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# ANTERIOR LAMELLAR REPOSITIONING AND GREY LINE SPLIT FOR UPPER LID ENTROPION IN OCULAR CICATRICAL PEMPHIGOID

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## SUMMARY

**Purpose.** Trichiasis in ocular cicatricial pemphigoid (OCP) is usually due to cicatricial entropion and is a major cause of ocular morbidity. Unfortunately in this disease, direct surgery on the conjunctiva often results in marked inflammation and cicatrization. This paper assessed a procedure that corrects cicatricial entropion of the upper lid while avoiding surgery to the conjunctiva.

**Methods.** A grey line upper lid split and a vertical anterior lamellar repositioning was performed on 16 lids of 11 patients with OCP.

**Results.** Anatomical success was achieved in 72% of lids at 1 year and 61% had complete success with no lashes touching the globe. These outcomes were maintained up to 4 years. There were no perioperative complications. Two patients post-operatively developed severe conjunctival inflammation that required systemic immunosuppression. The causes of failure were primary surgical failure ( $n = 2$ ), progression of cicatrization secondary to surgically induced inflammation ( $n = 1$ ), development of misdirected lashes ( $n = 1$ ) and late recurrence at 7 months ( $n = 1$ ). One patient developed peaking of the eyelid.

**Conclusions.** This procedure has a good long-term outcome with minimal complications. Activation of severe conjunctival inflammation occurred in 13% of cases and this must be considered pre- and post-operatively.

Trichiasis is a common and potentially sight-threatening complication of ocular cicatricial pemphigoid (OCP) and the major risk factor for microbial keratitis in this disease.<sup>1,2</sup> It may also cause punctate epitheliopathy, corneal abrasions, conjunctival metaplasia, provoke additional conjunc-

tival inflammation and increase ocular surface symptoms.

Eyelashes may touch the globe either because of entropion, aberrantly directed lashes arising from the anterior lid margin (misdirected lashes) or because of metaplastic lashes which arise from the posterior lid margin. In OCP, lashes typically touch the globe because of cicatricial entropion secondary to posterior lamellar shortening from conjunctival stromal fibrosis.

A number of surgical techniques have been described to manage cicatricial entropion of the upper lid. These include bilamellar tarsal rotation,<sup>3-5</sup> tarsal rotation and advance,<sup>6,7</sup> eversion splinting,<sup>8</sup> tarsal advance,<sup>7</sup> tarsal grooving<sup>9</sup> and posterior lamellar grafts of auricular cartilage.<sup>10</sup> Almost all these procedures involve directly operating on the conjunctiva. Unfortunately in OCP this often triggers conjunctival inflammation and further cicatrization, which can lead to surgical failure.<sup>11-13</sup> Therefore, there is virtue in any entropion procedure that does not involve operating on the conjunctiva.<sup>14</sup>

The eyelash follicles reside within the anterior lamella of the eyelids and it is the orientation of the follicles that determines the eyelash direction. In cicatricial entropion the posterior lamella is shortened and this redirects the anterior lamellar structures including the follicles. If the anterior lamella is dissected away from the cicatrized tarsus and appropriately repositioned, then the follicles become aligned away from the globe. To ensure adequate realignment in cicatricial disease, the grey line often needs to be split because the lid margin structures are tightly bound.<sup>10</sup> This technique of grey line splitting and anterior lamellar repositioning has the added advantage that the surgery is performed on structures anterior to the tarsal plate, thereby avoiding the conjunctiva. The aim of this study was to assess the outcome of this procedure for upper lid entropion in patients with OCP.

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### MATERIALS AND METHODS

Patients were selected for this study from the External Disease Clinic OCP database at Moorfields Eye Hospital and all patients with upper lid entropion with trichiasis affecting one-third of the eyelid width or more were included. No patient had had previous lid surgery. OCP was diagnosed by conjunctival biopsy and by its characteristic clinical appearances.<sup>1</sup> A bulbar conjunctival biopsy was performed on all but 1 patient (case 11) and was defined as positive if there was basement membrane deposition of IgG, IgA or complement. Patients that were biopsy negative had characteristic subepithelial fibrosis and progressive conjunctival cicatrization. All biopsies were obtained prior to surgery.

The case details of the 11 patients and 16 upper lids are summarised in Table I. The patients had a mean age of  $74.5 \pm 7.4$  years (SD), with a range of 62–85 years. The biopsy was negative in 3 of 10 cases that were biopsied (cases 2, 3, 7). Six patients were men. The oral immunosuppressive drugs used included oral prednisolone, dapsone, sulphapyridine and azathioprine. Entropion was present in all cases and was more likely to involve the nasal or middle third of the lid rather than the lateral aspect ( $n = 15$ , 11 and 7/16 respectively).

All patients were managed uniformly by anterior lamellar reposition and a grey line split under infiltrative local anaesthesia.<sup>10</sup> An incision was made externally in the superior lid crease and the palpebral portion of orbicularis was dissected from the anterior tarsal surface. The grey line was incised for the full width of the lid, except for 1 case (case 11)

where only half the width was incised. The anterior lamella was repositioned superiorly and sutured to the anterior tarsal plate with three or four 6/0 Dexon sutures in order to produce slight ectropion. The skin and orbicularis were sutured to re-form the superior lid crease. Post-operatively, no topical or systemic medication was altered with the exception of the addition of a short course of topical antibiotics.

Two definitions of surgical success were used: anatomical success where the lid margin was restored to its normal position, and complete success where there were no eyelashes touching the globe. The data were analysed by calculating the cumulative chance of success with time.<sup>15</sup>

### RESULTS

The outcomes of surgery are detailed in Table I. There were no perioperative complications. Cases 2 and 8 developed severe conjunctival inflammation post-operatively that required oral cyclophosphamide and 80 mg of prednisolone to resolve (case 2) or an increase in the doses of immunosuppression (case 8R). No other cases had activation of the OCP as a result of the surgery. There were two primary failures; one of these (case 11R) had the grey line split for only half the width of the lid and this was complicated by early preseptal cellulitis that required oral antibiotics to settle. Two other cases were late failures at 7 months. One of these (case 8R) failed due to progression of the conjunctival cicatrization subsequent to the surgically induced conjunctival inflammation. A further case had anatomical success but was a clinical failure due to misdirected lashes.

**Table I.** Patient details and outcomes of anterior lamellar repositioning for upper lid entropion

Patient no.	Side	Pre-op. visual acuity	Oral immunosuppression	Topical steroids	Location of entropion			Follow-up (months)	Complications
					Nasal	Middle	Lateral		
Successful cases <sup>a</sup>									
1	L	6/12	—	—	+	+	—	10	—
1	R	6/12	—	—	+	+	+	4	—
2	L	6/24	+	—	—	—	+	15	—
2	R	6/9	+	—	+	—	+	21	—
3	L	6/60	—	—	+	+	—	27	—
3	R	6/12	—	—	+	+	—	11	—
4	R	CF	—	+	+	+	—	48	—
5	L	6/9	—	+	+	—	—	34	—
6	L	3/60	+	+	+	—	+	13	Peaking of lid margin
7	R	CF	+	+	+	+	+	4	—
8	L	6/36	+	+	+	+	—	15	—
Unsuccessful cases									
8	R	6/36	+	+	+	+	—	7	Severe post-op. conjunctival inflammation with progression of cicatrization
9	R	CF	+	+	+	+	+	7	Entropion recurred nasally
10	R	6/12	+	+	+	+	+	7	Misdirected lashes only <sup>b</sup>
11	L	6/18	+	—	+	+	—	4	Entropion recurred in all zones
11	R	6/6	+	—	+	—	—	3	Primary failure, post-op. cellulitis

<sup>a</sup>Success was defined as a restoration of the lid anatomy.

<sup>b</sup>This case was anatomically successful with follow-up to 48 months.

**Table II.** Cumulative chance of complete success of anterior lamellar repositioning for upper lid entropion

Post-treatment (months)	No. of lids at start of the interval	No. of zones withdrawn in the interval	No. of lids at risk	No. of failures during the interval	Chance of success	Cumulative chance of success
0-3	16	-	16	1	0.9375	0.9375
4-6	15	2	14	1	0.9286	0.8705
7-9	12	-	12	3	0.75	0.6229
10-12	9	2	8	0	1.0	0.6229
13-15	7	3	5.5	0	1.0	0.6229
16-18	4	-	4	0	1.0	0.6229
19-21	4	1	3.5	0	1.0	0.6229
22-24	3	0	3	0	1.0	0.6229
25-27	3	1	2.5	0	1.0	0.6229
28-30	2	0	2	0	1.0	0.6229
31-33	2	0	2	0	1.0	0.6229
34-36	2	1	1.5	0	1.0	0.6229
37-39	1	0	1	0	1.0	0.6229
40-42	1	0	1	0	1.0	0.6229
43-45	1	0	1	0	1.0	0.6229
46-48	1	1	0.5	0	1.0	0.6229

The cumulative chance of complete success is calculated in Table II and illustrated for both anatomical and complete success Fig. 1.

### DISCUSSION

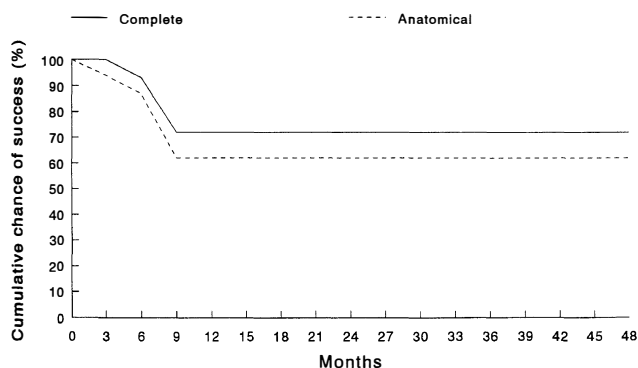
Trichiasis is a major cause of ocular morbidity in patients with OCP. In one longitudinal study, 10% (17/178) of cases of OCP developed microbial keratitis and these were associations with trichiasis (52%), topical steroid use (27%), therapeutic contact lenses (18%), 'inadvertent surgical management' (18%) and lagophthalmos (12%).<sup>2</sup> Thirty per cent developed a reinfection and all of these had uncontrolled trichiasis. Therefore, trichiasis is the major risk factor in OCP-associated microbial keratitis and is also a contributor to the ocular surface disease in these patients.

The management of eyelashes that touch the globe depends on the mechanisms involved. If the eyelid anatomy and position are normal, lashes may be misdirected towards the globe ('aberrant' or 'mis-directed' lashes) or the lashes may exit from the posterior lid margin ('metaplastic' lashes). Metaplastic lashes are known to be more common in diseases with chronic inflammation of the conjunctiva and lids

such as OCP or Stevens Johnson syndrome.<sup>16,17</sup> Surgical correction of entropion will not correct metaplastic or misdirected lashes and these areas need either chronic epilation or a lash ablative procedure such as cryotherapy. Cryotherapy achieves a long-term success rate of 70-90% in non-cicatricial lid disease.<sup>18-20</sup> Complications occur in up to 26% of patients with non-cicatricial disease and up to 77% of patients with OCP in the absence of immunosuppression at the time of cryotherapy.<sup>20</sup> In one study of cryotherapy in OCP with control of pre-operative inflammation, the cumulative chance of success at 1 year was 40% and the complications were minimal.<sup>21</sup> However, this was worse than the 72-77% chance of anatomical success with upper and lower lid surgery respectively in this disease.<sup>22</sup> Electrolysis is another option but is time consuming, may result in significant scar formation<sup>23</sup> and long-term cure occurs in only 30-50% of treated cases.<sup>5,23-25</sup>

In entropion, the lashes are directed towards the globe even though the lashes themselves have a normal anatomical relationship with the eyelid margin. This also causes malpositioning of the Meibomian gland orifices and allows the eye to contact the keratinised epithelium of the skin. All these aspects of entropion are deleterious in ocular surface diseases such as OCP and are typically improved with surgery.

The cicatricial entropion that occurs in the upper lid is usually due to posterior lamellar shortening, and the majority of surgical experience comes from patients with trachoma.<sup>4,5,8</sup> Reacher *et al.*<sup>4,5</sup> undertook two large prospective, randomised trials of upper lid trichiasis in trachoma and showed a large variation in the success rates between procedures: tarsal rotation, 68-77%; tarsal advance and rotation; 41-43%; eversion splinting, 32%; tarsal advance, 27%; tarsal grooving, 9%. Tarsal rotation involved a full-thickness, full-width lid incision 3 mm from, and



**Fig. 1.** The cumulative chance of success of anterior lamellar repositioning for upper lid entropion.

parallel to, the lid margin and this was everted with sutures.<sup>3,26</sup>

Tarsal rotation is clearly the most successful procedure in non-progressive cicatricial entropion. However, a full-thickness conjunctival and tarsal incision is integral to the procedure and in OCP this has the potential for triggering an inflammatory and cicatrising response if there has been no pre-operative control of the pemphigoid.<sup>1,12,13</sup> In the lower lid this complication may be avoided by using an external approach and avoiding surgery to the conjunctiva.<sup>14,22</sup> This current study assessed anterior lamellar advance and grey line split because the surgery does not involve the conjunctiva. The technique is comparatively safe and the 1 year success rate of 62% compares favourably with that of Reacher *et al.*'s tarsal rotation procedure.<sup>4,5</sup> Only 13% of eyes became significantly inflamed post-operatively and this supports the notion that lid surgery should avoid the conjunctiva in OCP. We would recommend that any conjunctival inflammation be resolved pre-operatively if possible. Post-operative activation of the pemphigoid may require aggressive management to prevent progression of the cicatrization.

Key words: Anterior lamella, Cicatricial conjunctivitis, Entropion, Pemphigoid, Trichiasis.

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