

XI. THE WATERING EYE

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In the practice of ophthalmology one of the most common complaints is that the eyes water, one of the rarest that the patient is unable to weep.

During the waking hours there is a constant flow of tears from the lacrymal gland. This secretion is distributed evenly over the cornea by the act of blinking, and ensures adequate lubrication to maintain the high polish on the surface of the eye, and serves as a protection against the constant impingement of foreign particles and infected matter. Normally very little secretion finds its way through the canaliculi to the lacrymal sac and thence into the naso-lacrymal duct, evaporation keeping pace with secretion, yet any impairment of function of the drainage channels does cause a watering eye; this condition is called epiphora.

Clearly, then, in investigating a weeping eye it is necessary to establish whether one is dealing with a case of lacrymation or of epiphora. Though at times this may be difficult, and on occasion the conditions occur together, the great majority of cases can be assessed correctly without recourse to the more specialized procedures, the techniques of which lie in the domain of the ophthalmologist.

First, it can be emphasized that when the complaint of watering is the presenting symptom—when the patient has come for help because the eye is watering—then epiphora is the likely cause. Contrariwise, where the complaint of watering appears secondary and is associated with other ocular symptoms, lacrymation may be suspected. Of the two, epiphora is by far the more

disturbing, is more persistent and is excited by different, usually physical, stimuli.

EPIPHORA

Epiphora then is more exactly the condition indicated under the heading 'the watering eye', and will be considered first.

The causes of blockage, either partial or complete, of the lacrymal passages vary with age, sex and social habits. Thus acute dacryocystitis with consequent blockage is a common disease in the middle age-groups seen in hospital out-patients, though relatively uncommon in private practice. The chronically obstructed naso-lacrymal duct is a disease of women more often than of men owing, in all probability, to the fact that in women the bony canal is narrower. Ectropion with its misplaced lacrymal puncta occurs in the elderly.

Congenital

However, the first to be met, and this is common, is the baby with one or both lacrymal ducts imperforate. The complaint is that from birth, or within two or three weeks of birth, either one or both eyes have watered—indeed the onset of the epiphora is coincident with the commencement of the secretion of tears, for it will be remembered that a newborn baby does not weep; it may bawl, howl and grow red in the face, but tears do not flow for the first two or three weeks of its life. As a rule, and unless secondary infection has occurred, there is no real pus, but a certain amount of sticky mucus at the inner canthus of the eye; the conjunctiva is not red or injected as in conjunctivitis, and this observation together with the history is sufficient to establish the diagnosis without further ado.

In some cases the overflow of tears is caused by cellular debris still present in the very recently canalized naso-lacrymal duct, and often enough these cases cure themselves if one allows time for them to do so; all that is required is that the eye be kept clean and the parents reassured, though this last may be far from easy. Other cases are due to the lower end of the duct where it opens into the inferior meatus of the nose at the valve of Hasner being imperforate. These cases have to be probed. Unfortunately there is no way of telling which of these conditions is present in a given case, but as a rule it does no harm to wait a few weeks to see whether, with conservative treatment, cure will take place, before submitting the infant to an anaesthetic for the purpose of probing the duct.

Nevertheless it is a mistake to delay overlong, and it is a fair rule that if the tears are not draining freely by the age of 5 months a probing operation should be done; it is a simple procedure, once the technique has been learned, and almost always successful.

Congenital absence of lacrymal puncta is rare. I can recall only 2 cases in my recent experience; one is the child of a colleague whom I examined for possible refractive error. She had no suggestion of epiphora and her father was delighted to point out the anomaly which I had not noted. The other, seen in out-patients' department, a child of the same age and sex, has an eye which waters continually, and of course a chronic conjunc-

tivitis from the perpetual rubbing. An artificial opening direct from inner canthus into sac may help but only if a high state of cleanliness is maintained, and this is almost too much to expect.

Dacryocystitis

The next common cause of epiphora is infection in or around the lacrymal sac; it may be acute or chronic.

The acute sac presents with all the signs of inflammation, the centre of which is, of course, over the lacrymal sac; the diagnosis and treatment form no part of this paper, but it is worth mentioning, in passing, that an acute sac points below the medial palpebral ligament and not above it. Once there has been an acute infection of the sac, however, it is likely that fibrosis of the outlet occurs and so blockage of this narrow passage; thus chronic dacryocystitis with regurgitation of muco-pus through the puncta on pressure over the sac, is a certain and frequent cause of watering.

All sorts of organisms have been isolated from lacrymal-sac secretion. Pneumococcus has been found to be a frequent inhabitant, but any of the common pathogens may be present, not excluding bacillus coli. Isolation of the organism is therefore worth while if conservative treatment is to be attempted.

In children one must remember that both tubercle and syphilis, by attacking the underlying bone, can be causative.

A mucocele of the sac is not uncommon, and more often than not there is no history of acute inflammation; it presents as a swelling about the size of a split pea which can be reduced by pressure, when the mucoid material passes back along the canaliculus into the conjunctival sac or, more rarely, can be squirted down the naso-lacrymal duct into the nose.

Treatment of the chronic lacrymal sac is in the first place by repeated, but gentle, probing and filling the sac cavity with a solution chosen to attack the offending organism, if this has been isolated. If this procedure fails, and more often than not it does, either a dacryocystectomy or dacryo-cysto-rhinostomy operation is required.

Neoplasm, which may cause watering by blocking the passage anywhere in its course has to be remembered, as in all other differential diagnoses, but it is fortunately rare.

Malposition of Puncta

Next to be considered is epiphora associated with malposition of the lacrymal puncta; in practice only the lower punctum need be considered.

The puncta drain fluid from the surface of the eyeball by capillary action, and in order that this mechanism should function efficiently they must be in exact apposition to the globe. Eversion of the lid margin, therefore, which displaces the punctum so that a space exists between it and the bulbar conjunctiva, is bound to cause epiphora. This eversion, when slight in extent, is easily missed, and it is useful to note that under normal circumstances, when the patient looks upward, it is just not possible to see the punctum of the lower lid without pulling the lid away a little with the finger; if it can be seen without this manoeuvre it is out of position.

Again, the fibres of the orbicularis muscle have a compressing action on the lacrymal sac so that, in blinking or squeezing the eyelids, fluid in the sac is forced down the naso-lacrymal duct while, on release of the pressure, fluid is drawn through the canaliculi into the sac. If, therefore, there is a weakness of this muscle, as in facial palsy, two things may happen to cause epiphora—the lid may sag bringing the punctum away from contact with the eye, and the pumping action on the lacrymal sac may become inefficient.

With this mechanism of tear drainage from the conjunctiva in mind, it is a simple matter to understand how disease such as chronic blepharitis, dermatitis of the lid, or trauma which interrupts the continuity of the lid margin, can bring about a weeping eye, and how this, aided by the continued wiping of the eye and chronic irritation, leads eventually to the unsightly and distressing ectropion with 'lacrymal conjunctivitis', hypertrophic changes in the mucosa, and maceration of the lower lid, so commonly seen in elderly folk; and this despite the fact that the lacrymal passages are patent, as can be shown by the use of a simple syringe.

Treatment of course depends upon the cause. In all cases it is essential to establish that the passage is clear, and the best and simplest way of doing this is by dilating the punctum and syringing gently, when fluid should pass easily, and be felt by the patient in the nasopharynx. Thereafter efforts are directed to the establishment of adequate drainage by surgical means. It may be necessary only to remove the inner wall of the punctum (the first vertical millimetre of the canaliculus) so that the opening again comes into contact with the globe, or carry out a considerable plastic operation to lift and invert the lower lid in order to regain correct apposition.

Trauma

Trauma to the inner quarter of the lower lid is frequently seen and deserves special mention. Often the canaliculus is cut and, if it is left unattended, or the lid margins simply sutured, epiphora is a certain result. These cases require painstaking surgery: a silver wire is inserted into the lacrymal punctum, passed through the cut canaliculus and down the naso-lacrymal duct to appear at the nostril. Over this is passed a narrow polythene tube and the wire removed; the two ends of the tube are strapped to the cheek; and finally the cut canaliculus is sutured round the tube. The tube is left *in situ* for about 3 weeks. This procedure is usually successful in allowing the canaliculus to heal without fibrosis and blockage of the lumen; it is an exasperating little operation and requires the patience of Job.

Summary

Only the commoner conditions leading to epiphora have been mentioned, but the knowledge of the mechanism of tear disposal will suggest other possibilities and their mode of correction.

To summarize then, there are 3 main causes of epiphora:

1. The punctum so misplaced or abnormal that tears do not enter the canaliculus.
2. The passages, canaliculus, sac, or naso-lacrymal

duct, obstructed by atresia, inflammation, neoplasm, trauma or foreign body.

3. An obstruction at the inferior meatus of the nose.

LACRYMATION

Excessive lacrymation is not as common as epiphora. It often occurs intermittently, when it gives rise to social and cosmetic embarrassment. The etiology is varied and complicated:

(a) Primary lacrymation, due to direct disturbance of the lacrymal glands, is rare. The syndrome of Mikulicz comes to mind, and it may be an early sign in the rare cases of tumour or cyst of the gland.

(b) Psychic lacrymation, of central origin, can sometimes become pathological but requires no elucidation here.

(c) Neurogenic lacrymation is the reflex weeping brought about by irritation of nerve endings which, often by most devious and ill understood pathways, connect with the gland. Of these reflex trigeminal irritation is by far the most important. Almost any affection of the eye or conjunctiva leads to lacrymation, but irritation of any branch of the fifth nerve can excite it.

Eye-strain and excessive accommodative effort are a potent cause of lacrymation and seem also to sensitize the eyes to bright light, so that the bilateral watering of reflex visual irritation becomes excessive. However, stimuli affecting any one of the cranial nerves, other than XI and XII, have been responsible for lacrymation, as is exemplified by the rare syndrome of 'crocodile tears'; here, after a lesion of the geniculate ganglion, weeping on the paralysed side accompanies the eating of food, more particularly if this is appetizing. The explanation envisages that some regenerated nerve-fibres have gone astray and entered the wrong nerve-sheath. Again, weeping accompanying chewing, a less rare anomaly, may be due to a pathological process involving the temporo-mandibular joint, the reflex excitation occurring *via* the auriculo-temporal nerve.

All this is fascinating, perhaps more so than the rather prosaic study of epiphora, but its clinical import is slight compared with that of the latter, and in most cases the symptom is secondary.

Symptomatic lacrymation has been noted in the course of some general diseases. In tabes it forms an important feature of the ophthalmic crises occurring usually in the pre-ataxic stage—presumably a central lesion. Thyrotoxicosis may, for mechanical reasons, cause weeping, but its advent before the appearance of exophthalmos indicates that this is not the sole cause.

Treatment, as always, depends on the cause. Excessive eye-strain or a chronic irritative conjunctivitis or even keratitis may require careful examination before it can be diagnosed; irritation in the nose, polyps, a deviated septum, etc., need to be excluded.

When no cause is found, and this is not very uncommon, attempts can be made to reduce the output of the lacrymal gland. Extirpation of the palpebral lobe of the gland can be carried out or, though I have not found this to effect more than a temporary cure, either

alcohol injection into the gland or cauterization of the ducts which empty into the conjunctival fornix at the upper outer angle. The risk of extirpation is, of course, a dry eye, and this is so much worse than a wet one that the procedure is only rarely undertaken.

The conservative treatment, which is surprisingly useful in mild cases, is the application of astringent drops; zinc sulphate is the usual choice, and together with adrenaline is one of the most widely used and satisfactory medicaments in the oculist's armamentarium.