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SHORT COMMUNICATION

Ocular manifestations of congenital lamellar ichthyosis

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PURPOSE. *To describe the ophthalmic manifestations in a series of children with congenital lamellar ichthyosis. These cases presented with varying types of eyelid abnormality associated with the systemic disease. The clinical features and ophthalmic management were studied.*
METHODS.*The case histories of three children presenting to the oculoplastic clinic were reviewed. All were diagnosed with congenital lamellar ichthyosis and under the care of the Dermatology department. Family history and pedigree analysis was performed to determine mode of genetic inheritance. Ocular examination for visual acuity, eyelid and eyelash malposition, lid function and closure were carried out. Corneal examination including tests for exposure was also done.*
RESULTS. *All three patients had eyelid position abnormalities from the systemic disease. There was no clinical evidence of conjunctival involvement. One patient required full thickness skin grafts to treat corneal exposure secondary to lower lid ectropion. One had mild lower lid ectropion but without corneal exposure. The third case had the unusual finding of inward turning of the anterior lamella of the upper eyelid with a marked lash ptosis and only mild ectropion of the lower lid.*
CONCLUSIONS. *Congenital lamellar ichthyosis is a heterogeneous disorder with phenotypic variability. The most common eyelid abnormality is cicatricial ectropion of the upper and mainly lower eyelids. Most cases are managed conservatively although in severe cases secondary corneal exposure may require surgical correction. In this condition, to the best of our knowledge, the tendency for the eyelids to turn inwards has not previously been described. (Eur J Ophthalmol 2005; 15: 118-22)*

KEY WORDS. *Cicatricial, collodion congenital, ectropion, ichthyosis, lamellar*

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INTRODUCTION

The ichthyoses are a group of heterogeneous, mainly hereditary disorders characterised clinically by excessive scaling of the skin. The congenital ichthyotic disorders are divided into four main types. These are (i) ichthyosis vulgaris (ii) x-linked ichthyosis (iii) bullous ichthyosiform erythroderma (BIE) or epidermolytic hyperkeratosis and (iv) non bullous ichthyosiform erythroderma (NBIE) and lamellar ichthyosis (LI).

The main ocular associations of congenital ichthyosis are corneal opacities and ectropion of the lids.

Primary corneal opacities are found in the x-linked type. They do not cause reduced visual acuity. Secondary corneal opacities may occur from exposure caused by ectropion.

Ectropion occurs only in the lamellar type of ichthyosis and Arnold first reported this association in 1834. It is frequently bilateral and the lower lid is more severely affected. The frequency of ectropion in patients with lamellar ichthyosis is estimated to be

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45 to 80%. We present series of three cases of congenital lamellar ichthyosis to highlight the ocular features and management of this condition.

METHODS

The case histories of three children presenting to the oculoplastic clinic were reviewed. All were diagnosed with congenital lamellar ichthyosis and under the care of the Dermatology department. Family history and pedigree analysis was performed to determine mode of genetic inheritance. Ocular examination for visual acuity, eyelid and eyelash malposition, lid function and closure were carried out. Corneal examination including tests for exposure was also done. Minimum follow up was at least 6 months in each case.

RESULTS

Case 1

This patient is a 4 year old boy, born in September 1997. He was delivered at 37 weeks gestation by emergency Caesarean section because of foetal distress. His birth weight was 2410 grams. He was covered in a collodion membrane which was followed a few weeks later by a generalised scaling rash. His entire body including palms, soles and skin flexures were involved. His parents were first cousins; however there was no previous family history of skin problems. There are no other affected siblings.

At the age of 14 months he was suspected of having a convergent squint. Orthoptic examination was normal and there was no refractive error. A diagnosis of pseudo squint secondary to a wide nasal bridge was made. At age 3 years and 9 months, he was referred to the oculoplastic clinic with bilateral, cicatricial lower lid ectropion. His visual acuities were 6/9 in both eyes (Cardiff cards). Lid closure was incomplete and there was punctuate corneal staining indicating exposure. There was a good Bell's phenomenon present.

In light of his incomplete lid closure, a decision to surgically correct the ectropion was made. There were no areas of skin unaffected by the scaling process. Bilateral post auricular, full thickness skin grafts were

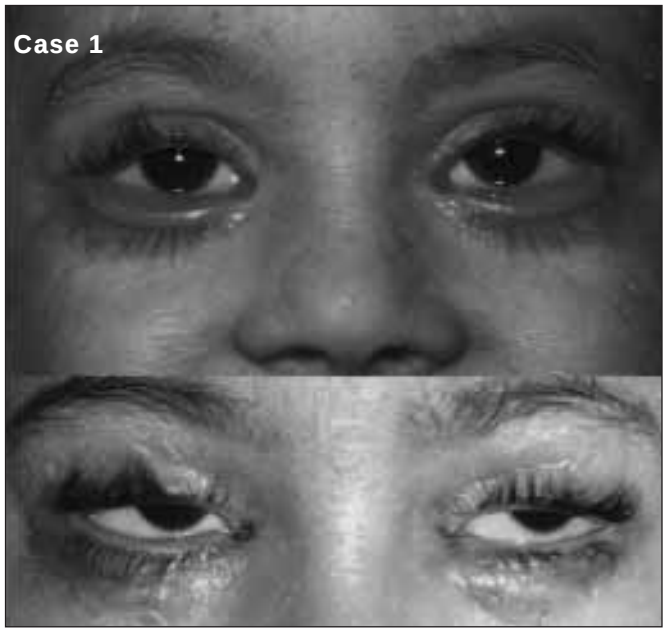

Fig. 1 - Case 1. *Top: preoperative appearance of eyelids. Bottom: 4 weeks following full thickness skin grafting to lower lids.*

Fig. 2 - Case 2. *Top: upper lid early entropion, lash ptosis, and thickened anterior lamella; mild lower lid ectropion. Bottom: subtarsal conjunctiva showing mild cicatrisation of the posterior lid margin.*

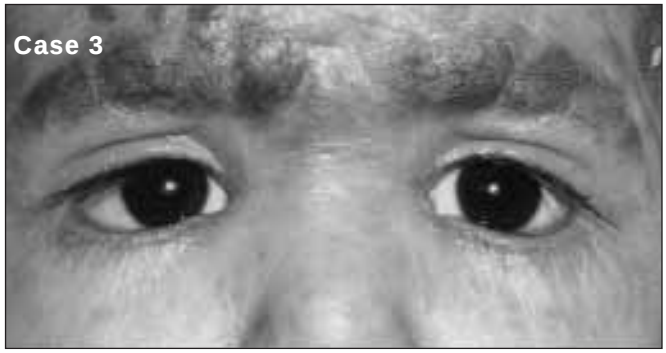

Fig. 3 - Case 3. *Bilateral mild lower lid ectropion.*

done in December 2001. The postoperative course at 4 weeks follow up has been uneventful. Complete lid closure is now possible and there is no sign of corneal exposure (Fig. 1).

Case 2

The patient is an eleven year old boy born June in 1989. He was delivered at term by elective Caesarean Section because of breech presentation. At birth he weighed 2.3kg. and he was covered in a taut, shiny membrane at birth. There was reported difficulty in opening of the eyelids at birth. The membrane peeled off in a few weeks and was replaced by a generalised scaling rash. His palms, soles and skin flexures were all involved. There are no other family members with skin problems. The family tree could be traced back three generations and his parents are first cousins. Both siblings of the proband have no known skin problems.

He is currently under care of the dermatologist and his treatment includes skin emollients, topical keratolytics (2% salicylic acid) and systemic retinoids. (Acitretin 20mg orally, once a day).

There were no ocular problems until May 1995, when he presented to eye casualty with pain in the right eye. His visual acuity (VA) in the right eye (RE) was 6/6 and in the left eye (LE) was 6/9. He was diagnosed and successfully treated for blepharitis with a regime of twice daily lid hygiene, and a short course of fluorometholone 0.1% and chloramphenicol 0.5% eye drops.

In June 2001, he presented to the eye casualty and was diagnosed with RE corneal ulcer. Cultures were negative but treatment was successful with topical ofloxacin 0.3% eye drops. Residual corneal stromal scarring in the RE was now noted and in February 2002 and the VA in the RE is 6/24, and in the LE is 6/18.

The patient has retained good lid function and there is no lagophthalmos. A good Bell's phenomenon is present. He now has a mild degree of cicatricial ectropion of the lower lids.

The upper lids do not show the classical finding of ectropion but there is a thickened anterior lamella with severe lash ptosis and a degree of inturning of the lids. The subtarsal conjunctiva shows mild cicatrisation of the posterior lid margin (Fig. 2). He is currently managed conservatively with lid emollients, topical eye lubricants, and lid hygiene twice daily.

Case 3

This 2 year old boy was born in August 2000 at term by spontaneous vaginal delivery. His birth weight was 2520 grams and he was covered in a collodion membrane. After 3 months the membrane disappeared and was replaced by a scaling rash. His palms, soles and skin flexures were all affected.

His parents are first cousins and there is no previous family history of skin problems. The proband is currently their only child.

He was referred to the oculoplastic clinic in August 2001. Ocular examination revealed bilateral, mild lower lid ectropion. Both upper lids were normal. Active lid closure was complete and there was no sign of corneal exposure. His ophthalmic management is currently conservative and consists of topical lubricants and skin emollients (Fig. 3).

DISCUSSION

The ichthyoses are a group of heterogeneous, mainly hereditary disorders characterised clinically by excessive scaling of the skin (1, 2). Ichthyosis may be congenital or acquired with the former being much more common. Based on clinical features, hereditary pattern and histological findings; the congenital ichthyotic disorders are divided into four main types (1, 3, 4). These are (i) ichthyosis vulgaris (ii) x-linked ichthyosis (iii) bullous ichthyosiform erythroderma (BIE) or epidermolytic hyperkeratosis and (iv) non bullous ichthyosiform erythroderma (NBIE) and lamellar ichthyosis (LI) (5).

Ichthyosis vulgaris is the most common with an incidence of 1 in 250. It is inherited in an autosomal dominant pattern with variable expression (5).

The scaling rash begins in later childhood and spares skin flexures, palms and soles (3). It is a mild disease and generally not associated with ocular complications (2).

X-linked ichthyosis is inherited in an x-linked recessive pattern with an estimated incidence of 1 in 6000. Affected males are normal at birth with scales appearing in later childhood (3, 5).

The face, skin flexures, palms and soles are unaffected (3). Ocular complications consist of corneal opacities, which are gray-white and located in the deep

corneal stroma. Female carriers also have corneal changes, which are not visually significant (3, 5). Biochemical abnormalities include fast moving pre-beta and beta bands on lipoprotein electrophoresis and steroid sulphatase deficiency in cells of affected individuals (5).

Epidermolytic hyperkeratosis also known as bullous ichthyosiform erythroderma is inherited in an autosomal dominant fashion and presents at birth with bulla formation (3, 5,6). The incidence is approximately 1 in 100 000. Following rupture of bullae, the typical scaling rash appears with erythema of involved areas (3, 5).

Lamellar ichthyosis and non-bullous ichthyosiform erythroderma lie at each end of a phenotypic spectrum of autosomal recessive, non-bullous ichthyotic disorders (7- 9). Clinically, they are now regarded as distinct entities but are histologically indistinguishable (5). An autosomal dominant form of lamellar ichthyosis has recently been described (7).

The frequency of NBIE is 1 in 300 000 live births (6, 11). Affected patients are born as collodion babies, i.e. encased in a taut, shiny membrane at birth that evolves into typical scale like lesions over a few days to weeks. The main clinical features of the rash are scaling and erythroderma (6). It is generally a mild disease.

Individuals with lamellar ichthyosis are affected from birth and also born as collodion babies. It is the rarest type of ichthyosis with an incidence estimated of 1in 500 000 (6).

Clinically, it is the more severe form of the autosomal recessive ichthyoses. A few weeks after birth, the membrane gradually exfoliates and is replaced by a scaling rash. The rash is generalised with skin flexures, palms and soles affected.

There is no preceding bulla formation and skin erythema is absent (12). The main ocular associations of congenital ichthyosis are corneal opacities and ectropion of the lids (1, 2).

Primary corneal opacities are found in the x-linked type (1, 2). They do not cause reduced visual acuity. Secondary corneal opacities may occur from exposure caused by ectropion.

Ectropion is described only in the lamellar type of ichthyosis and Arnold first reported this association in 1834 (1,4,13). It is frequently bilateral and the lower lid is more severely affected.

The frequency of ectropion in patients with lamellar ichthyosis is estimated to be 45 to 80% (14). The mechanism of ectropion is postulated to occur from severe drying of the skin with subsequent scarring and contracture of the lids (14). In the early stages of the disease, frequent lubrication of the lids with emollients and keratolytics has been reported to reverse the ectropion and prevent corneal exposure (2, 11, 15, 16).. In cases where corneal exposure occurs, surgical intervention is indicated.

The operation of choice is full thickness skin grafts (4, 14, 17). Suitable autograft sites can be difficult to find because of the systemic distribution of the rash. Post auricular skin has been the most commonly used harvest site (13, 14). Care must be taken to oversize the graft and to put the lid on traction postoperatively since skin shrinkage occurs following surgery (3, 4, 18). Repeat skin grafting is sometimes necessary because of recurrence of ectropion and surgical results are good (3).

The first case in our series illustrates the typical clinical course in congenital lamellar ichthyosis with progressive lower lid ectropion leading to corneal exposure and requiring surgical correction.

The second case is unique since there is no ectropion of the upper lid, but rather an inwards turning. To the best of our knowledge, this has not been described before.

To date, this has not become a severe entropion and there is no trichiasis but there is a marked lash ptosis. This is unusual for this condition since lash ptosis usually occurs in conditions where the anterior lamella is loose (19). The mechanism for these changes is ostensibly the same as that which causes ectropion i.e. chronic inflammation in the anterior lamella of the eyelid skin.

There was no clinical evidence of marked subtarsal cicatrisation. Indeed, mucosal surface involvement including conjunctiva is not a recognised association of lamellar ichthyosis (2, 6). This is perhaps why there has not been progression to gross entropion of the upper lids.

There has been no change in the lid position over the last 15 months of management with ocular lubricants. There is no trichiasis and surgical intervention has not been considered at this stage.

The third case illustrates the need for management with ocular lubricants and regular follow up. Particular attention should be paid to the degree of cicatrising lid changes and for any secondary corneal ex-

posure which is usually an indication for surgical intervention (19).

However there have been reports of reversal of the ectropion with conservative management and this should be considered in early cases (11, 15, 16, 20).

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