CHAPTER 13

PALPEBRAL DEGENERATION

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CICATRICIAL ENTROPION AND ECTROPION

The eyelids are delicate structures. Normal closure will depend on a normal relationship of the tissues that make up the eyelids. If there are deficiencies in the inner or outer lamina, whether caused by cicatrization or contraction, function will fail and either entropion or ectropion will result.

ENTROPION

Conjunctival shortage may be caused by various diseases such as pemphigoid, Stevens–Johnson syndrome, and trachoma. The first and second of these diseases are rare but their destructive effect is severe and medical treatment is always indicated.

By contrast trachoma is much more common. Both eyelids may be affected. The most significant characteristics of trachoma are:
- Trichiasis.
- Obstruction of the lacrimal ducts.
- Inversion and rigidity of the eyelid rim.
- Symblepharon.

In order to maintain the eyelashes in a normal position, there must be a balance of tissue tension between the two anatomical layers of the upper eyelid, namely the anterior skin and orbicularis muscle layer and, posteriorly, the tarsal conjunctival layer. In cicatricial entropion, the problem is caused by shortage in the height of the posterior layer.

When conjunctival shortage exists, normal closure of the eyelids becomes impossible because the inner layer cannot keep pace with the outer layer. Activity of the orbicularis muscle will cause the pretarsal fibres to override the edges, resulting in entropion.

Surgery

In cases of generalized deficiency of conjunctival lining, suppletion with buccal mucous membrane grafts inserted parallel to the margin of the eyelid will relieve the vertical shortage and restore balance between the inner and outer layers (13.1–13.3).

Unfortunately, in spite of various surgical procedures including scar resection and mucosal grafting or even cartilage insertion, recurrence of entropion may still occur. Whether this is due to inadequate correction of the conjunctival shortage, to the lack of apposition

13.1 a Cicatricial entropion of right upper eyelid. b Correction by insertion of buccal graft parallel to the eyelid rim. c Preoperative appearance. d Postoperative appearance.
tonus in the external lamina, or to a combination of both, is difficult to determine.

In one particular case, this problem was solved by the use of opposing Z-plasties. This technique corrects the vertical shortness of both lamina without superimposing scars that could result in recurrence. Another mechanism of correction is the tightness of the horizontal limbs of the Z-plasties away from the lid margin. This tightening over a 'lesser circle' or 'higher latitude' of the globe results in a 'turning-out' of the lid margin and further correction of the entropion (13.4).


13.3a Cicatricial entropion of lower eyelid. Note rigidity of eyelid rim. b Conjunctival defect to be closed. c Insertion of buccal graft. d Repositioning of eyelid skin.
**Ectropion**

Whereas conjunctival diseases are responsible for entropion, cutaneous diseases sometimes produce ectropion. Deficiencies of skin may develop in patients with acute herpes, psoriasis, and xeroderma pigmentosum. Even minimal eversion of the eyelid margin will expose the fornix to irritation and, once this process has become chronic, keratoconjunctivitis becomes manifest, producing even more eversion or ectropion of the eyelid margin.

**Surgery**

Correction of ectropion is usually straightforward. Generous replacement of skin using a retro-auricular graft as second best choice is indicated (13.5). In spite of this, secondary corrections are not unusual (13.6). Keratoconjunctivitis is sometimes a complicating factor, since the associated hypertrophy may prevent adequate repositioning of the rim. In such cases, resection of the inflamed lining together with a small wedge excision of the margin of the eyelid near the lateral canthus will take care of the problem and restore the intimate contact of the eyelid with the global surface.

**13.4 Double Z-plasties.**

- **a** Design of cutaneous Z-plasty.
- **b** Design of tarsal conjunctival Z-plasty.
- **c** Transposition of tarsal conjunctival flap.
- **d** Transposition of cutaneous flap. (The author is grateful to his colleagues G. Tamir and D. Hauben from the Beilson Medical Centre in Tel Aviv, Israel for allowing him to use this procedure on their patient.)

**13.5 a** Cicatricial ectropion caused by xeroderma pigmentosum. **b** Correction by insertion of full-thickness skin graft. (Note the persistent excess of hypertrophic conjunctiva – resection is indicated.)

**13.6 a** Cicatricial ectropion caused by skin disease. **b** Correction by insertion of full-thickness grafts, which are adequate on the left side but not quite adequate on the right side, require secondary correction.
INVOLUTIONAL ENTROPION AND ECTROPION

The causative mechanisms of involutional entropion and ectropion are not understood, unlike the causative mechanisms already discussed. Indeed, how can one explain the paradox that rigidity and laxity or shortage and surplus of conjunctiva or skin may have similar effects on the position of the eyelid margin? And why do involutional entropion and ectropion almost exclusively affect the lower lid?

ENTROPION

Senile or involutional entropion may be observed in the upper or lower eyelid. In the upper eyelid, it is exceptionally rare (13.7). In the lower eyelid it is quite common. In these patients laxity may affect the tarsal plate, the orbital septum, the inferior retractor, the orbicularis muscle and its insertions, and the canthal tendons.

Horizontal laxity is seen when the margin of the eyelid is lifted from the globe. Vertical laxity, characterized by an excess of skin and conjunctiva, is observed when the margin of the eyelid is pulled upward. But why do these patients develop entropion?

The answer, according to this author, must be sought in the varying degrees of laxity that occur. Sisler et al., comparing specimens from both categories, found more atrophy of the tarsal plate and orbital septum in patients with entropion. Jones attributed entropion to malfunction of the retractors. It is difficult to accept that these factors alone are capable of producing entropion.

However, if laxity of the tarsus and orbital septum occurs, it is logical to assume that this laxity will also affect the interface

13.7 a Extreme laxity of upper eyelid as a rare cause of senile entropion of upper eyelid.
b Resection of triangular tarsal segment.
c Closure of conjunctival defect. d Reduction and redistribution of eyelid skin to increase apposition tension. (Reproduced from van der Meulen, JC. Radical correction of senile entropion and ectropion. Plast Reconstr Surg 1983;71(3):318–323.)

13.8 Correction of senile entropion. a Classical subciliary incision. b Removal of a triangular full-thickness wedge in the most lateral part of the eyelid, and of a crescent-shaped segment of conjunctiva in the deeper part of the fornix. c The pedicled eyelid rim is reattached to the lateral canthus with a few interrupted sutures. d After reduction of the skin surplus and, if necessary, shortening of the orbicularis, the incision is closed. (Reproduced from van der Meulen, JC. Radical correction of senile entropion and ectropion. Plast Reconstr Surg 1983;71(3):318–323.)
between the orbicularis muscle on one side and the tarsal plate and orbital septum on the other, thus allowing for minimal changes in the relative positions of the inner and outer layer under the influence of gravity. This process of differential 'sagging' will trigger the following vicious circle of events.

Once the inner layer shows a tendency to collapse, thereby exerting some downward pull on the eyelid margin, any activity of the orbicularis muscle will progressively alter the distribution of the apposition tension over the eyelid and worsen the situation. Attempts to close the eye will cause shortening of the pretarsal muscle fibres. This shortening will tend to approximate the already lax canthal tendons, allowing for progressive collapse of the inner layer and further maldistribution of muscular tone.

The pretarsal fibres will override the superior edge of the weak tarsus and cause it to buckle, and entropion results.

Techniques of correction
In the past, many techniques have been devised to correct entropion. One school of thought tries to prevent the effect of muscle action by the induction of scar tissue, by using a variety of transpalpebral suture techniques, by implanting a cartilaginous or fascial graft, or by transposing or imbricating the orbicularis muscle.

A second school reduces the horizontal laxity through a triangular excision of the tarsus or a triangular or rectangular excision of the margin of the eyelid.

A third school aims at correcting vertical laxity by various lid-shortening procedures. Still others have combined some of these ideas in a variety of ways.

In 1983, this author advocated a procedure that achieved vertical and horizontal lid reduction in combination with transposition or imbrication of orbicularis muscle (13.8). This radical approach has always been extremely effective. The technique is as follows:
1. The lower eyelid skin is first mobilized using a classical blepharoplasty incision.
2. The orbicularis muscle is exposed and the margin of the eyelid incised close to the lateral canthus. After gently pulling the margin laterally, the surgeon demarcates the excess and excises a wedge.
3. In conjunction with the triangular defect thus formed, a crescent-shaped segment of conjunctiva is removed from the deeper part of the inferior fornix.
4. The eyelid is reattached with a few inverted stitches and the orbicularis muscle is shortened or imbricated.
5. The skin incision is closed after resection of the excess skin (13.9).
ECTROPION

If a process of differential 'sagging' can be held responsible for entropion, it must also be able to cause ectropion. In patients with entropion, however, it is the outer layer that collapses first. Sagging of the orbicularis muscle and the skin under the influence of gravity will decrease the apposition tonus over the superior part of the fornix in favour of the inferior part. Loss of muscular tone will cause the margin of the eyelid to lose contact with the eye. Tears then accumulate, and the conjunctiva becomes exposed and irritated. Hypertrophy and keratoconjunctivitis develop, causing eversion of the margin of the eyelid.

Attempts to close the eye tend to increase the downward shift of the muscle fibres.

Correction

While there are many procedures still in use for the correction of entropion, only one for the treatment of ectropion has proved its efficacy over time (13.10). This is the technique of Kuhnt and Zymanovski with some minor modifications.

13.10 Correction of senile entropion. a Classical subciliary incision. b Removal of a triangular full thickness wedge in the most lateral part of the eyelid and of the inflamed conjunctiva and tarsus in the upper part of the fornix. c The pedicled eyelid rim is reattached to the lateral canthus. d The incision is closed after reduction of the skin surplus. (Reproduced from van der Meulen, JC. Radical correction of senile entropion and ectropion. Plast Reconstr Surg 1983;71(3):318-323.)

1. The lid is incised below the ciliary border in a manner resembling the classical blepharoplasty incision.
2. Skin and muscle are then separated, allowing reduction of any skin excess.
3. The horizontal laxity of the eyelid margin is corrected by removal of a wedge either in its most lateral part or more centrally.
4. The height of the lid is reduced by excision of excessive hypertrophic keratinized conjunctiva.
5. The eyelid is reattached with a few inverted stitches, the orbicularis muscle is shortened or imbricated, and the skin incision is closed (13.11).

This procedure has been used successfully in a considerable number of patients with recurrent ectropion and sufficient lower eyelid skin (13.12). Occasionally, repositioning of the margin of the eyelid reveals a shortage of skin that must be corrected with a full-thickness graft. However, correction of skin shortage only may prove to be sufficient (13.13).


13.13 a Senile ectropion caused by shortage of skin. b Correction by insertion of skin grafts from the upper eyelids. c Preoperative view. d Postoperative.


KUHNERT AND SZYMANOWSKI vide SA FOX.


