

## **Detachment of corneal epithelium / by J. Acworth Menzies.**

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## DETACHMENT OF CORNEAL EPITHELIUM.<sup>1</sup>

By J. ACWORTH MENZIES, M.D. (Edin.).

IT has happened to me to meet with several cases of this condition recently, and the fact that there is very scanty reference to it in the text-books is my apology for bringing the subject forward. Essentially the condition is one of defective attachment of the surface epithelium of the cornea to Bowman's membrane, and it usually follows a superficial abrasion. v. Arlt<sup>1</sup> appears to have observed cases as long ago as 1869, and to have published his observations first of all in 1874. He considered that the new epithelium formed after the abrasion was not firmly enough attached to the subjacent tissue and so easily became separated. Grandclément<sup>2</sup> described similar cases in 1888 as cases of traumatic keratalgia, and in 1889 Bronner<sup>3</sup> read a paper on the subject before the Ophthalmological Society in which he stated that when other means failed, cure might be effected by excision of the corneal cicatrix. For a full account of the historical aspect of the subject the papers of Szili<sup>4</sup> and v. Reuss<sup>5</sup> may be consulted. Szili may be said to have crystallised the whole subject in his admirable paper "Ueber Disjunction des Hornhautsepithels," and v. Reuss's later paper, "Die Erosionen der Hornhaut und ihre Folgen," still

<sup>1</sup> Read at the Meeting of the British Medical Association (Section on Ophthalmology), Manchester, 1902.

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further serves to give a clear presentment of the subject.

My own attention was first called to the matter in 1899 by a case which was published in the *British Medical Journal*<sup>6</sup> in February, 1900. The patient was a woman who had suffered for five years, and who dated her trouble from a blow with a cricket ball. She had been under treatment without avail, and her life was made miserable by the fact that any movement of the lid over the cornea gave her acute pain. There was no foreign body, and it was only with great difficulty that I made out a ruffling of the epithelium at one spot. Bandaging was of no use, and ultimately I scraped the diseased area thoroughly and obtained a permanent cure. Since that time I have been enlightened by the papers to which I have referred, and others, and also have met with five other cases and one doubtful one.

I will describe very briefly the symptoms, causation, pathology and treatment of the condition, and give short notes of the six typical cases I have seen.

*Symptoms.*—In all cases there are recurring attacks of pain, but there are two main types: (1) In the first of these the attacks usually occur on opening the eye in the early morning or during the night, or it may be on rubbing the eye in a certain way. In this form the duration of the pain is brief, and in the intervals the surface of the cornea may appear normal, or at the most may show a tiny grey speck. But even then Szili has shown that it is possible to raise a fold of epithelium with forceps. (2) Of the second type the case which I have related may be taken as an example. At one spot is a patch of epithelium resembling a collapsed blister, and the movements of the lid over this acting on the nerve endings give rise to the feeling of a foreign body being present. The epithelium may be clear or it may be opaque, and, so far as my

experience goes, the pain seems to be less severe in the latter case.

*Causation.*—In the majority of cases there is the history of a blow or other injury. In four of Szili's cases there was no history of injury. In my own cases the history of injury was definite in all but one, and in that the patient was somewhat vague as to whether the trouble began with his getting some coal dust in his eye or not. The other patients ascribed their condition to injuries with a cricket ball, a tennis ball, a broom handle, finger-nail (two cases), and a chip of iron respectively.

*Pathology.*—In the traumatic cases there has been a superficial injury to the cornea, following which the epithelium has not become firmly attached to the subjacent tissue. Then, as in dry catarrh, the inequalities of the corneal epithelium become interlocked with corresponding inequalities on the tarsal surface when the eyes have been closed for a time. When the eye is suddenly opened the lid pulls upon the corneal epithelium, raising it in the form of a blister and dragging upon the nerve filaments so as to cause pain. In cases of the first type the detached epithelium soon settles down again and the lid moves smoothly over it. In the second type of case the movements of the lid continue to drag on the epithelium, which becomes stretched so as to form a blister. This blister may burst, when the ragged epithelial margins are easily detected, or an ulcer may result. This occurs at or near the site of the original injury. The pain is very severe. Szili has examined pieces of the detached epithelium microscopically, and finds that the cells show shrinking of the nuclei with perinuclear vacuole formation, and also that intercellular spaces appear, some of them filled with granular masses. v. Reuss suggests that the movements of the lids draw out the epithelial cells at the edge of the original abrasion in

length, as has been shown by Carl Hess to occur in filamentous keratitis. He believes that this condition only occurs after a superficial injury, and that if deeper scar tissue is formed the epithelium becomes firmly attached to it. Grandclément and a few other writers have described attacks of pain following an injury and ascribed them to a neuralgic condition, but in all probability in these cases a detachment of the epithelium would have been found if it had been carefully looked for. Szili points out that when other methods of examination have given a negative result, ophthalmoscopic examination will often reveal the lesion as an irregular shadow on the cornea. Stood<sup>7</sup> considers that the regenerated epithelium does not become attached to the injured Bowman's membrane so firmly as is normal, and that during the night it is sucked from its bed by the tarsal conjunctiva and torn away by the movement of the lid on awakening. Then transudation of lymph occurs and keeps the surfaces apart. Weigandt<sup>8</sup> quotes Schoeler's theory that a tiny foreign body is left under the epithelium. This prevents union and causes effusion of lymph, which leads to further detachment. Weigandt himself agrees with v. Reuss, but proposes to add a third group to the classification, viz., cases of keratitis bullosa of traumatic origin. My own observations lead me to agree with the advisability of adding this third group for those cases where the detachment remains fairly permanent, the epithelium is opaque and the pain less severe.

*Diagnosis.*—This depends largely on the history. In cases of the first group the characteristic feature is the pain on opening the eye in the morning. In the more severe cases fluorescein may be used and will reveal the site of the lesion if there is any degeneration of the epithelium. I prefer to depend on gentle pressure of the lower lid against the cornea while the patient looks down. By that means the slack epithe-

lium is easily discovered, if it is detached at the time of examination. The prompt recognition of the condition may save the patient weeks, or as in one of my own cases, years of pain. Suspicion should be aroused when the patient is obviously suffering extremely, and there is apparently only a slight corneal lesion or none at all.

*Treatment.*—(1) Prophylactic. It is probable that if one could keep the eye closed and completely at rest after a corneal abrasion, detachment of the epithelium would not occur. The lids at least may be kept steady by a firm bandage for a few days, and in some cases it might be possible to persuade the patient to lie in bed with both eyes bandaged till healing had occurred. But, generally speaking, in most cases thorough prophylactic treatment will be out of the question. (2) When the detachment has occurred, the treatment will vary according as the case belongs to the first or second group. In the former case one should aim at promoting the attachment of the epithelium to its bed, and of preventing the occurrence of the matutinal attacks of pain. For these purposes v. Reuss advises the use of a neutral fatty substance to be put in the eye on going to bed. He also recommends daily massage through the eyelid with boric lanolin or yellow ointment. Cocaine drops may be kept at hand during the night, to be used if necessary. Stood advises massage with ointment at night, and dry massage in the morning before opening the eye, followed by massage with ointment after the eye is opened. He believes that massage leads to a firmer attachment of the epithelium.

In the cases of the second group my experience has been in agreement with that of Szili and v. Reuss. All treatment has proved unavailing until the epithelium has been thoroughly removed from the affected area and for some distance around. I have also found

that the new epithelium may not attach itself to the underlying tissue until the surface has been scraped with a sharp spoon. After the little operation the eye is firmly bandaged and the patient kept in bed for a few days till healing is complete. The bandage may be removed daily to allow of the eye being bathed with boric lotion. A permanent cure is effected in this way.

CASE I.—Mrs. W., seen first August 4, 1899; duration, five years; cause, blow with cricket ball (*v. antea*). Prescribed bandage and drops of boric acid and cocaine. *October 6.*—No better; scraped affected part thoroughly. *October 30.*—Better; has remained well ever since, except for slight ulceration of the cornea in December, 1899.

CASE II.—M., man, aged 43, seen first December 23, 1900; duration, six to eight months; cause, probably coal dust in eye. Removed epithelium. Atropine, lotion of zinc chloride, bandage. *January 21.*—Epithelium detached as before; bandaged and kept in bed three weeks. *February 15.*—No better. Scraped thoroughly; better one week later, and has remained well.

CASE III.—G. J., man, right eye injured with tennis ball. Abrasion of cornea; healed well; since then has complained of pain on waking occasionally, or when the eye is rubbed in a certain way. Is under treatment—ointment and massage.

CASE IV.—Miss S., April 12, 1902; attacks in one eye (left) on waking suddenly. Have occurred every now and then for two years since blow on the eye with a broom handle. Ointment and massage.

CASE V.—Mrs. H., aged 58, seen first June 2, 1902. Right eye bad four months, since scratch with baby's finger nail; ulcer of cornea. *June 16.*—Epithelium healed over ulcer, but detached; scraped. Atropine, boric lotion, bandage. *June 23.*—Epithelium healed but again detached; scraped more thoroughly, removing epithelium from entire cornea. *June 30.*—Quite firmly healed; remains well up to the present.

CASE VI.—Mrs. B., aged 63; seen first July 11, 1902; left eye bad two or three months, since scratch with thumb nail. Epithelium, lower half cornea, detached; scraped, boric lotion and bandage. July 19.—Quite firmly healed. July 26.—Feels quite well.

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- <sup>3</sup> Bronner, "On some Forms of Traumatic Keratalgia," *Ophthalmological Society Transactions*, 1889.
- <sup>4</sup> Szili, "Ueber Disjunction des Hornhautsepithels, v. *Graefe's Archiv*, li., 3.
- <sup>5</sup> v. Reuss, "Die Erosionen der Hornhaut und ihre Folgen," *Cent. f. prakt. Augenheilk.*, 1901.
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- <sup>7</sup> Stood, "Ueber recidivirende Blasen-bildungen auf der Hornhaut des Auges und 'Keratalgien' nach Verletzung der Hornhaut-Oberfläche," *Archiv f. Augenheilk.*, xliii., 4.
- <sup>8</sup> Weigandt, "Zwei Fälle von Keratitis bullosa nach vorausgegangener Erosio Corneæ," *Cent. f. prakt. Augenheilk.*, 1902.

