Clinical Practice Article

Lateral Tarsal Strip – A Method of Choice for Management in Variety of Lower Lid Malposition

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ABSTRACT

Purpose: To determine the effectiveness of lateral tarsal strip procedure (LTS) in treating different types of lid malposition.

Study Design: Interventional case series.

Place and Duration of Study: Sindh Institute of Ophthalmology and visual sciences from January 2019 to December 2019.

Method: There were 49 eyelids on which LTS procedure was performed. A complete ophthalmic examination was done and patients were assessed for horizontal lid laxity by pinch test. Patients with severe and moderate to severe medial canthal laxity were excluded. Patients with medial ectropion and minimal medial canthal laxity were included in the study where LTS was combined with medial spindle.

Results: Twenty three patients had involutional ectropion. Spindle procedure was performed in addition to LTS in 3 of these 23 patients. Six patients had involutional entropion. One patient had recurrent ectropion and LTS was combined with everting sutures in 3 of them. Five patients had facial palsy and two of them had combined spindle procedure. One patient had traumatic avulsion of lateral canthal tendon which was not repaired primarily. Two patients had previous cantholysis. In one patient LTS was performed to support the prosthesis in a previously eviscerated eye. All the patients underwent LTS with variation in length of lateral tarsal strip which was adjusted to horizontal lid laxity and presumed post-operative position of lower lids in relation to lower limbus and canthal angle.

Conclusion: .Lateral tarsal strip is a simple and effective procedure for correction of different types of lower lid laxity and malposition.

Key Words: Lateral tarsal strip, lid malposition, horizontal lid laxity.

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INTRODUCTION

Anatomically lids are divided into anterior and posterior lamellae. Anterior lamella consists of skin and orbicularis oculi. The anterior lamella attaches externally and anteriorly to the orbital rim. Posterior lamella of upper lid consists of tarsus, levator aponeurosis and conjunctiva whereas posterior lamella of lower lid consists of tarsus, retractors also known as capsule-palpebral fascia, conjunctiva and tendons of tarsus that attach to the inside of orbital rim.[1]

The pretarsal and preseptal orbicularis contributes to the formation of superficial and deep portions of medial and lateral canthal tendons. The medial canthal tendon supports the nasal aspect of the eyelids.[2] The lateral canthal tendon has both tendinous and ligamentous components. The tendinous part is formed by pretarsal orbicularis and inserts at the lateral orbital tubercle. The ligamentous component of lateral canthal tendon is direct extension of the tarsus, which slips

posterior to the orbital septum to insert at lateral orbital tubercle. This deep extension pulls the eyelid laterally and superiorly and approximates it to the globe.[3] At the lateral canthus there is bidirectional pull on the eyelid and causes the curve of the lower lid to hug the globe.[4] The curve of the upper lid fits to the curve of the globe but in the lower lid the tone and position of canthal attachments is also important to hold the lower lid in position.[5] Normal shape of eye fissure varies however, the lower lid rests at an inferior limbus or just above it and the lateral canthal angle is in line with the inferior edge of pupil.

The dehiscence of the lateral canthal attachments can be caused by ageing, trauma and paralysis of orbicularis muscle. This can lead to poor eyelid closure, fish-mouthing, entropion and ectropion.[6] With ageing, the collagen fibers of the tarsus decrease in number and the elastic fibers increase. This leads to increased horizontal lid laxity and tarsal atrophy. Smaller tarsal plates allow for increased chances of orbicularis override and hence lead to entropion while larger tarsus are prone to ectropion.[7]

The rationale of our study was to apply a simple technique i.e. Lateral tarsal strip procedure for correction of multiple lower lid problems.

METHODS

This interventional cases series was conducted at Sindh Institute of Ophthalmology and visual sciences from January 2019 to December 2019. Forty nine eyes were included. Patients with lower lid malposition and horizontal lid laxity of more than 6 mm were included. This included patients with involutional ectropion, entropion, facial palsy, traumatic or surgical lateral canthal damage. Patients with cicatricial causes of lower lid malposition and those with severe loss of retractor function were excluded. Patients with moderate to severe medial canthal laxity were also excluded.

Out of 49 eyes, the procedure was performed bilaterally in eleven eyes. Twenty three patients had involutional ectropion (Figure 1). Spindle procedure was performed in addition to LTS in three of these 23 patients. Six patients had involutional entropion. One of the patients had recurrent ectropion and LTS was combined with everting sutures in 3 of them. Five patients of facial palsy also underwent LTS (Figure 2).

Two of them had combined spindle procedure. One patient had traumatic avulsion of lateral canthal tendon which was not repaired primarily. Two patients had previous cantholysis due to retrobulbar hemorrhage after a road traffic accident. In one patient LTS was performed to support the prosthesis in a previously eviscerated eye. All the patients underwent LTS with variation in length of lateral tarsal strip which was adjusted to horizontal lid laxity and presumed post-operative position of lower lids in relation to lower limbus and canthal angle.

Figure 1:

Figure 2:

Table 1:

	LTS (Only)	LTS+ Spindle	LTS + Weiss Procedure	Total
Ectropion	20	3	----------	23*
Entropion	3	----------	3	6
Facial Palsy	3	2	----------	5
Traumatic Surgery	3	----------	----------	3
Prosthesis Support	1	----------	----------	1
Total eyelids on which LTS performed				49
***In 11 of them LTS was performed Bilaterally.**				

Surgical Procedure

Under aseptic measures and local anesthesia, lateral canthotomy and cantholysis was performed.

A new tendon was manufactured from the tarsal plate by excising skin, orbicularis, lashes and conjunctiva from the tarsal plate as far as the proposed position of lateral canthus. This tendon was stretched to estimate the degree of shortening and was shortened accordingly. Periosteum was exposed over the lateral orbital rim. Then the new lateral canthal tendon was suspended to the orbital periosteum through 4/0 prolene. It pulled the lateral canthal tendon strip behind the orbital rim. 6/0 vicyl suture was passed through the grey line of both upper and lower lid at the new canthus and tied to re-establish canthal angle. Orbicularis and skin were closed separately. Postoperatively patients were advised polymyxin eye ointment twice daily, analgesic if required and oral antibiotics for 5 days.

RESULTS

All patients had good cosmetic results. Eighty percent of patients had marked decrease in symptoms of epiphora at one week. At one month three patients with facial palsy had epiphora and improper lid closure. They were scheduled for gold weight implants at later date. Complications after surgery were minimal. Lid edema and conjunctival chemosis were common and short lived. Healing defects with scar formation were common in young patients but gradually decreased with massage and scar contracture over time. One diabetic patient suffered infection of suture site at medial canthus in which LTS was combined with spindle procedure. He recovered uneventfully after removal of suture, diabetes control and broad spectrum antibiotics.

DISCUSSION

Many different procedures are performed for the correction of lower lid malpositions; like medial and lateral canthal tendon plication, wedge resection and lateral tarsal strip.[8] Different studies have reported successful outcome for malposition of lower lids with lateral tarsal strip for correcting laxity of lateral canthal tendon and lower lid laxity.[9] The LTS replaced many other strategies for lower eyelid surgeries with conditions like ectropion, entropion and other causes of lower lid malposition.[10] Lateral tarsal strip procedure involves anchoring and suspension of lower lid without altering the anatomy of lower lid.[11]

The main benefit of LTS is rapid rehabilitation and good cosmetic results. It also avoids complications like horizontal phimosis and diminishes the recurrence of canthal laxity.[12] LTS has proven to be a successful procedure avoiding stretching of tarsal plate over a period of time.[13]

Jana Vydlakova et al. Conducted study including 43 eyes of patients with average age of 79 years.[14] Twenty three eyes had ectropion and 20 eyes had entropion. Majority of the cases were of involutional malposition of lower lids. Correction of eyelid malposition was achieved by lateral tarsal strip procedure with successful post-operative outcomes in more than 90% of cases. The study concluded, lateral tarsal strip technique as safe, reliable and effective surgical technique for correction of lid malpositons.[14]

López-García et al, in a study on surgical correction of 88 eyelids with ectropion and 96 with entropion described recurrence of entropion in eight eyelids (17.4%) treated with conventional lateral tarsal strip procedure, while only two eyelids (4%) showed recurrence treated with the modified technique in which they applied an extra suture.[15] After procedure, the horizontal laxity improved in both groups.

KYR Kam et al. performed a retrospective, comparative case series comparing lateral tarsal strip (LTS) with medial spindle (tarso-conjunctival diamond excision**)** for correction of involution ectropion.[16] Patients who underwent LTS alone had functional success rate of 87% (95% CI (66.4, 97.2%)) compared to patients who underwent LTS with a medial spindle procedure of 89% (75.4, 96.2%) Complication rates were similar in both procedures.

Lateral tarsal strip can be altered in terms of length of the tendon, position of tendon attachment and modification in anchoring style which makes it

versatile. It can also be combined easily with other procedures such as medial spindle and medial canthal tendon plication.

In our study we assessed and confirmed length of the tendon, proper eyelid position and vector of fixation to the orbit intra-operatively. In addition we also adjusted the vector of fixation to orbit in terms of height and placement in respect to the orbital margin. With deep set eyes fixation point of canthal anchoring is shifted downwards and more internally to prevent cloth slinging of the lower lid. In prominent eyes it was shifted upwards to prevent lid retraction and downward cloth slinging.

We also combined it with other procedures such as, in ectropion, the lateral tarsal strip was combined with medial spindle procedure in three eyes. Similarly in cases of facial palsy LTS was combined with medial spindle procedure, in entropion it was combined with everting sutures.

Complications after surgery were minimal. Lid edema and conjunctival chemosis were common and short lived. In our cases results were satisfactory in terms of both functional and cosmetic outcome.

Limitations of the study are that it was a small case series and we did not have any control group to compare the results.

CONCLUSION

Lower lid malpositions can occur in a variety of clinical scenarios. Lateral tarsal strip is a simple and effective procedure for correction of lower lid laxity and malposition. Room for modifications makes it suitable for improved functional and cosmetic outcomes.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board (**SIOVS: 3407).**

Conflict of Interest

Authors declared no conflict of interest.

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Authors' Designation and Contribution

Fariha Sher Wali; Assistant Professor: *Concepts, Design. Literature search, Data analysis, Manuscript editing.*

Adnan Abdul Majeed; Postgraduate Resident: *Literature search, Statistical analysis, Manuscript preparation.*

Rafeen Talpur; Assistant Professor: *Data acquisition.*

Shahzad Memon; Associate Professor: *Manuscript editing.*

Khalid Iqbal Talpur; Professor: *Manuscript review.*