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# TO EVALUATE THE EFFICACY OF MODIFIED MEDIAL CANTHAL TENDON PLICATION TECHNIQUE FOR TREATING LAXITY OF MEDIAL END OF LOWER EYELID

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**Abstract**

**Purpose:** The purpose of this study was to evaluate the efficacy of modified medial canthal tendon (MCT) plication technique for correcting the laxity of medial end of lower eyelid.

**Materials and Methods:** 21 eyes (11 patients), including 9 males and 2 females, in the age range of 31-80 (56.7±16.1) years, having laxity of medial end of lower lid of varying degree were enrolled in this study. These patients presented to us with ocular complaints of watering, recurrent redness, photophobia and foreign body sensation. After grading the amount of lower lid laxity, MCT plication was done for correcting it. In patients in whom laxity was associated with ectropion of lower lid, the severity of lower lid ectropion was also graded. In patients with ectropion of Grade II or more, additional procedures for correcting this were done before undertaking MCT plication. The patients were followed up till six months post operatively and assessed for correction of laxity, recurrence of symptoms and complications of MCT plication.

**Results:** 21 eyes (11 patients), including 9 males and 2 females, in the age range of 31-80 (56.7±16.1) years, having laxity of medial end of lower lid were enrolled into this study. 12 (57.14%) eyes had Grade I, 9 (42.86%) eyes had Grade II and none had Grade III laxity of lower lid. 12 eyes had laxity restricted to medial end and 9 eyes had laxity of entire length of lower lid. Among the 21 eyes, 4 (22.22%) eyes had Grade I, 11 (61.11%) eyes had Grade II, 6 (16.6%) eyes had Grade III and none had Grade IV ectropion. In these eyes additional procedure like Ziegler's cauterization (11 eyes), excision of diamond shaped segment of tarso- conjunctiva from medial side of lower lid (7 eyes), and lazy T (6 eyes) had to be done. In 1 eye, the medial canthus was anchored to the MCT and this patient had a poor apposition of lower lid to the globe. Hence, in the remaining 20 eyes, the medial canthus was anchored to the orbital periostuem.

The mean change in the eyelid length from preoperative status (32.57±3.36) to the post operative status (30.0±2.90) was 2.57mm and was statistically significant (t=17.42; p=0.0). An overriding of lower lid was seen in 2 (9.52%) eyes, and a remnant of gap between lower lid and globe was noticed in 15 (71.42%) eyes. Three (14.28%) eyes had recurrence of epiphora, two (9.52%) eyes had a recurrence of redness, one (4.76%) eye had a recurrence of photophobia and none had a recurrence of foreign body sensation.

**Conclusions:** MCT plication is an easy, effective and quick procedure for correcting laxity of lower lid which is restricted predominantly to the medial end. A correct identification of anatomical landmarks and appropriate tension of sutures passed is vital for attaining proper apposition of the lower lid with the globe.

**Key words:** Lower lid laxity, Lower lid ectropion, Medial canthal tendon plication, Medial canthal tendon .

## INTRODUCTION

One of the causes of laxity of lower lid is lengthening of the MCT. The MCT can lengthen due to iatrogenic causes like its division during dacryocystorhinostomy surgeries, removal of dermoid or hemangioma; due to traumatic causes like orbital wall fracture or nasal bone fracture; or physiological laxity as a result of increasing age.[1]

The laxity of lower lid is not an isolated complaint and is usually associated with its ectropion.[2,3] Hence, an incomplete diagnosis and thereby correction of only ectropion of lower lid while neglecting the laxity,[4,5] can result in failure of patients to recover from complaints of watering and recurrent redness of infero-nasal conjunctiva. Moreover, the medial laxity might not be an isolated phenomenon and instead the entire lower lid might be lax. If the laxity of whole length of lower lid is treated with anchoring procedures without a prior MCT plication, it is quite possible that the lower canalicular punctum is permanently displaced laterally.[6,7]

MCT plication was described for the first time by Stasior[8] for treating medial ectropion of lower eyelid associated with laxity. It shortens the affected eyelid suspensory structures and inverts the ectropic punctum.[4,9] We used the procedure of MCT plication for treatment of patients having laxity restricted to the medial side of lower lid.

## MATERIALS AND METHODS

21 eyes (11 patients), including 9 males and 2 females, in the age range of 31-80 years, having laxity of medial end of lower lid of varying degree, who presented with complaints like epiphora, chronic recurrent redness of eyes especially infero-nasal conjunctiva, photophobia and foreign body sensation, were enrolled in this study. The ocular affections like conjunctivitis, keratitis, glaucoma, lacrimal drainage obstruction and dry eye were ruled out. The lower eyelid laxity was diagnosed and graded by performing snap test as described by Hurwitz.[10]

Grade I: The lower lid could be pulled laterally but short of plane lying at medial limbus.

Grade II: The lower lid could be pulled laterally till the plane lying at medial limbus.

Grade III: The lower lid could be pulled laterally till the plane lying at pupil.

In addition to this, the extent of laxity was also examined.

The ectropion of lower lid was also graded into four grades:

Grade I: The lower lid was seen separated from the globe only on upgaze.

Grade II: The lower lid was seen separated from the globe even on straight gaze.

Grade III: The lower palpebral conjunctiva was visible.

Grade IV: The lower fornix was visible.

The preoperative length of each lower lid was measured. After doing the routine workup including syringing, blood pressure, blood sugar and bleeding time and clotting time, the MCT plication was done for all these patients.

**Surgical technique**

In patients who had either Grade II or more ectropion of lower lid associated with its laxity, the surgical techniques like Zeigler's cautery, excision of diamond of tarso-conjunctiva from medial side of lower lid, or lazy T were done at the first sitting. After a period of two weeks, these patients were then taken for MCT plication.

The technique was similar to that used by Collins[11] in which medial tarsus was anchored to the MCT insertion. We used three modifications.

In one lid in which we anchored the medial tarsus to the MCT insertion, laxity could not be corrected. Hence, we

anchored the medial tarsus to the medial periosteum. Second, we did not dissect the entire skin length extending from medial tarsus to the MCT insertion or orbital peristeum. So, the anchoring sutures had to be passed through the skin tunnel below the skin bridge. Third, the 4'0 Ethibond suture (Ethicon, Johnson & Johnson) anchoring sutures were passed in a mattress fashion to give more strength.

The tightness was adjusted keeping in view the position of lower punctum with respect to the upper punctum as well as the position of lower lid margin with respect to the globe. The two skin incisions – one at the medial end of tarsal plate and another at MCT or medial periosteum were then closed with 6'0 silk (Ethicon, Johnson & Johnson) interrupted sutures. The patients were discharged on systemic and local antibiotics.

The patients were followed up at one week, one month, three months and six months post operatively. At all these visits, the patients were asked for complaints of epiphora, chronic redness, photophobia and foreign body sensation; and were examined for recurrence of laxity. The skin sutures were removed at one week post operatively. The ethibond sutures had to be retained for anchoring the medial end of lower eyelid.

We took recurrence of epiphora as criteria for failure of surgery.

**RESULTS**

21 eyes (11 patients), including 9 males and 2 females, in the age range of 31-80 (56.7±16.1) years having laxity of medial end of lower lid were enrolled in this study. None of the patient had ocular affections like conjunctivitis, keratitis, glaucoma, lacrimal drainage obstruction or dry eye.

12 (57.14%) eyes had Grade I, 9 (42.86%) eyes patients had Grade II and none had Grade III laxity of lower lid. 12 eyes had laxity restricted to medial end and 9 eyes had laxity of entire length of lower lid. Among the 21 eyes, 4 (22.22%) eyes had Grade I, 11 (61.11%) eyes had Grade II, 6 (16.6%) eyes had Grade III and none had Grade IV ectropion. In patients with ectropion of Grade II or more, additional ectropion correcting procedures were done.

The pre-operative length of the lower lid varied from 25mm to 38mm (32.57±3.36mm). The post-operative length of lower lid varied from 24mm to 35mm (30.0±2.90 mm). The mean change in the eyelid length from preoperative status (32.57±3.36mm) to the post operative status (30.0±2.90mm) was 2.57 mm and was statistically significant (t=17.42; p=0.0).

An overriding of lower lid was seen in 2 (9.52%) eyes, and remnant of gap between the medial end of lower lid and globe was noticed in 15 (71.42%) eyes. There was recurrence of laxity only 3 (14.28%) eyes and correction had to be repeated.

Out of the preoperative lid parameters including extent of lid laxity, length of lower eyelid, grade of laxity and grade of ectropion only severity of ectropion was found to influence the recurrence of epiphora following MCT plication technique.

**DISCUSSION**

Procedures like medial canthoplasty,[7] medial tarsal strip[9] and medial tarsal strip by Anderson[4] have been tried to treat laxity of medial end of lower lid. Hurwitz recommended modified Bick's procedure[12] for mild horizontal lid laxity and Fox procedure[13] for severe cases.

The disadvantages of these procedures was that these needed extensive tissue dissection, consumed time and damaged the canalicular system. Complications like wound dehiscence[7], conjunctival granuloma[7,9], disruption of lacrimal system[4,7,9,14] residual ectropion (Grade I)[9], residual small gap between lid and conjunctiva[9] or residual medial lid laxity[4,14] have been noticed with other procedures. With MCT plication technique, previous authors have seen shortcomings like inability to achieve adequate posterior and medial placement of the medial canthal angle[9] and kinking or injury to the canalicular system[4,9,14] and need for a complimentary procedures for lateral lid shortening.[4]

As a remnant gap was left in 15 lids, we recommend a preoperative assessment of the appropriate site at medial orbital periosteum for anchoring the medial end of tarsal plate. The cause of remnant gap between the lower lid and globe in 15 (71.42%) eyes was lack of good preoperative assessment and wrong choice of anterior point on the medial periosteum for anchoring the lower lid; loose sutures; passing sutures from medial end of tarsus at level more than 2 mm away from lower lid margin; or preoperatively longer lids. We did not encounter any canalicular injury in our patients. As the grade of ectropion of lower eyelid was found to influence the recurrence of epiphora in our set of patients, this further emphasizes the importance of preliminary ectropion correction procedures before undertaking MCT plication.

The important precautions to be observed during a MCT plication procedure are –an accurate assessment of the extent of lid laxity, diagnosis of associated ectropion, correct identification of tarsal plate (as the lower lid tarsus is not as rigid and as clearly defined as the upper tarsal plate), correct site of anchoring at the medial periosteum, not to puncture the angular vein or the lacrimal sac, preventing the ethibond suture knots from loosening by avoiding continuos swabbing after one throw of knot has been given and before the second one is being tied.

Other procedures have given a success rate varying from 85.71%[7] to 91.6%.[9] With MCT plication, Anderson et al achieved the success rate of 85.7%. We had a success rate of 85.7%.

To conclude MCT plication is an easy, effective and quick procedure in the patients with laxity of medial end of lower lid with or without associated ectropion. As the sutures used for plication are non-absorbable and non-reacting, the procedure is everlasting and needs no revision.

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