

## EARLY CHANGES IN MARGIN OF UPPER EYELID IN ENTROPION COMPLICATING TRACHOMA\*

BY

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FOR the past 3 years, in the Northern Transvaal, the writer has used a classification and method of recording degrees of entropion, based on the position of the line formed by the openings of the ducts of the tarsal glands on to the margin of the upper eyelid. The method offers a simple system for making an accurate clinical classification of entropion occurring early in the course of trachoma. The entropion can be classified in three clear-cut stages—Entropion I, II, and III—and the use of this method for recording findings is thought to be sufficiently objective to enable correlations to be made between the findings of different observers in different areas. The classification also records an early indication of the “relative gravity” as compared with the “relative intensity” of trachoma, before the development of trichiasis or corneal opacities. The need for data indicating the gravity of the disease is mentioned in the report of the WHO Expert Committee on Trachoma (1962).

This paper is based on the writer’s personal examination of 616 cases admitted to hospital with the primary diagnosis of trachoma, as well as of patients admitted for other eye diseases in whom trachoma was a concomitant condition. It should be recorded that trachoma is hyperendemic in this area and that entropion is very common (Amies, Murray, Scott, and Warren, 1952).

### **Anatomical Features**

The free margin of the normal upper eyelid is bounded at the inner conjunctival border by a clearly defined edge, where the skin passes into conjunctiva. Approximately 1.5 mm. anterior to this edge, and running exactly parallel to it, is the conspicuous line of white dots which are the openings of the ducts of the tarsal glands. This line roughly divides the free margin of the lid into an inner one-third between the conjunctival edge and the duct line, and an outer two-thirds which lies between the duct line and the inner row of eyelashes. The outer border of the free margin of the lid is less clearly defined and carries from three to five rows of eyelashes. The relationship of these anatomical features is remarkably constant in the normal eyelid.

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\* Received for publication December 14, 1964.

Changes are best seen by examination of the everted or partially everted lid, using the slit lamp and biomicroscope. They can also be seen with a monocular or binocular loupe with suitable illumination. Amongst the Bantu people of this area, the skin between the duct line and the inner conjunctival border is hardly pigmented and contrasts clearly with the outer two-thirds which is much darker. This enables a fairly accurate assessment to be made with the naked eye.

### **Changes occurring during the Development of Entropion**

The first change to be noted is a narrowing of the space between the tarsal duct line and the inner conjunctival edge of the lid margin. Narrowing may begin at one part of the lid, often the middle, giving the tarsal duct line a sinuous appearance. This sinuosity precedes the distortion of the whole lid which is seen at a much later stage, and is due to thickening and fibrosis of the tarsal plate. In some cases the narrowing occurs simultaneously along the whole length of the upper lid and in these the duct line remains parallel to the conjunctival edge. While these changes are occurring there is an equivalent movement inwards of the line of eyelashes, but this is less striking in the early stages and more difficult to assess with accuracy.

If the process continues, the line of the openings of the tarsal ducts is drawn still further inwards, over the conjunctival edge, until it comes to lie partly or wholly on the inner surface of the lid. For a time the openings of the individual ducts remain visible on the conjunctival surface of the everted lid and secretions can be expressed from them. Later the openings may become obliterated and disappear. During this stage the coarser skin of the outer two-thirds of the lid margin is brushing against the cornea at each blink and although distichiasis is not gross, individual lash follicles may become distorted and then some lashes will also brush the cornea.

In the final stages the follicles of all the lashes reach the inner free margin of the lid and the lashes turn in towards the surface of the globe. This is of course the fully developed picture of entropion with thickening and distortion of the tarsal plate and consequently of the whole lid. Gross keratitis, visual impairment, and blindness soon follow.

### **Pathology**

Examination of the everted lid with the biomicroscope often shows the presence of fine strands of fibrous tissue lying in the deeper layers of the conjunctiva. These may be present very early in the disease, and can be distinguished most easily when a red-free source of light is used. In the early stages it is sometimes possible to relate vertical strands of fibrous tissue with localized inversion of the margin of the lid. In other cases the fibrosis is diffuse. It appears therefore, that the mechanism is a contraction in the deeper layers of the conjunctiva exerting a direct pull on the skin of the lid margin.

In the series of cases under consideration, however, it was often possible to identify entropion by reference to the displacement of the structures of the lid margin before actual fibrosis became obvious on examination with the biomicroscope.

### Classification

Although the pathological process is almost certainly a continuous one, it is convenient for clinical purposes to divide the development of entropion into three stages, which can be clearly defined.

#### *Entropion I*

This is the stage during which the tarsal duct line is being drawn inwards toward the inner conjunctival edge of the free margin of the upper eyelid. At the same time, fine strands of fibrous tissue can occasionally be made out in the conjunctiva overlying the tarsal plate. These changes do not appear to be related directly to the intensity of the disease. Symptoms may be very slight or absent in the Bantu and progress is often insidious unless arrested by treatment. Unfortunately the entropion frequently progresses in spite of apparent clinical arrest or cure of the trachoma. This is presumably because fibrosis is an essential part of repair in the disease.

#### *Entropion II*

In this stage the duct openings and skin of the lid margins pass the inner conjunctival edge of the lid and can be seen on the inner surface of the everted lid. Symptoms now increase, and blepharospasm, photophobia, and lacrimation are usually present and occasionally severe. The disease process may still be arrested by conservative treatment, but the entropion remains or may even be increased.

#### *Entropion III*

Little need be said of this stage which is the classical picture of fully developed entropion, with distortion of the whole thickness of the tarsus, gross distichiasis, and severe corneal changes which are largely irreversible.

### Comment

These observations are based on hospital cases in which a full microscopic examination with the slit lamp was made. This would not always be possible under field survey conditions. Therefore, during the latter half of these investigations, a preliminary examination was made in each case using a loupe, and entropion when present was recorded as Entropion I, II, or III. It was found, on subsequent checking of the findings with the biomicroscope, that it had been possible to make a reasonably accurate assessment in most cases. Using this method of assessment in the follow-up of cases of trachoma, certain interesting observations have been made:

(a) Entropion I was frequently seen in Bantu who were asymptomatic and whose trachoma was otherwise apparently inactive.

(b) Entropion II was seen when it was still not possible to be certain of the presence of clinically detectable fibrous tissue in the tarsal conjunctiva.

(c) Entropion as assessed by the changes seen in the lid margin was frequently seen to progress after treatment had eliminated symptoms, reduced follicles, cleared infiltrations of the cornea, and caused the vessels in the pannus to retrogress at least to some extent.

(d) The rate of progress from stage I to II and from stage II to III appears to vary considerably and, owing to the difficulty of following up rural Bantu patients,

it has not been possible to assess this. A few cases in which the patient lapsed from treatment have, however, been traced. Three such cases progressed from Entropion I to II within 9 months and showed a marked increase in the severity of the symptoms. One patient, a boy aged 11 years, had advanced from Entropion I to III when seen 13 months after the initial treatment. Five other patients who allowed their treatment to lapse progressed from Entropion II to III in less than two and a half years.

(e) Changes in the lid margin have been seen to precede the appearance of any fibrosis in the conjunctiva detectable by clinical means.

For these reasons it would appear that the changes classified as Entropion I and II are important criteria in the assessment of the "relative gravity" as well as the prognosis of trachoma.

### Summary

Early changes in the margin of the upper eyelid, in entropion seen as a complication of trachoma, are described. For clinical purposes the changes may be classified in three main degrees, namely Entropion I, II, and III.

The importance of early signs of entropion in prognosis and the assessment of the "relative gravity" as opposed to the "relative intensity" of trachoma is stressed.

My thanks are due to Dr. A. H. Davies, Medical Superintendent of the Jane Furse Memorial Hospital, Transvaal, for permission to publish.

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