ECTROPION AND ENTROPION SURGERIES - GENERAL CONSIDERATION

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Entropion and Ectropion are eyelid conditions commonly encountered by General Ophthalmologist in day to day clinical practice. Its always interesting discussing about entropion and ectropion as this gives one an opportunity to understand the anatomy of the eyelid and its clinical relevance to surgery. Both these conditions are commonly interrelated due to same anatomic structures and sharing of some common pathphysiology. Benefits of surgery are two fold, better cosmesis and more important restoration of the function of the lids as protectors of the eye. The history of operations for entropion and ectropion includes time-honored names like Hippocrates, Sucrets and Celsus and Adams, as well as Arlt, Arruga, Blaskovics, Elschnig, Fox, Gaillard, Von Graefe. Others like Hotz, Hughes, Jones, Kirby, Kuhnt, Meek, Snellen, Spaeth, Stallard, Straetfeild, Weeks, Wheeler, and Ziegler too contributed significantly for management of these common lid disorders.

A thorough understanding of the eyelid structures and the anatomic relationships between them is essential for proper diagnosis and management of eyelid disorders; I will not go in the details of the anatomy assuming the readers are well acquainted with it. The main focus is for adult and elderly patients and for situations commonly handled by general ophthalmologist rather than rare cases handled by experienced oculoplastic surgeons.

ENTROPION

Entropion is in turning of the eyelid margin resulting in cilia touching the globe (Figure1).

The severe corneal irritation secondary to contact with the lashes and keratinized epithelium of the eyelid skin is common presentation by patients in office.

In this part of the world, we see lower lid entropion frequently. The condition is symptomatic, with eye discomfort causing pain, tearing photophobia, discharge, secondary infection, and varying degrees of corneal problems.

The pathophysiology has been known for centuries, and also the surgical procedures. There are three changes which must be assessed in each case.

- Thinning and weakening of the pull of the lower lid retractors
- Elongation and stretching of the canthal tendons
- Shift and contraction of the pretarsal orbicularis muscle toward the margin of the lid

CLASSIFICATION.

1. Congenital
2. Acute spastic entropion
3. Cicatricial
4. Involutional

Congenital entropion is rare and may really be epiblepharon or excess of skin and orbicularis overlying and inverting the margin. Epiblepharon is commoner in Asian children, and it often resolves as the facial bones develop. In epiblepharon a fold of skin running across the eyelid margin causes rotation of the eyelid by mechanical effect (Figure-2). Epiblepharon will improve with age, because increased growth of nasal bridge relative to the face flattens the fold.

Congenital entropion can be repaired by reattachment of the capsulopalpebral fascia, which is described in the involutional entropion section. Epiblepharon repair is necessary if there is evidence of keratopathy or if it is symptomatic. The surgical procedure involves removal of small amount of pretarsal orbicularis to expose the inferior tarsal border. The wound is then closed by taking bites from the inferior tarsal border.

Spastic entropion occurs following eye surgery, injury or inflammation, is believed to be due to edema and blepharospasm. This may resolve with resolution of the underlying irritative process but may also cause a vicious cycle in which the spastic entropion creates more irritation and more orbicularis spasm. Botulinum toxin is often effective in paralyzing the orbicularis action and breaking the cycle. The effect of botulinum lasts 3 months but the entropion may not recur when the effect wears off.

Cicatricial entropion results from horizontal shortening of the posterior lamella in relation to the anterior lamella causing inturning of the eyelid margin. Chronic inflammation, chemical burn, chronic medication, S-J syndrome and cicatricial phemphigoid can all lead to scarring and entropion.

Trachoma is a common cause of cicatricial entropion in many parts of the world. The upper lid is commonly involved and curls in with fibrosis and contraction (Figure 3). This is a problem of serious interest and to the WHO. More than 5 million people are blind or near blind from Trachoma.

The surgery for cicatricial entropion depends upon the severity of the disease and the lid involved. The tarsal surface should be examined for sub epithelial fibrosis and degree of tarsal deformation. Upper lid entropion with cicatricial changes can be managed by tarsal rotation procedures. Lower lid cicatricial entropion needs lengthening of the tarsal plate by some intervening material like cartilage graft for restoring the contour of eyelid.

Involutional entropion is usually associated with lower eyelid. The factors alone or in combination include canthal laxity, attenuation or disinsertion of the eyelid retractors, and overriding of the preseptal orbicularis.

Horizontal laxity can be detected by poor tone of the eyelid and ability to pull the eyelid more than 6mm from the globe. The cause of such laxity is stretching of the medial and lateral canthal tendons. Normally the lower eyelid retractors maintain the lower eyelid margin in normal position. With weakening of the retractors the inferior border of the tarsus rides forwards and superiorly causing inward rotation of the eyelid.

On examination several clinical clues indicate the disinsertion of inferior retractors:

- Deeper than usual inferior fornix
- Ptosis of the lower eyelid (higher than normal lower eyelid)
- Poor lower eyelid excursion on down gaze

A white subconjunctival band may be seen below the inferior tarsal border caused by the edge of the dehisced inferior retractors.

PRINCIPLES OF SURGICAL CORRECTION FOR ENTROPION

Surgery is directed towards correction of the causative factor. My personal choice for correction of involutional and cicatricial entropion is outlined in Table 1 and Table 2. Horizontal laxity is corrected by resection of full thickness of eyelid. Excessive laxity of canthal tendon may be corrected by plication of medial or lateral canthal tendon. Laxity of canthal tendons are more frequent with ectropion.

Vertical movement of the anterior lamella over the posterior lamella is prevented by scar tissue formation between the two lamella. Scar formation is induced by placement of sutures or horizontal full thickness incision of the lid.

Poor retractor function can be corrected by inferior retractor plication. This may be combined with correction of horizontal laxity and vertical orbicularis overriding or blepharoplasty.

Cicatricial entropion is caused by shortening of the posterior lamella. In the upper eyelid it is corrected by rotation of

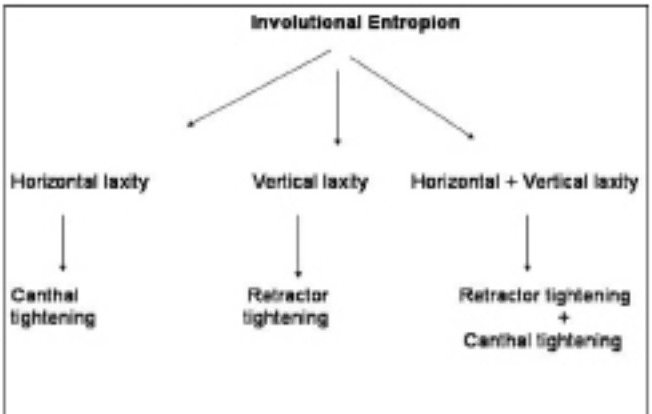

Table 1. Choice of surgical procedure for involutional entropion

Figure-1. Involutional lower lid entropion with inward rotation of the eyelid margin.

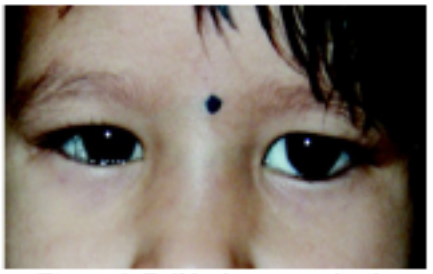

Figure-2. Epiblepharon causing in turning of the lower eyelid (R E > LE)

Figure-3. Cicatricial entropion of upperlid due to Trachomatous scarring.

the tarsal plate and in the lower eyelid by lengthening of the posterior lamella to restore the normal curvature of the eyelid.

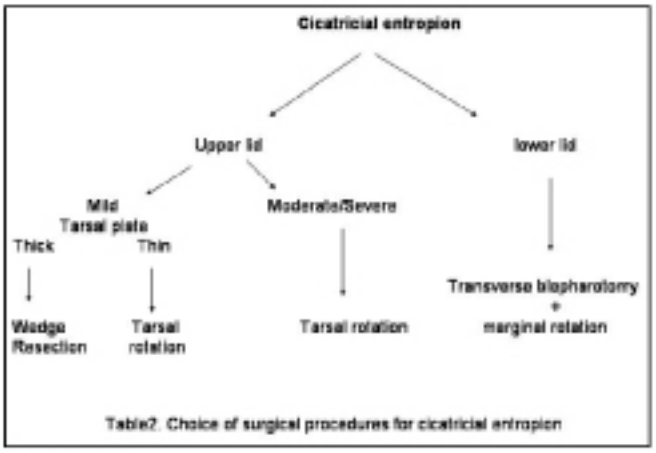

Table2. Choice of surgical procedures for cicatricial entropion

ECTROPION

Ectropion is abnormal eversion (outward turning) of the lid margin away from the globe (Figure 4). Ectropion usually involves the lower lid and often has a component of horizontal lid laxity. Treatment is individualized based on appropriate identification of the etiology. Ectropion can affect any age but most commonly is seen in older adults.

Causes

Congenital ectropion is rare and usually involves the lower lid. The cause often is a vertical deficiency of the anterior lamella. Congenital ectropion of the upper eyelid is very rare. Congenital ectropion rarely is an isolated anomaly (Figure 5). It may be associated with blepharophimosis syndrome, microphthalmos, buphthalmos, orbital cysts, Down syndrome and ichthyosis (collodion baby).

Acquired ectropion may be further classified as Involutional, Cicatricial, Paralytic & Mechanical.

Involutional ectropion occurs with aging, a major factor is horizontal lid laxity, usually due to age-related weakness of the canthal ligaments and pretarsal orbicularis. Patients with involutional ectropion have been suggested to have an age-normal or larger than normal tarsal plate, which may mechanically overcome normal or decreased orbicularis tone, in conjunction with canthal tendon laxity. Patients with anophthalmic socket may have involutional ectropion due to chronic pressure of the ocular

Figure-6. Post traumatic cicatricial ectropion of left lower eyelid

Figure-4. Senile ectropion of right lower eyelid

Figure-5. Congenital eversion of upper eyelid

Figure-7. Ectropion of left lower eyelid secondary to tumor

prosthesis. Disinsertion of the capsulopalpebral fascia may lead to severe tarsal ectropion. Inefficiency of the lacrimal pump and blink mechanism along with migration of the punctum from the normal position contribute to tearing. The conjunctiva becomes dry and inflammed due to exposure, poor flow of tears and infection.

Paralytic ectropion may occur with seventh nerve palsy from diverse causes, such as Bell palsy, cerebellopontine angle tumors, herpes zoster oticus, and infiltrations or tumors of the parotid gland. Loss of orbicularis muscle tone results in poor blink. Tear film is poorly distributed and tears pool over the lower lid margin. There is also failure of the lacrimal pump mechanism. Chronic wiping of tears is common, which worsens the ectropion. Corneal exposure can cause keratopathy.

Cicatricial ectropion (Figure 6) occurs from scarring of the anterior lamella by conditions, such as facial burns, trauma, chronic dermatitis, or excessive skin excision (or laser) with blepharoplasty

Tumors on the lower eyelid may cause ectropion due to weight of the tumor saging the lid outwards (Figure 7).

PRINCIPLES OF SURGICAL CORRECTION FOR ECTROPION

The correct surgical treatment of ectropion depends on the causing factor. The principle is to correct the defect in the normal functioning of the eyelid forces. In the planning of surgical management, the lid should be considered as being divided into anterior and posterior lamella at the grey line. The anterior lamella consistes of skin and orbicularis oculi. The posterior lamella consists of tarsus and conjunctiva in the upper half and the orbital septum, fat and lower lid retractors in the lower half.

In involutional ectropion there is excess tissue in all the layers of the lid horizontally. The medial and lateral canthal tendon may be stretched or dehisced. In cicatricial state, the anterior lamella is vertically deficient. Cicatricial ectropion requires lengthening of the anterior lamella by either free skin graft or by performing a Z-plasty of V-Y plasty with excision of subcutaneous scar tissue. A brief overview is given in Table 3

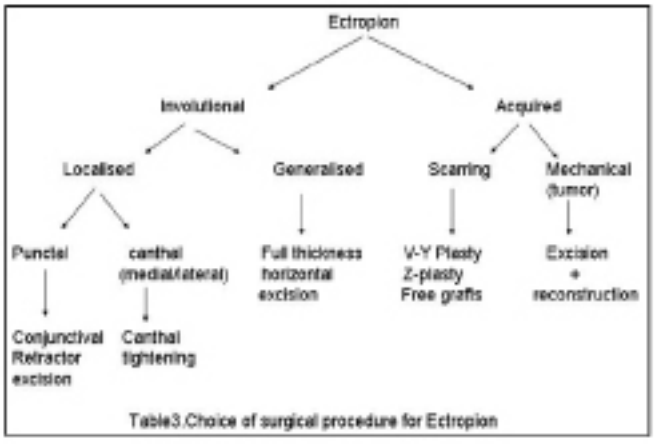

Table3.Choice of surgical procedure for Ectropion

Inferior retractor aponeurosis tightening (Jones Procedure) for Involutional entropion

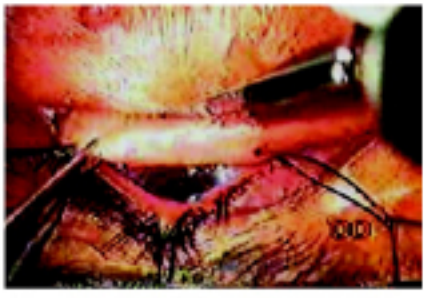

Figure-1. 4 mm below the eyelid margin a skin incision is given starting at the junction of the medial 1/3rd and middle 1/3rd, the incision extends up to the lateral orbital margin. The medial 1/3rd is not dissected to preserve the anatomy of the medial part of the eyelid.

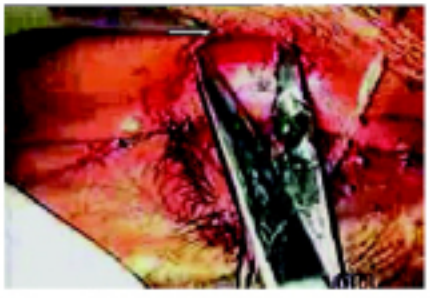

Figure-2. Dissection of the skin (white arrow) up to the inferior orbital margin.

Figure-3. The Preseptal orbicularis (black arrow) is separated from the pre-tarsal (white arrow) orbicularis, and the pre septal orbicularis is dissected down up to the inferior orbital rim.

Figure-4. The Orbital septum is identified as a thin fibrous layer just below the pre-septal orbicularis muscle (black arrow), below which lies the orbital fat (arrow head). The orbital septum is incised and the orbital fat is retracted back.

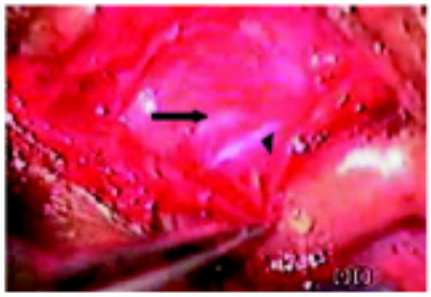

Figure-5. As the orbital fat is retracted back (black arrow) the retractor is identified as a glistening white band of fibrous tissue (arrow head).

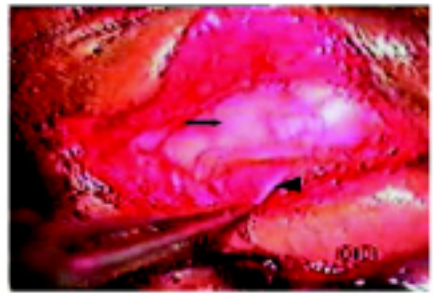

Figure-6. The dehisced retractor is held with a forcep (arrow head). Identification of retractor is confirmed movement of the retractor aponeurosis on asking the patient to move the eye up and down.

Figure-7. The retractor aponeurosis is plicated or reattached by passing the first suture in the middle and is first passed through the upper border of the pre-septal orbicularis (arrow).

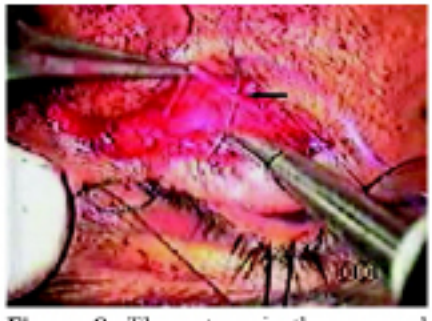

Figure-8. The suture is than passed through the retractor aponeurosis (arrow).

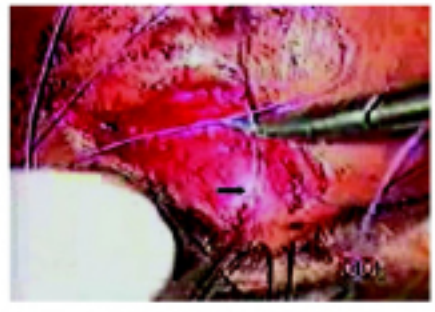

Figure-9. The needle is subsequently passed through the lower border of the tarsal plate (arrow) and the lower border of the pretarsal orbicularis.

Lateral tarsal strip for lateral canthal tightening

Figure-10. The first suture is the titrating suture and the amount of eversion to be done is judged according to the severity of entropion. 2 to 3 more such sutures are passed on both side and closure done. A small strip of preseptal skin is excised to shorten the anterior lamella. Skin closure is done with interrupted silk sutures.

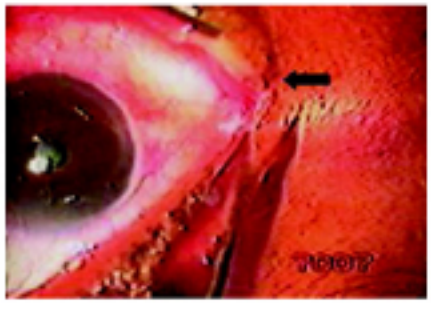

Figure-1. Lateral canthotomy is performed with scissors and extended for 1cm.

Figure-2. Lower part of the lateral canthal tendon is identified and cut vertically with scissors in downward direction. The lower lid is separated into anterior and posterior lamella. Conjunctiva and lower lid retractors are separated from the lower border of tarsus. A tarsal strip is than fashioned (arrow) and is pulled horizontally to delineate excess length, which is than excised vertically.

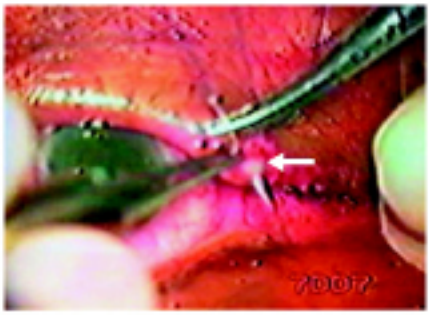

Figure-3. A non absorbable mattress suture (5-0 Prolene) is than passed through the tarsal strip (arrow)

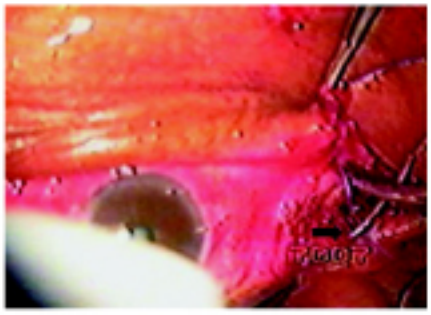

Figure-4. The strip is than sutured by taking deep bites through the periosteum at the lateral orbital margin, care must be taken to attach the strip posterior to prevent anterior migration of the canthus.

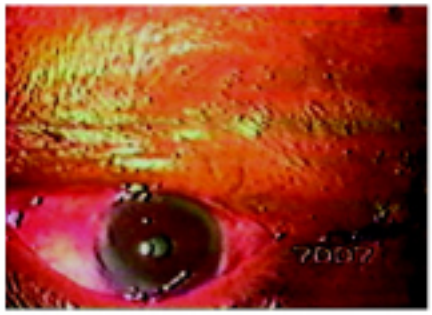

Figure-5. Excess skin is removed and the skin is closed with interrupted sutures.

Anterior tarsal wedge resection for mild cicatricial entropion

Figure-1. A Horizontal skin incision is given 4 mm above the lid margin. Skin and Orbicularis is separated from the tarsal plate.

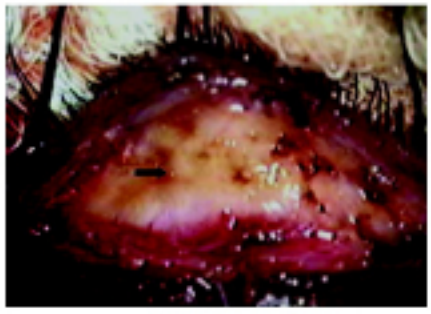

Figure-2. The anterior tarsal surface (arrow) is exposed.

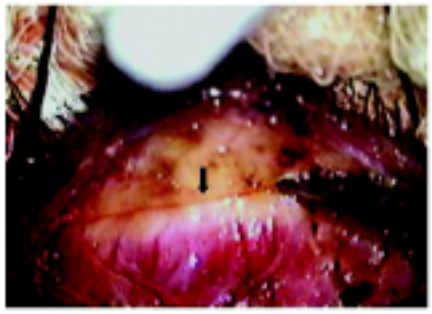

Figure-3. Incision is given over the anterior surface of the tarsus (arrow) to excise a wedge of tarsus strip with apex towards the conjuctiva.

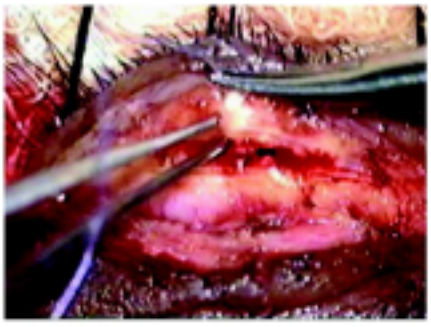

Figure 4

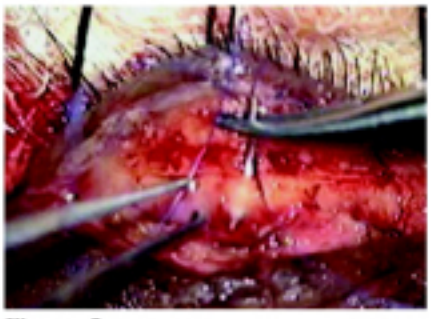

Figure 5

Figure-4 & 5. Suture is passed through the edges (arrow) of the tarsal gutter thus formed and is tied. Similar 3-4 more sutures are passed and the defect closed. This causes eversion of the eyelid.

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