin muscle flap is raised, exposing the whole tarsal plate and dissection under the pretarsal orbicularis muscle.
- iv. The lid is everted over a cotton-tipped applicator and held in position with the traction suture.
- v. Next, the lid is returned to its natural position. Three double-armed horizontal mattress 6-0 Vicryl sutures are then passed through half thickness of the central, medial, and lateral aspects of the proximal cut edge of the tarsus and attached to the orbicularis near the lash line. The non central sutures should be placed in a radial fashion similar to corneal transplant stitches. As the sutures are tied, the distal portion of the tarsus is advanced over the marginal tarsus, and the marginal orbicularis is pushed backward, rotating both lamellae of the lid margin outward.
- vi. The lid crease incision is closed with

interrupted 6-0 absorbable Vicryl sutures.

The mean patients' age for was (56.0 ± 18.27) and a range of (40.0- 76.0) years as shown in (Table. 1).

Results

1. Age at time of presentation

Table 1. Mean age distribution in the studied group.

Variable	Mean ± SD
Studied Group	56.0 ± 18.27

2. Gender distribution

Among the 20 patients recruited, 9 (45%) were males and 11 (55%) were females..

entropion among eyes of the study group revealed a predominance of moderate entropion and absence of severe entropion in the studied group as shown in (Table. 2,3,and 4 and Fig.1) .

Pre operative grade of entropion

Assessing the pre-operative grade of

Table 2. Pre operative grade of entropion in the studied group.

Grade of entropion	Number of eyes	Percent
Minimal	8.0	20.0
Moderate	32.0	80.0
Severe	0.0	00.0
Total	40.0	100.0

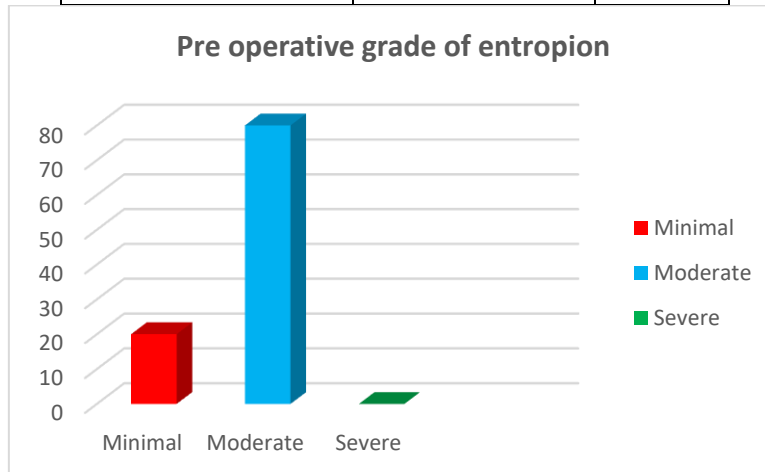


Fig.1. Pre operative grade of entropion

Table 3. Pre operative grade of entropion of the studied group.

Studied group	Pre operative grade of entropion						Total	
	Minimal		Moderate		Severe		Number	%
	Number	%	Number	%	Number	%		
	8.0	20.0	32.0	80.0	0.0	00.0	40.0	100.0

Table 4. Severity of trichiasis in the studied group

Grade of trichiasis	Number of eyes	Percent
Absent	0.0	00.0
Minor	20.0	50.0
Major	20.0	50.0
Total	40.0	100.0

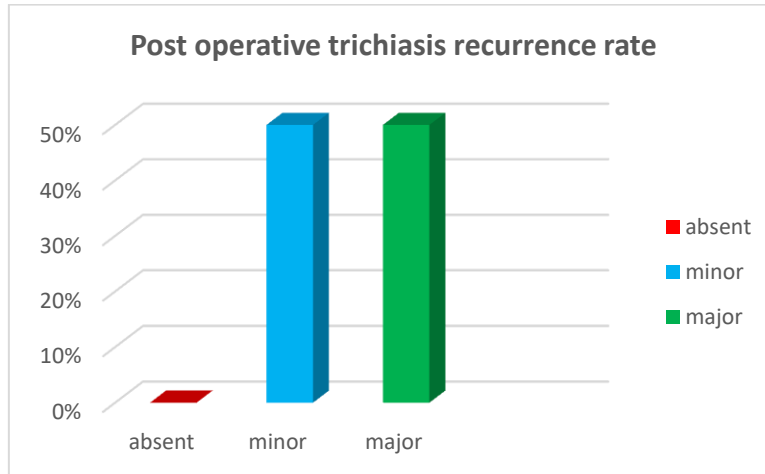


Fig.2. Post operative recurrence of trichiasis in the studied group.



Fig.3. Left eye of a patient with upper lid entropion and major trichiasis in upward gaze (pre-operative)



Fig.4. Left eye of a patient 3 months (post-operative)

▪ **Post operative recurrence of trichiasis**

Trichiasis recurrence rate was 10% in the studied group as shown in **Tables (5) and (6) & Fig.2,3, and 4.** Recurrence was seen in four eyelids of four patients despite adequate post operative lid margin position. Electrolysis to treat isolated metaplastic cilia posterior to the normal lash line was performed for all patients.

Table 5. Post operative recurrence of trichiasis.

Grade of recurrence	Number of eyes	Percent
Absent	36.0	90.0
Minor	4.0	10.0
Major	0.0	00.0
Total	40.0	100.0

▪ **Post operative eyelid contour abnormalities**

Studying the post operative ECAs and the procedure performed revealed 40% of eyes developed mild grades of ECAs which could be considered clinically insignificant while 20% of eyes developed moderate ECAs which could be considered as clinically significant.

Table 6. Post operative eyelid contour abnormalities .

Studied Group	Post operative ECAs				Total
	Absent	Mild	Moderate	Severe	
Studied Group	28.0	12.0	0.0	0.0	40.0

Discussion

Around 1.2 million people are irreversibly blind from trachoma world widely while over 7 million people have trachomatous trichiasis and require high quality surgical intervention. A major worldwide effort exists to scale up surgical programs. However, high postoperative trichiasis recurrence rates represent a substantial limitation in preventing sight loss from trachoma. Identifying the surgical intervention with the lowest recurrence rate has been a research priority for many years. Current WHO guidelines recommend tarsal rotation surgery for all cases of TT, irrespective of trichiasis severity and the degree of entropion. The rationale for this is that trichiasis is the major risk factor for the development of corneal opacification, and it is argued that patients living in remote rural locations may only rarely have the opportunity to receive treatment.

In this study, the ideal operation is that can be successfully performed without wasting of time, from a mechanical point of view, lid rotation is achieved by the advancement of the distal tarsus over the marginal tarsus. This tarsal overlap creates a downward strength on the posterior edge of the marginal tarsus and rotates the lid margin upward.

In this study, we see the "TMR" operation which is a versatile procedure that utilizes a lid crease approach with internal sutures for upper lid margin rotation (Cruz et al., 2015) in cases of trachomatous cicatricial entropion. Our study results revealed lower incidence of ECAs and post operative exposure keratopathy among the group study.

Another study was done comparing the effect of TMR operation and BLTR has several advantages in the correction of trachomatous entropion. It is easy to perform and to teach, and no tissue is excised or grafted. The anterior approach is more convenient in lid surgery and as the tarsal plate and conjunctiva (the deforming structures) are incised, the deformity is corrected and the lid

margin is free to rotate to any required position

Anyway, studying the lid crease approach of the TMR procedure revealed possible superiority in many aspects compared to BLTR procedure. At the beginning, the tarsal plate and the anterior lamella are not opened on the same level. In this approach, the vascularization affecting marginal orbicularis is not severe, therefore chances of ischemia and necrosis of the margin are significantly reduced.

Suborbicularis dissection can be done till the Riolan's muscle is reached. Absorbable sutures can be performed on the internal marginal portion of the orbicularis muscle, causing upward rotation of the lashes without using bolsters or removal of sutures. The absence of bolsters or external sutures leads to comfortable postoperative care

Then the tarsal plate is exposed totally, so it is easy for the surgeon to distribute the forces of the sutures arranging the lateral and medial stitches radially addressing one of the most common complications of lid margin rotation which is postoperative ECAs. On the contrary, as recommended in the manual of the Bilamellar lid rotation (Wies/Ballen surgery) published by the WHO, the anterior lamellar incision follows a straight line making the external sutures parallel and not radially arranged, distorting the central portion of the margin

The versatile lid crease approach can also address a variety of common lid problems other than entropion in the same sitting such as dermatochalasis, retraction or ptosis which are common among old aged population. In our study, 20% of eyes among the TMR group underwent entropion correction and blepharoplasty for dermatochalasis in the same sitting.

Moreover, In TMR procedure, the distal tarsus is advanced over the marginal portion, therefore achieving the same mechanical

downward stress on the margin as shown by Trabut. Theoretically, this result preserves the rotation of the lid margin, decreasing the occurrence of recurrent entropion. However, other study results revealed no statistically significant difference between the two operations regarding entropion recurrence rate.

TMR operation has been previously described in a single case series study that included 60 upper lids of 40 patients with trichomatous trichiasis and a mean follow up of (3.0 ± 2.71) months. The study showed post-operative satisfactory lid margin position in 100% of eyes which is almost comparable with our results and an estimated trichiasis recurrence rate of 1.6% contradictory to the 10% of our study.

In the other trial, the operative groups were comparable regarding factors likely to influence outcome, including previous surgery, grade of entropion and extent of trichiasis. Baseline demographic and clinical characteristics were statistically insignificant between the two studied groups, where there were no statistically significant differences observed regarding age (P-value 0.06), gender (P-value 0.07), preoperative grade of entropion (P-value 1.0) and preoperative grade of trichiasis (P-value 1.0).

BCVA was measured and recorded preoperatively & 3 months postoperatively using Snellen notation. Preoperatively, entropion related causes (e.g. peripheral corneal opacities, central corneal opacities and superficial punctate keratitis) were the only clinically detectable causes for visual deterioration in 50% of eyes, while lenticular and other causes per se were responsible for 35% of eyes. Postoperatively, 40% of eyes in the entropion related causes group showed improvement in BCVA. However, other eyes that had other causes couldn't be evaluated for BCVA due to the presence of multiple confounding factors other than entropion related causes. Several recent studies have shown modest improvement in visual acuity following trichiasis surgery. This may be the result of a reduction in epiphora and photophobia, an improvement in the quality of

the tear film, the resolution of corneal epithelial damage, or a gradual fading of milder corneal scars (**World Health Organization , 2000**).

The frequency of ECAs at 3 months in the TMR surgery group is 40% mild ECAs which is clinically insignificant & 20% moderate ECAs which is clinically significant giving the TMR group the best cosmetic appearance. In the other study comparing the TMR group and the BLTR group 2 eyelids have shown clinically significant ECAs within the BLTR group giving the TMR procedure a major advantage over the BLTR procedure.

In the other trial post operative exposure keratopathy has invariably been found in the BLTR group with a statistically significant difference than TMR group (P- value 0.025). In the TMR procedure, the lower edge of the dissected upper portion of the tarsal plate is drawn down and tucked into the dissected space between the anterior lamella and the lower portion of the tarsal plate behind, producing more lengthening of the posterior lamella and making this procedure more suitable for cases with lid retraction and lagophthalmos.

A potential design limitation in our study is the short postoperative follow-up time . We recommend further studies with longer follow up intervals and larger sample size with possible trial of the TMR procedure for other causes of entropion.

Conclusion

From this study Upper eyelid cicatricial trichomatous entropion can be effectively managed utilizing the TMR, with no significant incidence in entropion or trichiasis recurrence. However, TMR procedure appeared to be superior to BLTR procedure from other study regarding the incidence of significant ECAs and exposure keratopathy rendering the procedure cosmetically and clinically more promising.

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