



## **Tarsal Fracture with Modified Suturing Technique in Trachoma Induced Cicatricial Entropion in the Upper Lid**

Amira Al Hattali<sup>1</sup>, Mathew Varghese<sup>2</sup>, Saman Mohammadzadehsaliani<sup>3\*</sup>, Bindu Narayanadas<sup>4</sup>,

1. Medical officer, Department of Ophthalmology, Rustaq Hospital, Ministry of Health, Oman
2. Specialist, Department of Ophthalmology, Rustaq Hospital, Ministry of Health Oman
3. Specialist, Department of Ophthalmology, Rustaq Hospital, Ministry of Health, Oman.
4. Sr. Specialist and HOD, Department of Ophthalmology, Rustaq Regional Hospital, Oman.

**Corresponding Author: Dr. Saman Mohammadzadehsaliani**, Specialist, Department of Ophthalmology, Rustaq Hospital, Ministry of Health, Oman.

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**Abstract:**

**Background:** Cicatricial entropion is a common eyelid condition encountered by ophthalmologists worldwide. The incidence in our region is quite high due to large numbers of patients with a past history of trachoma. Tarsal fracture procedure, among several others, is used to correct this condition. However, recurrence has been a problem and success rate should be calculated.

**Material & Methods:** A retrospective interventional case series on patients with cicatricial entropion corrected by “modified” tarsal fracture technique was conducted at Rustaq Hospital, Ophthalmology department between 2015 and 2021. The success rate was evaluated.

**Results:** Most patients were female (80.6%) with the mean age of 70.6 years old. The success rate of the modified tarsal fracture was 82.9%.

**Conclusion:** Tarsal fracture is a simple, quickly-performed, and less time-consuming procedure with an acceptable success rate globally. However, our modified tarsal fracture technique showed a high success rate with no failure, which should be considered as an initial operation for cicatricial entropion in our regional hospitals.

**Keywords:** Cicatricial entropion, Success rate

## Introduction

Entropion defined as inward rotation of the lid margin, is a common eye problem caused by variety of conditions and classified as congenital, spastic, involuntional and Cicatricial. Patients usually complains of foreign body sensation, tearing or redness in their eyes, and it could be leading to serious consequences like keratitis, corneal ulcer and scar.

In many countries cicatricial entropion is a significant cause of several eye morbidities and even blindness [1]. It is characterized by tarsoconjunctival scarring due to chronic blepharitis, Stevens–Johnson syndrome, longstanding use of topical glaucoma eye drops, previous surgeries or trachoma [2].

In Oman, specifically in Ophthalmology Department at Rustaq Hospital, we noticed that the majority of entropion and trichiasis cases are secondary to previous trachoma. Trachoma is a chronic keratoconjunctivitis caused by an intracellular organism called Chlamydia Trachomatis. The disease is characterized by recurrent attacks of chronic follicular conjunctivitis, progressive conjunctival scarring with subsequent inversion of eyelid margin and misdirected lashes. It is the worldwide leading cause of ocular morbidity and it is still endemic in 53 countries as reported by the World Health Organization (WHO) [3]. WHO estimates that 21.4 million people suffer from active trachoma of which 7.2 million have blinding trichiasis while 1.2 million people are actually blind [4].

Cicatricial entropion is a challenging condition to manage; treatment requires good surgical repair as well as optimizing the systemic condition. Several corrective surgical techniques such as tarsotomy and lid margin rotation, anterior tarsal V-wedge resection, anterior lamellar recession with bucal or hard palate mucus membrane graft, and tarsal fracture have been reported with variable success rates. This means that definitive method does not exist.

However, tarsal fracture procedure could still have a role at being an initial procedure to the patients, and the success rate of this technique was questioned and brought into attention by many surgeons.

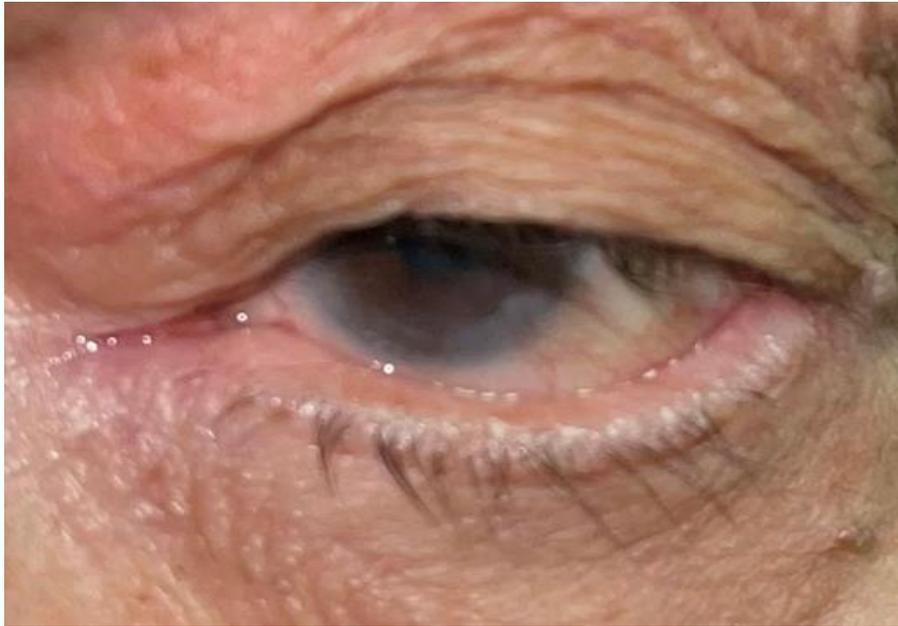
The present study showed the results of a modified tarsal fracture operation in trachoma induced cicatricial entropion of eyelids conducted at Ophthalmology Department of our regional hospital.

## Materials & Methods

This is a retrospective interventional case series on patients with cicatricial entropion corrected by tarsal fracture with modified suturing technique. Patients with 5 or less rubbing eyelashes or patients with non-trachomatous conjunctival scarring were excluded.

The medical records of 66 consecutive patients who presented with trachoma induced cicatricial entropion [Figure 1] operated by surgeons at the Department of Ophthalmology, Rustaq Hospital were

reviewed. The data were gathered between November 2015 and February 2021. The intersurgeon variability was not considered in the current study as both surgeons had adopted the same surgical technique. After excluding four cases because of short duration of follow-up (3-13 weeks), 62 patients remained (94 eyelids).



**[Figure 1: Cicatricial entropion in one of the operated patients ] (Original)**

In our technique, main idea was to increase the extent of everting force to prevent the corrected zone been influenced by the same pathophysiology existing in adjacent tissues in affected lid. This also Avoids accumulation of force vectors in a small area which can induce unpleasant outcomes such as necrosis, notching, madarosis or consecutive ectropion. To avoid variation between two surgeons, exact same method was used by them precisely without any personal preference during the procedure.

Success was considered when no any further intervention was needed. Failure was defined as 6 or more rubbing eyelashes which required second correcting surgery, whereas 5 or less were known as recurrence. Maldirected nonrubbing eyelashes (Distichiasis) were not considered as recurrence.

All patients had undergone routine blood investigations, chest X ray and ECG. Pre-anaesthetic check up was done by an anaesthetist. All cases were requested to stop systemic antiplatelets or anticoagulants after their physician consultation whenever applicable, prior to surgery. Patients were explained about their ocular condition and treatment options. Written informed consent was obtained from all patients.

The present study was approved by the institutional ethics committee for retrospective review and using patients' information for research study.

## Surgical Technique

Topical anaesthesia (0.5 % Tetracaine hydrochloride) was instilled into the lower conjunctival fornix in affected eyes. The addressed lid was then infiltrated in the submuscular space by mixture of Lidocaine HCL 2 % and epinephrine 1:100,000 and only Lidocaine HCL 2 % in cardiac or hypertensive patients. The affected eyelid and periocular area was painted with 10% povidine iodine and draped with sterile drapes. Lid guard smeared with antibiotic eye ointment (Tetracycline / Gentamycin) was kept below the upper lid.

A linear incision was made 4 mm above and parallel to the entire lid margin using number 15 bard Parker scalpel blade. Another elliptical incision was made above this incision with maximum height at the center of the eyelid. The incision was then deepened using the scalpel to include pretarsal orbicularis muscle. Using Westcott scissors, the redundant eye lid skin and pretarsal orbicularis muscle were removed. Dissection was continued to reach proper submuscular space and the tarsal plate on the upper lid was fully exposed. The tarsal plate was then fractured and split in the center along the full length of the eyelid into a proximal (near eyelid margin) & distal segments (towards eyebrow).

Four equally spaced everting sutures (using 5/0 vicryl) were then taken. Each suture passed through with skin, orbicularis muscle, through distal segment of tarsal plate and over the highest possible point over the proximal segment of the tarsus and eventually the suture was brought out through the lash line [Figure 2]. The four everting sutures were then tightened and knotted with an aim to achieve an overcorrection of entropion by 1 mm.



**[Figure 2: Modified 4 sutures technique ] (Original)**

The skin wound was then closed by interrupted sutures using 6/0 vicryl.

Lid guard was then removed. Eyelid and eye were cleaned. Antibiotic eye ointment was instilled into eye. Eye was closed and sterile dressing was applied for a day.

All patients received Tetracycline eye ointment twice daily and Fluorometholone eyedrop four times a day and lubricating eyedrops for 2 weeks. Sutures were removed by the third week. Patients completed at least 6 months of follow up and were evaluated under the slit lamp by 1 week, 3 weeks [Figure 3], 3 months, 6 months and 12 months for lid margin position and abnormalities like notching, necrosis, madarosis and consecutive ectropion as well as the condition of conjunctiva and cornea. Recurrence was evaluated as regards the site and the number of recurrent lashes. For symptomatic patients, rubbing lashes less than 5 detected during the follow up were removed by epilation.

Success was considered when no further intervention was needed. Failure was considered when recurrent lashes were 6 or more and required another surgical intervention. Maldirected, nonrubbing lashes were not considered as recurrence.



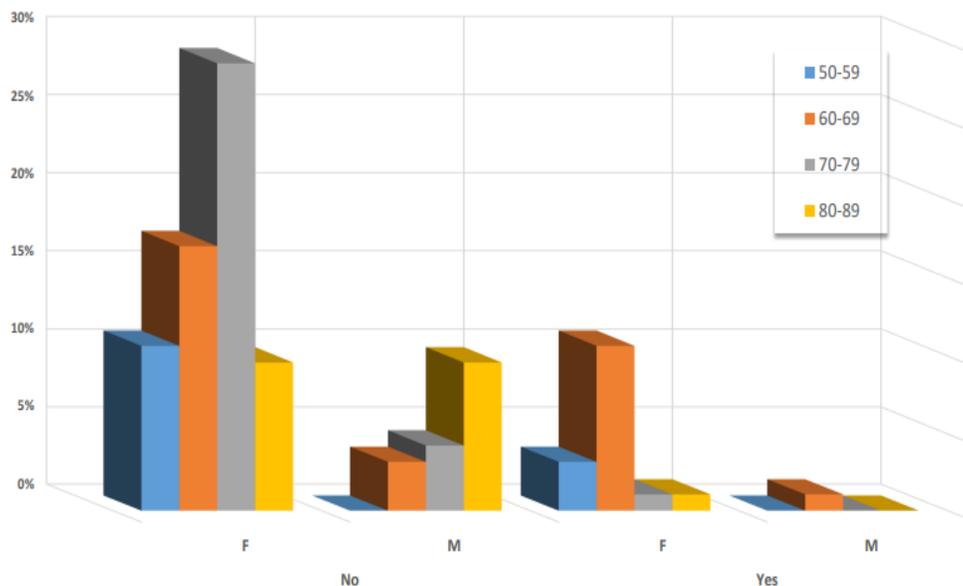
[Figure 3: 3 weeks post-op ] (Original)

## **Results**

12 patients of our total 62 cases were males (19.4 %) and 50 other ones were females ( 80.6 % ), while the age range was 54 - 87 years old with the mean age of 70.6 years [Figure4]. Among 94 eyelids 4 eyelids were operated before in somewhere else and remaining 90 were virgin. Cicatricial entropion was caused by trachoma in all of the included patients in this study.

During one year follow up entropion recurred in 16 eyelids. Recurrences happened in duration of 1.5 to 6 months after surgery, none of them was operated previously. According to these statistics, success rate in our study was 82.9 % with no need to further surgical intervention in recurrent eyelids. No complication like notching, necrosis, madarosis or consecutive ectropion was seen in recurrent or non-recurrent cases.

Overall percentage of lids according to Age Groups ,Gender and Recurrent (Yes/No)



## Discussion

As cicatricial entropion is not only an annoying problem for patients, but also a challenge for surgeons, many methods have been initiated to overcome this problem. One of the common procedures is tarsal fracture which is used worldwide with an acceptable outcome, but also has some kinds of complications due to damage to the normal structures of the eyelid.

Regarding our criteria, any cilia misdirection which needed epilation was defined as recurrence, whereas more than 5 corneal rubbing eyelashes was known as failure. Using this stringent criteria success rate of our technique was 82.9 %, which is higher than other surgical techniques, considering one time operation.

Almost similar success rate was also achieved by Chi et al (81.5%); however their sample included various causes of cicatricial entropion, and low amount of their cases (27 eyelids) could be considered as a limitation [5].

Rajak et al studied-on trachoma induced cicatricial entropion, like our study, but with different surgical method. They reported 32% recurrence rate in the first 6 months after performing posterior lamellar tarsal rotation<sup>6</sup>.

Ahmed and Abdelbaky reported 66.1% success rate by the 6th month, using anterior lamellar reposition as the treating method for trichomatous trichiasis [7].

Pombejara and Tirakunwichcha used conventional tarsal fracture to treat cicatricial entropion and achieved 74.2% success rate after first surgery. Overall success rate (87.1%) reported as total corrected lids including those underwent second surgical intervention [8]. While in our study it wasn't needed as corneal rubbing misdirected eyelash numbers never surpassed five.

As compared to others, in our study 12 months after surgery the recurrence rate was 17.1% and this achieved with only one-time correcting operation.

### **Conclusion**

Limitation of this study is inclusion of only trachoma induced cicatricial entropion.

As mentioned in comparison to ours, lower success rates were achieved by previous studies. High success rate and no need for further surgical intervention makes this technique a priority for correcting cicatricial entropion, specially due to trachoma.

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**Ethical Approval for the Research:**

Sultanate of Oman  
Ministry of Health  
Directorate General of Health Services  
South Batinah Governorate  
Directorate of Planning & Studies

سلطنة عمان  
وزارة الصحة  
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محافظة جنوب الباطنة  
دائرة التخطيط والدراسات

Ref :DGHS/2022  
Date: 9/2/2022

**To:-**  
Dr. Amira Al-Hattali  
After Compliments,

**Subject: Approval of Your Research Proposal**

I am pleased to inform you that the Research and Ethical Review & Approve Committee at South Batinah Governorate (SBG) has reviewed and approved the research proposal that you have submitted to us.

Research Title	Tarsal fracture with modified suturing technique in Cicatricial Entropion.
Research code	01042021
Principle Investigator/s	Dr. Amira Al-Hattali
Co- Investigator/s	Dr. Mathew Varghese

There is no objection to proceed with your research.  
Please note: This approval is valid for one year from the date of approval letter.

  
**Muna khalfan Ali Al Abri**  
Chairperson of Research Committee at SBG  
Director of Planning & studies, SBG



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- Director of Rustaq Hospital
- File

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