

# Research letter

## Nonsurgical treatment of congenital ichthyosis cicatricial ectropion and eyelid retraction using Restylane hyaluronic acid

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DEAR EDITOR, The ichthyosiform dermatoses are hereditary conditions in which genetic mutations alter the normal development and function of keratinocytes, causing a defect in skin desquamation.<sup>1</sup> Secondary ectropion and cicatricial eyelid retraction are commonly seen, often causing significant functional and cosmetic sequelae. Due to the generalized nature of the skin involved, management options are limited.<sup>2-6</sup> Here we report three patients with sight-threatening bilateral upper- and lower-eyelid cicatricial ectropion, managed with off-label use of hyaluronic acid (HA).

Case 1 is a 3-year-old boy with lamellar ichthyosis. At presentation to Queen Victoria Hospital his vision was 4/60 and hand movements, with dense punctate epithelial erosions and

5 mm of lagophthalmos on forced closure. He underwent nonsurgical eyelid expansion using HA. Similarly to previous descriptions,<sup>7,8</sup> eyelid skin was prepared with chlorhexidine. Injections were performed under general anaesthesia. Restylane<sup>®</sup> lidocaine (Galderma, Lausanne, Switzerland) HA was injected using the 30-gauge needle provided via multiple puncture sites. The upper eyelid was initially injected just above the superior border of the tarsal plate, with injections progressing lateral to medial (Fig. 1). The needle was advanced suborbicularis, injecting deep to this muscle with some passing deep to the orbital septum (although anterior to the levator aponeurosis). Approximately 0.2 mL was injected during each aliquot. When 0.5 mL had been administered, a bulge became visible. The brow was distracted superiorly and this was massaged against the orbital rim in order to mould the contour. Care was taken to avoid any pressure against the globe. A similar technique was used on the lower eyelids, with 1 mL injected into each. Closure of eyes was achieved immediately, and at 4 months his vision (Kay picture cards) had improved to 6/15



Fig 1. (a) Case 1, preoperative with eyes closed. (b) At the start of the procedure, with the patient under general anaesthetic. (c-f) Injection of hyaluronic acid gel and moulding against the rim. The patient's appearance (g) at the end of the procedure, with eyes closed, and (h) postoperatively with eyes closed.

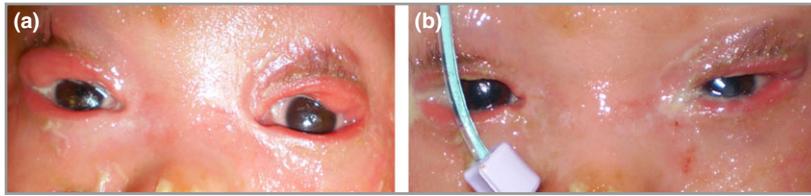


Fig 2. Case 3 (a) before and (b) immediately after treatment.

in each eye with no exposure keratopathy. He still required frequent skin emollient to prevent recurrence, but no further injections were required over 18 months. Visual acuity at the last follow-up was 6/6 and 6/9.

Case 2 is a 3-year-old boy with lamellar ichthyosis who presented to Queen Victoria Hospital with severe lagophthalmos (7 mm on blink and 4 mm on gentle closure) and multilamellar shortening of both upper and lower eyelids. A cicatricial ectropion with complete eversion of the eyelids on gentle closure was evident. Visual acuity was reduced, at 3/13 in each eye.

He underwent injection of 1 mL of HA into each eyelid as described above. One month later, further remoulding was required due to the ectropion appearing worse despite improved eyelid closure. This resolved the nocturnal lagophthalmos. After 7 months, his vision had improved to 3/3 in each eye. There was no lagophthalmos on gentle closure and no eyelid eversion.

Case 3 is a 4-month old boy with harlequin ichthyosis who was seen at St James University Hospital. He had severe bilateral upper- and lower-eyelid ectropion, despite treatment with oral retinoids (acitretin 2.5 mg daily) and intense skin emollients. When corneal scarring started to occur due to corneal exposure, he was treated with 1 mL of Restylane SubQ® (Q-Med, Uppsala, Sweden) into each eyelid (Fig. 2). Recurrence of ectropion necessitated repeat treatment at age 9 months and 16 months. Similar volumes were used in each case. Throughout this time skin emollients were continued with no reduction of frequency.

At age 18 months, ectropion surgery was deemed necessary. Full-thickness supraclavicular and preauricular skin grafts were sutured to his upper eyelids. The patient displaced one of the grafts postoperatively, resulting in recurrence of left corneal ulceration. A 1-mL repeat dose of SubQ was again injected into the upper eyelid, achieving better corneal coverage. A week after injection he re-presented with a 24-h history of painful upper-eyelid swelling. Aspiration with a 21-gauge needle grew *Pseudomonas*, *Staphylococcus* and *Streptococcus*. The patient was treated with oral clindamycin and co-amoxiclav. Swelling recovered within a week, but with recurrence of corneal exposure.

We report the use of HA to treat eyelid retraction and cicatricial ectropion in patients with lamellar ichthyosis. In two cases it proved successful in obviating the need for skin grafts or further eyelid surgery, and in the third it helped to delay skin grafting.

Traditional medical management has included lubricants and eyelid taping. This risks inducing amblyopia, as well as providing inadequate protection for severe forms of eyelid

retraction.<sup>1</sup> Need for surgery is based on each patient's mechanisms of ocular protection. Second-line therapies have usually targeted lengthening of the anterior lamella with skin grafting, but there is a generalized shortage and tightness of skin, rendering usual skin-graft donor sites restricted or unavailable.<sup>4,5</sup> HA can be an effective temporizing measure before more invasive surgery.

Successful use of HA in treating congenital eyelid malposition and eyelid retraction has been reported.<sup>7,8</sup> The technique was similar in both series to that used for cases 1 and 2 above, with HA used to create the tissue expansion. Treatment for lower-eyelid retraction that would normally require surgery was described, as well as congenital eyelid malpositions (eyelid retraction, ectropion, euryblepharon) and abnormalities associated with a shallow orbit.<sup>7,8</sup> In treating retraction, the authors reported a gradual recurrence of eyelid retraction with some residual effect in most patients at 6 months, with maintenance injections (typically at 4–6-month intervals) providing continued benefit.<sup>8</sup> Restylane was chosen due to its low injection morbidity and potential reversibility with hyaluronidase. Although reported previously, no serious complications such as visually significant blepharoptosis, orbital haematoma, vision loss, globe injury or soft-tissue necrosis from intravascular injection were seen in our series.<sup>9–11</sup>

When injecting into the eyelids, it is important to inject small aliquots while avoiding deeper injections into the orbit, in order to minimize these potential complications.<sup>12</sup> Furthermore, this technique and indication should be carried out only by those experienced in injecting this region and managing potential complications. Although case 3 developed infection necessitating aspiration, it is not always necessary to remove or dissolve all (suspected) infected HA.<sup>13</sup> We have recently managed a case conservatively with broad-spectrum antibiotics at Queen Victoria Hospital with good outcome.

In the more severe case 3, Restylane SubQ was used. It contains 1000 molecules per mL, in comparison with 10 000 molecules per mL for Perlane and 100 000 molecules per mL for Restylane, making it denser and more viscous. It is better intended for deep subcutaneous or preperiosteal injection to allow more extensive facial volume augmentation and structural support.<sup>14</sup> Although the cellulitis was culture positive, delayed hypersensitivity to SubQ has also been reported.<sup>15</sup>

We have shown here that the use of Restylane HA in patients with ichthyosis can be an effective, repeatable method of eyelid expansion that can act as a good temporizing method, often delaying the need for more invasive surgical procedures. To our knowledge, this is the first study that describes the use of HA in ichthyosis.

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