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LACHRYMAL OBSTRUCTION  
AND  
ITS TREATMENT.

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## LACHRYMAL OBSTRUCTION AND ITS TREATMENT.

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THE proper performance of the function of drainage is indispensable to the health of the eye. Interruption in the exercise of this function becomes a source of discomfort or danger, with results varying from simple lachrymation to abscess, fistula, or at times destructive disease of the eye itself. Such interruption, when it occurs, therefore, demands careful consideration and efficient treatment.

Beginning at the puncta lachrymalia, the starting-point of the lachrymal drainage system, there are certain points at which, chiefly for anatomical reasons, obstruction is most apt to occur. These points are: 1, the puncta and canaliculi; 2, the point of junction of the lachrymal sac and nasal duct,—by far the most common of all; and, 3, rarely, the termination of the nasal duct in the nose.

Disease or displacement of the puncta may give rise to an overflow of the tears, the result of a faulty mechanical relation of the channel entrance with the front of the eye. In this respect the lower punctum is of greater importance than its fellow, owing to the gravitation of the tears.

Two abnormalities of the puncta are met



with,—displacement and, much more rarely, obliteration.

Normally in close apposition with the eyeball, the puncta may be displaced as the result of chronic disease of the margin of the lid leading to displacement of the lid, as a whole, from ectropium and entropium, and indeed from any condition which mechanically draws or allows the lid to fall away from the globe. A temporary displacement is occasionally produced by acute inflammation of the conjunctiva, with attendant swelling, forcing the lid away from its proper position.

Displacement of the puncta may occasionally be remedied by treatment directed to the condition originally causing the malposition. Thus, if the displacement be due to entropium or ectropium, relief of such a condition tends to restore the punctum to its normal position. Usually in displaced puncta, however, direct surgical interference is necessary. This consists in artificially restoring the communication between the conjunctival sac and the canaliculus by slitting the latter to a greater or less extent, care being taken to make the slit towards the inner margin of the lid, so as to bring the new entrance in contact with the globe. In some cases all that is required is to enlarge the punctum in an antero-posterior direction; in others, it is necessary to slit the canaliculus throughout its entire length. The wound thus made should be kept from reuniting by probing for a few days.

Obliteration of the puncta is observed occasionally as the result of traumatism or disease; very rarely are they congenitally absent. In all such cases an effort is to be made to reach

the canaliculus *de novo*, and the lumen having been found, the canaliculus is to be laid open, as before described.

In the majority of cases of lachrymal obstruction it is to be emphasized, that the immediate source of mischief is found within the canal below the sac, at the point of junction of the sac and duct. The obstruction at this point is most commonly due, in the first stage, to thickening of the membranous canal—which is normally narrowed there—from congestion or inflammation of the duct. The inflammation in many, perhaps most, cases is consecutive to disease within the nasal fossæ, in others it follows some form of conjunctivitis; the lachrymal canal being open at both ends, offers a ready means of invasion by pathogenic organisms from the nasal cavity and from the conjunctival sac.

The results of obstruction to the escape of the tears are various, the most serious usually being inflammation of the lachrymal sac, dacryocystitis. Abscess of the sac occasionally occurs, and this at times results in a permanent fistula, or the inflammatory process may be less violent, appearing as a chronic mucocele, subject to acute exacerbations.

Lachrymation with regurgitation of a small amount of clear fluid occasionally accompanies acute rhinorrhœa, dependent upon swelling of the soft parts within the bony canal, causing obstruction; in such a case the swelling may subside and the obstruction vanish, or the inflammation may become chronic and result in a permanent stricture. The diagnosis of obstruction below the sac is made by exerting pressure over the region of the sac and noting whether

regurgitation of fluid takes place into the eye through the puncta. If such is the case, obstruction is shown to exist somewhere in the course of the drainage system below the sac; otherwise the pressure would force its contents onward through the duct into the nose. Regurgitation of pus, when it occurs, is usually indicative, if not pathognomonic, of organic stricture, which, as has been said, will usually be found at the junction of the sac and duct.

Epiphora, it should be borne in mind, is not always a sign of obstruction. True it is that lachrymation commonly results from obstruction, but in rare instances the overflow is due to hypersecretion from disease of the lachrymal gland, or to an irritation affecting the nasal mucous membrane, or it may be from inflammatory disease of the eye.

The retention of tears in the conjunctival sac is in itself a source of irritation and not infrequently productive of inflammations of considerable severity. The presence of pus due to regurgitation, however, is a source of much greater disturbance, at times leading to infection of the cornea, resulting in ulcer, abscess, or pannus, and rendering operations on the eye especially hazardous.

In an important group of cases the lachrymal obstruction is due to and kept up by intranasal disease, and in these treatment of the naso-pharynx must precede any operative measures on the passage from above.

Such success has, particularly in recent times, attended the nasal treatment of this disorder that in practice it has become necessary to draw a line between those cases of epiphora which properly fall within the province of the oph-

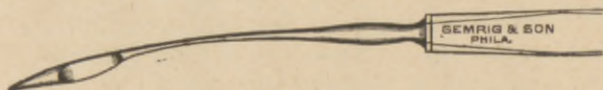
thalmologist as distinguished from those falling within the province of the rhinologist. To the latter belong those cases, especially recent ones, coming on in the course of catarrh or accompanying the various forms of rhinitis with regurgitation of tears, mingled, perhaps, with flocculi of mucus, and all cases showing signs of obstruction of the nares. In short, every case of epiphora presenting symptoms of any nasal affection whatever should be subjected to rhinoscopic examination. To the ophthalmologist are to be assigned those cases of epiphora due to organic stricture of whatever origin, and which are usually characterized by regurgitation of pus. Where, in recent cases, there is reason to believe that the obstruction is caused by simple swelling, and organic stricture has not yet formed, as is more certainly ascertained if injections through the puncta can be made to reach the nose and pharynx, we may occasionally succeed in giving relief without operation, by constitutional treatment, reinforced by local counter-irritation over the sac, as by iodine paint applied between the canthus and the bridge of the nose.

In acute dacryocystitis the lower canaliculus should be laid open, and at the same time an opening is to be made in the wall of the sac sufficiently large to allow free drainage of its contents. *Poulticing should be avoided*, inviting, as it does, the formation of pus and encouraging its evacuation through the cheek, with danger of a permanent fistula.

The usual method of treating lachrymal obstruction within the duct heretofore practised has been by probing. The text-books describe this method at length, and hardly ac-

cord more than passing mention to any other. This method, it should be said, requires an indefinite length of time, is trying to both patient and surgeon, and is notoriously unsatisfactory in its results, recurrence being the rule almost as soon as the probing is omitted.

In a paper read before the Ophthalmic Section of the American Medical Association in 1892, and published in the journal of the Association, I described a method of internal stricturotomy, based upon that of Stilling, with a knife devised by me for that purpose. This stricturotome is a combined conical dilator and knife with a long flexible shank. The conical tip serves as an explorer, guide, and



dilator for the knife of which it is the prolongation, and also serves as a protector to the soft parts during the introduction and withdrawal of the instrument. It is to be borne in mind that in all manipulations within the canal great care must be exercised—just as in the treatment of stricture of the urethra—to avoid making a false passage.

The first step in operating consists in slitting the canaliculus, usually the lower. This can be most readily done with a small grooved director and Beer's knife. I have recently had made a modification in this knife in which the edge of the blade is ground down parallel with the back, beginning about one-quarter of an inch back from the point, the angular extremity only being sharpened. In making the incision



two points are to be particularly observed: the cut should be made along the inner edge of the margin of the lid, by causing the edge of the knife to be directed somewhat backward towards the globe, in order that the groove may be favorably located to receive the tears; secondly, the opening into the sac must be made sufficiently large to permit the ready and free introduction of the necessary instruments and to insure an ample outlet for the tears. This result may be best accomplished with the point of the knife cutting in an upward direction before withdrawing the director. An obstructing ledge of tissue is usually found at the inner extremity of the groove formed by the floor of the canaliculus, and which offers an impediment to the passage of instruments and even of the tears. This obstruction is to be divided later by the stricturotome during its withdrawal at the close of the operation.

A curved probe is now to be introduced with its concavity outward as well as forward, and the location and calibre of the stricture determined.\*

The probe being withdrawn, is replaced by the stricturotome, well oiled, special care being taken to place the point of the instrument within the grasp of the stricture, when gentle, continuous pressure is to be made, the cone and blade being carried through and beyond the coarctation. Extreme delicacy and patience should be exercised, and more than one sitting may be required to complete this stage of the operation.

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\* Bowman's probes are much improved by being furnished with conical tips. Where smaller sizes than five millimetres in circumference are required, the bulbous probes of Williams, of Boston, should be used.

The incision is made by a drawing movement upward, *completely dividing the tissues at the strictured point*, even to the bone, and in at least two different directions. There is usually but slight bleeding, and, especially with cocaine, the pain is inconsiderable. Except in young children, it is not necessary to employ an anæsthetic.

The after-treatment consists in the introduction of a large leaden style, eight to ten millimetres in circumference, inserted at once after division of the stricture. The upper extremity of the style is bent at a right angle, and so reduced in size as to drop into the groove formed by the divided lower canaliculus, where it lies concealed. This is removed at first every day or two to allow the passage to be washed. At the end of a few weeks the style may be left out.

The use of the style is, however, not essential; thorough division of the coarctations may alone suffice; but experience in after-treatment, with and without the style, leads me to believe that while success is likely to attend both methods, the use of the style is, on the whole, to be preferred.

A case of obstruction treated by incision and the use of the style ordinarily recovers at once. The style may be worn for a few weeks more or less, but this is a matter of indifference to the patient, who is not aware of its presence when it is properly in place. *Probing for purposes of dilatation is never required after a successful operation.*

The advantage of stricturotomy over long-continued probing, as also over divulsion by extremely large probes, which is occasionally

practised, both of which, at best, demand prolonged and painful treatment, is that *stricturotomy promises immediate and permanent relief with the minimum of pain and discomfort to the patient and of trouble and annoyance to the surgeon.*

So entirely satisfactory have been the results of treatment by this method during an experience with it of more than twenty years, that I feel warranted in stating my belief that stricturotomy is worthy to be substituted for all other instrumental procedures now in use for the treatment of stricture of the lachrymal duct.

In connection with this operation I wish to show a set of leaden lachrymal sounds. These



Two-thirds natural size.

sounds are intended for use in connection with lachrymal stricturotomy as explorers and pilots,—explorers as to the result of the operation, and as pilots for the introduction of the style. They are made of lead, rendering them sufficiently flexible to adapt themselves, to a certain extent, to the conformation of the canal, and so furnish an index as to the proper curvature and direction to be given to the style. They are provided with conical tips of the form which has been found so useful in steel urethral sounds, favoring their safe and easy introduction, and are readily controllable by reason of the suffi-

cient handle. They are made in four sizes,—seven, eight, nine, and ten millimetres in circumference. A sound larger than ten millimetres is never required, and this is not so large as to endanger the bony walls by reason of its size.



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