CHAPTER V.

DISEASES OF THE LACHRYMAL PASSAGES.

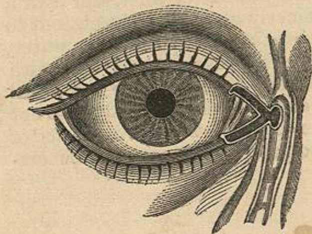
Displacement and obstructions of the puncta and canaliculi—Inflammation of the sac—Obstruction of the nasal duct—Defective secretion of lachrymal gland—Epiphora—Lachrymal cysts and fistulæ.

OBSTRUCTIONS IN THE PUNCTA.

Position of in health.

DISPLACEMENT AND OBSTRUCTIONS OF THE PUNCTA.—In the healthy eye, the lachrymal puncta are in contact with the eyeball, and cannot therefore be seen unless the eyelids are everted. When the eye is closed, the puncta are situated in the lacus lachrymalis, so that the secretion from the surface of the conjunctiva, whether the person is sleeping or waking, can always drain away through the puncta into the canaliculi, lachrymal sac, nasal duct, and so down into the nose. (Fig. 18.)

FIG. 18.



Effects of obstruction;

lachrymation,

Any cause which displaces the puncta, or which obstructs the passage of the tears into the nares, gives rise to an accumulation of the lachrymal secretion in the lacus lachrymalis, which in time overflows, and running down the cheek, causes the patient considerable inconvenience.

Not only is lachrymation thus induced, but a tear is left constantly hanging in front of the cornea, and by interfering with the rays of light in their passage to the eye, renders it necessary for the patient to be per-

petually wiping his eye before he can see clearly; and lastly, the prolonged contact of the tears with the surface of the eye gives rise to chronic conjunctivitis and its consequences.

conjunctivitis.

Causes; inflammation,

The most common cause of obstruction to the exit of the conjunctival secretion is inflammation of the lining membrane of the lachrymal passages, producing a stricture in some part of their course. The same effect, however, is brought about if the puncta are prevented from maintaining their normal position, either by the margin of the lids becoming thickened, as in tinea, or from an hypertrophied state of the conjunctiva. Obviously, the same effect will follow ectropium, however induced. On the other hand, it not unfrequently happens that the puncta are too much inverted, when, as in old age, the eye becomes deep sunk into the orbit.

eversion,

inversion.

Obstruction of the lachrymal puncta may be either partial or complete—that is, one or both the puncta may be closed, giving rise to symptoms such as I have above described.

Diagnosis by pressure over the sac,

I mentioned in the first chapter, that if in the healthy eye, pressure were made over the lachrymal sac, a drop of fluid might be observed to ooze out through the lachrymal puncta. Should one or both of them, however, be occluded, it necessarily follows that no fluid can be made to regurgitate through the obstructed orifice. Under these circumstances also we shall find it impossible to pass a probe into the canaliculus. There can, therefore, be no difficulty whatever in arriving at an accurate diagnosis in a case of this kind; and the line of treatment to be followed is no less simple, our efforts being directed to restore the communication between the eye and the nares.

and use of a probe.

Treatment.

Treatment.—Even in cases of congenital deficiency of the puncta, the normal situation of the opening may generally be detected, a small spot or depression near the inner extremity of the palpebral margin indicating its position; and it by no means follows that because the puncta are closed, the canaliculi are also occluded; so that, in some instances, all that is necessary is, simply to cut through the membrane closing the passage into the canaliculus, and keep it open by passing a probe through the passage daily, till the edges of the incision have cicatrized; after which there is but little

In complete closure,

chance of their growing together, and again obstructing the passage of the tears into the canaliculus.

The lid in which the punctum to be operated on is situated (whether upper or lower) having been everted, a sharp-pointed instrument is to be run through the obstruction in the direction of the canaliculus, the punctum being laid freely open. If a full-sized lachrymal probe can then be passed through the canaliculus into the lachrymal sac, there will be no necessity for any further treatment, beyond the insertion of the instrument through the incision every day, for four or five days, to prevent its edges from uniting.

pierce the membrane.

Pass a probe daily.

Supposing we cannot make out the seat of the punctum, it is well to cut across the line of direction of the canaliculus, and then pass a grooved lachrymal director along this canal into the lachrymal sac, slit up the canaliculus throughout its length, and thus leave a free passage for the tears into the sac.

Partial obstructions,

It by no means follows, however, that the puncta are always either completely occluded, or else of their normal calibre; they may be obstructed to any extent between these two extremes, being so far contracted that it is difficult for the lachrymal secretion to find its way through them, in sufficient quantities to keep the corner of the eye free from an accumulation of fluid. Under these circumstances, a very fine probe may be passed through the punctum, and under the guidance of the instrument its inner and upper wall may be incised, and subsequently kept dilated as above described.

similarly treated.

STRICTURE OF THE CANAL.

Permanent.

Causes.

OBSTRUCTION OF THE CANALICULUS may be permanent or spasmodic. A permanent stricture, whether partial or complete, will give rise to the same symptoms as occlusion of the puncta, and for the most part it arises from a similar cause—namely, chronic inflammation of the mucous membrane. A foreign body, as, for instance, a cilium or calcareous concretion, occasionally closes the canal.

The existence of a stricture of the canaliculus is determined by passing a probe through the punctum, when its further passage towards the sac will be prevented by the obstruction.

Caution in using probes.

Particular care should always be taken in exploring the canaliculus; a probe roughly thrust through it may, by wounding the mucous membrane, induce a

permanent stricture, even in cases where the obstruction is entirely of a spasmodic character, or arising merely from a congested state of the mucous membrane.

Spasmodic stricture.

Spasmodic stricture of the canaliculus occurs either at the inner or outer opening of the canal, and the watery eye accompanying it may be of an intermittent character, depending on relaxation at one time and spasm at another of the constrictor muscle. There is never the same resistance to the passage of an instrument in cases of this kind through the canaliculus as in instances of permanent stricture.

Treatment.

Treatment.—Unless the obstruction is of some standing, attempts should hardly be made to pass an instrument, as the stricture may arise simply from congestion of the lining membrane of the canal, and astringents will cure it; whereas the injudicious use of a probe, by wounding the mucous membrane, may cause a permanent obstruction. On the other hand, if the patient has complained of symptoms of occlusion of the lachrymal passage for some two or three months, it is better, under any circumstances, to operate at once. Old-standing cases of obstruction, from whatever cause they arise, seldom improve under local applications, and the sooner the canaliculus is laid open the better. In practice, however, we so generally find that with obstruction of the canaliculus the nasal duct is also affected, that I now think it better, while opening the former canal, to divide any stricture in the duct, so as to prevent the necessity for a double operation.

If recent, delay interference.

In old cases operate at once.

1. If incomplete,

1. If the stricture is not complete, a fine grooved director may be passed through it into the lachrymal sac, and an assistant having everted and drawn the lids outwards, a knife must be run along the groove, so as to lay the punctum and canaliculus freely open from end to end. The edges of the incision should subsequently be prevented from uniting, by passing a probe through the wound into the sac every day for a week, after which the channel will remain permanently open, and the lachrymal secretion pass through it into the sac. Care must be taken in this operation to turn the groove of the director inwards, or towards the eye, so that the incision will be in apposition with the eyeball; otherwise the tears will not be able to find

open the canal on a director.

Pass a probe daily.

their way into the canal from the surface of the lacus lachrymalis.

Mr. Bowman's operation.

Slitting the canal.

Mr. Bowman describes the above operation as follows :*—The patient sits in a chair, and leans his head against the chest of the surgeon, who stands behind and bends over him. For dividing, for example, the left lower punctum, the ring finger of the left hand is placed on the skin over the lower edge of the orbit, and fixes it there, while tightening or relaxing the lower canal by a sliding movement of the skin upon the bone, the punctum being at the same time everted. The right hand now inserts No. 1 probe while the canal is relaxed, and then places the probe between the index finger and thumb of the left hand, which holds it in the canal, and further everts the punctum by turning the probe downward on the cheek, while the ring finger stretches and fixes the canal by a sliding movement of the skin outwards, towards the malar bone. A fine, sharp-pointed knife, held in the right hand, now slits up the canal on the everted conjunctival aspect, from the punctum, as far as the caruncle, and the probe is raised on its point out of the canal, to make sure that the edge of the punctum has not escaped division. Care should be taken not to slope this little incision obliquely through the tissues it severs, as there is then a broader surface exposed, and greater chance of union by the first intention. To avoid this, it is in all cases desirable to pass a probe across the line of incision, on each of the few ensuing days, to break through adhesions if they form. In some cases, after the canaliculus has been slit open, a small portion of the posterior lip of the wound, near the caruncle, should be taken up with forceps, and removed with scissors, particularly if there is much thickening of the lower lid ;† when the puncta are everted, as in ectropium, the incision must be directed well inwards, so as to be in contact with the eyeball, in order that the lachrymal secretion may drain away through it into the sac. Although Bowman's operation is simple enough, nevertheless, in practice it is often by no means an easy proceeding, particularly when we have a nervous patient to deal with; and of

Often difficult to manage.

* *Ophthalmic Hospital Reports*, vol. i. p. 15.
† Ibid., p. 103.

late I have almost abandoned the plan of passing a director into the canaliculus, and prefer the following proceeding. The position of the patient, the surgeon, and the part to be operated on will be as above described; but in place of passing a director along the canaliculus a very narrow-bladed knife with a minute probe-like point is to be passed through the punctum, and thrust along the canaliculus ; so soon as the point of the instrument touches the inner wall of the lachrymal sac, the direction of the blade of the knife is to be changed from the horizontal to the vertical position; by this manœuvre, the eyelid having been kept lightly on the stretch outwards, the whole length of the canaliculus is divided, and the blade of the knife, without being withdrawn from its position, is to be gently thrust down along the inner wall of the sac and through the nasal duct into the nostril. This proceeding can be effected in very much less time than I have taken to describe it, and it will save subsequent trouble to pass a knife of this kind at once down the nasal duct, and any resisting structures are thus to be divided up to the bony wall of the canal, until the blade of the knife is felt to be free in the duct, and can be turned round or removed up and down without encountering resistance. In the majority of cases, this operation will have to be done sooner or later, and under no circumstances can the proceeding do any harm. This operation is also well adapted for opening the upper punctum and canaliculus. It will be necessary during the subsequent treatment of the case to pass a full-sized lachrymal probe down the nasal duct every two or three days, so as to keep the passage dilated until mucous membrane lining it has healed. (*See Treatment of Fistula Lachrymalis.*)

Slitting the canal and duct open.

2. Supposing, however, that the stricture of the canaliculus is both complete and permanent, so that we cannot pass even the finest director along the canaliculus into the sac, it is evident that we must endeavour to effect another passage for the tears either through the upper canaliculus or from the lacus lachrymalis into the sac, behind the tendo palpebrarum.* The sac having been punctured from this latter direction, the opening must be maintained by passing a probe

2. In complete stricture.

Form a fistula to the sac.

* "Maladies des Yeux," par M. Wecker, tom. i. p. 786.

through it every day, so as to form a fistula between the inner angle of the eye and the lachrymal sac.

Streatfeild's operation.

Mr. Streatfeild's operation may be practised with success in cases where, for instance, the lower punctum is so completely closed that we cannot even recognise its position; he recommends under these circumstances that the upper punctum and canaliculus be divided, and through this opening a fine bent director be passed into the inferior canaliculus, and if possible through the lower punctum; if not the lower canaliculus can the laid open, directed by the probe that has been inserted into it. The converse operation may be performed for closure of the upper punctum.*

Phlegmon of the Sac.

Phlegmon of the Lachrymal Sac is attended with great pain, and often gives rise to fever and considerable constitutional disturbance. Phlegmon of the sac commences as a small, hard, and painful tumour, situated at the inner angle of the eye; as the inflammation advances, the skin covering the sac becomes

Pain and swelling.

tense and shining, the swelling extending to the cheek and eyelids, which often become so œdematous that it is impossible to open them. At first sight such a case may resemble one of purulent conjunctivitis; the absence, however, of a purulent discharge from the eye, and the excessively painful spot at its inner angle, sufficiently indicate the nature of the disease.

Abscess.

If the inflammatory action runs on unchecked, suppuration takes place, and fluctuation may be felt over the region of the sac; the matter points outwards, and ultimately discharges itself through an opening in the skin. The inflammation then subsides, and the parts may return to their normal condition. But it too often happens, if the disease is allowed to take its course,

Fistula.

that it terminates in fistula lachrymalis. This perhaps closes, and an abscess again forms, so that gradually the mucous membrane lining the sac and nasal duct is

Nasal passage closed.

partially or completely destroyed, and the passage of the tears into the nose permanently closed.

Occasionally caries or necrosis of the lachrymal bone follows as a consequence of an abscess of the lachrymal sac. More frequently, however, complications of the

* *Ophthalmic Hospital Reports*, 1860, p. 4.

kind are only met with among scrofulous and syphilitic patients. Phlegmon of the lachrymal sac is by no means an uncommon starting-point for erysipelatous inflammation of the face, extending in all probability to the scalp.

Treatment. **Arg. nit.**

Treatment.—In the early stages of this disease, it is advisable to paint the skin over the inflamed sac with a strong solution of nitrate of silver, and ice or cold compresses may be constantly applied to the part. I never use leeches in cases of this kind, especially among hospital patients; they often do more harm than good.

Poultices.

If suppuration has actually commenced, a poultice should be applied over the abscess, and changed every second hour. Supposing the fomentations do not relieve the abscess, so far as to enable us to evacuate its contents through the natural passage by pressure over the sac, we should at once run a probe pointed knife through the punctum and canaliculus into the sac.

Open abscess internally,

If the abscess cannot be opened in this way, the lids should be separated as far as their swollen state will permit; and a cataract knife should be passed with its flat side against the eyeball, and thrust into the tear-sac, in the depression existing between the commissure of the lids and the caruncle. This point can generally be easily reached, especially when the sac is distended with fluid. By this means the abscess is opened and at the same time you save an external wound. In some few instances the swelling of the parts is so great, that it is almost impossible to open the abscess by either of the methods above described,

or through the skin.

and under these circumstances it is necessary to make an incision directly into the most prominent point of the abscess; its contents are evacuated, and the wound treated antiseptically.

In spite, however, of all our care, a fistula may form between the sac and the surface of the skin, through which there is a constant discharge of tears: the skin around the opening becomes thickened and excoriated, and from contraction of the integument ectropium may supervene, adding very much to the patient's discomfort.

Fistula Lachrymalis.

Fistula Lachrymalis.—Fistula of the lachrymal sac, as I have shown above, generally arises as a sequence of phlegmon and stricture of the sac. It

Causes.

may, of course, occur from injury or other causes, by which a communication is established between the skin and the sac, and it is often kept open by obstruction of the nasal duct, the lachrymal secretion passing through the puncta and out through the fistula, instead of into the nose.

Treatment.

Treatment.—This being the case, the first and most obvious aim in the treatment must be, to open, if possible, the normal passage for the tears into the nares, by dilating the nasal duct. This was formerly done by passing *a style** through the fistula into the duct, and retaining it there; the passage after a time becomes dilated, and the fistula heals. But the difficulty in this method is to retain the style in the duct; and although various ingenious contrivances have been invented for the purpose, they do not appear to answer, and the style has now been abandoned. In place of it, the lachrymal sac is opened, as I have before described, by slitting up the punctum and canaliculus and gently thrusting the blade of the knife through the sac into the nasal duct and down into the nares.

The "style."

Now little used.

If the surgeon is thoroughly acquainted with the anatomical relations of these parts, he will have but little difficulty in passing a probe through the sac into the nasal duct. The lid should be everted, and by stretching the canal, as before indicated in the operation for stricture, we avoid the risk of forcing a fold of the mucous membrane before the point of the probe, which would prevent the instrument from entering the nasal sac. The probe is then passed horizontally along the opened canaliculus until its extremity reaches the inner bony wall of the sac. The direction of the instrument is then turned vertically, as shown in Fig. 19, and gently passed down through the sac, its point being then directed a little outwards and forwards, it passes into the nasal duct and so reaches the nose.

Slit the canal and pass a probe into the nares.

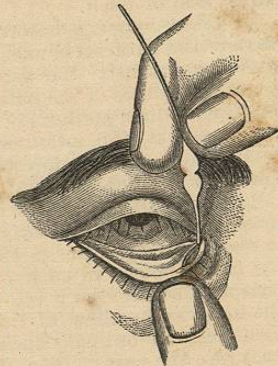
If the probe is arrested at the point where the canals coalesce and join the sac, the fact may be known by noticing that the skin near the tendo-oculi is moved when

Indications of stricture.

* A style is a small piece of silver wire, about one-twentieth of an inch thick, and one and a half inches long, having a neck bent at an obtuse angle with the shaft of the instrument, and terminating in a head.

the probe is moved, and an elastic resistance is experienced; whereas, if the probe has entered the sac, it hits against the inner bony wall, and the skin is motionless.* If we find an obstruction of this kind preventing the probe from entering the duct, the instrument must be withdrawn, or its point turned in different directions until the probe enters the duct; but should there be a decided obstruction at this point, the probe may be carefully forced through it, but this is hardly likely to be the case if the blade of the knife has previously passed along the canal. If there is much difficulty in passing the probe into the nasal duct, which may happen in chronic cases, the sac having much diminished in size, it is advisable to slit up the upper as well as the lower canaliculus, so as to leave a large opening into the sac, the internal palpebral ligament being freely divided, and by this means procure a free opening from above for the passage of the instrument down into the sac and duct.

Fig. 19.



Pierce obstructions.

The size of the probe to be employed will, of course, vary with the nature and extent of the stricture. As soon as the end of the probe touches the mucous membrane of the nose, the patient feels it there, so that there can be no mistake as to the passage of the instrument. I need hardly remark that it is very necessary to handle our instrument lightly, when endeavouring to pass the knife or a probe through a stricture in the nasal canal, otherwise we may run the instrument through the bony wall of the canal, and inflict a permanent injury on the part.

Using great caution.

In the case of stricture of the sac or nasal duct, com-

* Mr. Bowman on Lachrymal Obstruction: *Ophthalmic Hospital Reports*, vol. i. p. 16.

plicated with a lachrymal fistula, the probe should, if possible, be passed through the nasal duct about twice a week, until it is fully dilated. The natural passage of the tears being thus restored, the fistula will probably heal of itself.

It often happens, however, that all our efforts to restore the natural channel for the tears are ineffectual, and consequently the fistula remains open, to the great annoyance of the patient. To remedy this state of things, three methods of procedure are open to the surgeon—1st, the introduction of a style; 2nd, the obliteration of the lachrymal sac; and 3rd, removal of the lachrymal gland.

1. The style.

1. I have already spoken of *the style* as having fallen into disuse; but if the surgeon determines to employ it, the following is the method of doing so.* Should the fistula not be in such a position as to enable us to pass a probe through it into the nasal duct, it must be slit up so as to allow of this being done. We may then pass an ordinary lachrymal probe through the duct into the nares. The style may subsequently be introduced, and allowed to remain in the duct for two or three days, when it must be withdrawn, cleansed, and returned into the duct. In the course of time the canal becomes enlarged, and in the interim the tears find their way down into the nose along the sides of the style.

How used.

Objections to styles.

The cure, however, is a tedious one; and after all, when the style is permanently removed, the duct is very apt to contract again. But independently of the chances of a relapse, the irritation caused by the style is often so great, that people cannot possibly wear it; and lastly, the instrument frequently slips from its position, and the patient cannot return it into the nasal duct. Consequently, the method of treating a fistula by means of a style is not a promising one, and is certainly surpassed by either of the other proceedings now to be described.

2. Obliteration of the sac.

2. Obliteration of the lachrymal sac, in cases of fistula, has been advocated by Dr. Manfridi,† of Turin. The lachrymal sac must be laid completely open, and, if necessary, the tendon of the orbicularis cut

* "Maladies des Yeux," par L. A. Desmarres, tom. i. p. 369.
† *Ophthalmic Review*, vol. ii. p. 418.

through to expose the superior end of the sac. Manfridi then introduces a speculum into the wound, and the sac is to be carefully cleansed of blood and matter; after which its entire surface is to be smeared over with chloride of antimony. A piece of dry lint is to be placed in the cavity, over which poultices may be applied, our objects being "the total destruction and extrusion of the sac, without which we cannot hope for a complete and permanent result." After the destruction and enucleation of the sac in this way, "a channel of communication sometimes still exists between the lachrymal conduits and the nasal canal."

By chloride of antimony

Mr. Windsor, of Manchester, prefers, after completely laying open the lachrymal sac, to fill it with dry lint, allowing the lint to remain in the sac for two days. It is then removed, and the walls of the sac having been thoroughly cleansed, the cavity is to be filled with lint soaked in the chloride of zinc paste, which should be allowed to remain in the sac for two hours. The lint may then be removed, and water-dressing applied. The sac sloughs, and comes away in the course of a few days, and the wound rapidly heals.

or chloride of zinc.

3. Removal of lachrymal gland.

3. Lastly, removal of the lachrymal gland, for the cure of a fistula of the lachrymal sac, has been practised by Mr. J. Z. Laurence with success.* (See page 81.)

CHRONIC INFLAMMATION OF THE SAC.

Chronic Inflammation of the Lachrymal Sac is a common form of disease. It usually commences with subacute inflammation of the lining membrane; but the irritation extending to the mucous membrane of the canaliculus and nasal duct, these passages become swollen and obstructed, and the sac is slightly distended in consequence of the accumulation of mucus within it. Under these circumstances, if pressure be made over the sac, a whitish, glairy fluid may generally be forced through the puncta. The lachrymal secretion cannot pass through its natural channel, and accumulating in the inner corner of the eye, it runs down over the cheek, giving the patient constant annoyance; he seldom complains of pain in the part, but is occasionally troubled with an itching sensation in the region of the sac.

Mucus collects in the sac.

Lachrymation.

No pain.

Chronic inflammation of this kind may exist for

* *Ophthalmic Review*, vol. iii. p. 138.

months, without either increasing or receding; but at any time acute inflammation may supervene, and an abscess of the sac and fistula result.

Abscess may form.

Treatment.

Treatment.—It is advisable, as soon as possible, to open the sac by slitting up the punctum and canaliculus, and to run the knife down through the nasal duct; subsequently the edges of the wound should be kept apart till they have healed, so as to establish a permanent opening into the sac, and a probe will have to be passed, to keep up a free communication into the nares; the patient should make pressure with his finger over the inner corner of the eye three or four times a day, so as to empty the sac. This done, the sac gradually contracts: the mucous membrane takes on a more healthy action, and the disease is cured. The recovery is expedited by syringing out the sac once a day with an astringent lotion (two grains of alum and two of sulphate of zinc to an ounce of water), after having pressed out the contents of the sac; the lotion may be injected with an Anel's syringe. It is advisable to continue this application for some time after all symptoms of the inflammatory action have disappeared.

Open the sac.

Keep it empty.

Inject astringent lotions.

MUCOCELE.

MUCOCELE consists in an accumulation in the lachrymal sac of its normal secretion, the nasal duct being almost always occluded, and in the majority of cases there is also more or less obstruction in the canaliculi, a watery eye results, and the sac becoming distended, a small tumour forms at the inner angle of the eye, its size varying from that of a split pea to a pigeon's egg. The patient complains of little or no pain in the part, and the skin over the sac is not inflamed. During the early stages of the disease fluctuation may be felt in the sac, but as it becomes more distended and tense, it feels harder, and might possibly be mistaken for a fibrous growth. The canaliculi and nasal duct being occluded to a greater or less extent, it generally requires firm pressure to be made over the mucocele before its glairy contents can be forced out through the puncta.

Mucus collects in sac.

Forms a firm tumour.

Treatment.

Treatment.—The sac having been opened through the canaliculus, it will then be necessary to dilate the obstruction in the nasal duct as I have already described; for it must be remembered that both the upper and lower openings into the sac are for the most part closed in cases of mucocele. These obstructions having both been overcome, we may hope to restore the passage of the tears into the nose, and thus effectually cure the disease.

Remove the obstructions.

POLYPI AND CONCRETIONS IN THE SAC.—A polypus has been known to grow from the lining membrane of the lachrymal sac. Calcareous concretions also may form in it, obstructing the passage of the tears into the nose. A polypus in this situation is a very rare form of disease; it induces symptoms similar to those of mucocele, but the tumour feels less elastic to the touch, and of course no fluctuation can be felt in it. If there is any doubt on the subject, a grooved needle may be run into the tumour and its character ascertained with certainty.

POLYPI AND CONCRETIONS.

The nature of the obstruction, if arising from calcareous matter, may be at once ascertained by passing a probe into the sac; the contact of the instrument with the sandy particles, accumulated either there or in the canaliculus, cannot be mistaken for any other condition of the parts.

How distinguished.

In cases of this kind the canaliculus and sac must be laid open, and the calcareous matter turned out of them. The same remark applies to the treatment of a polypus; but in this case the tissues covering the sac must be divided, and the polypus carefully removed, together with its peduncle, otherwise it will certainly grow again.

Treatment.

By careful removal.

OBSTRUCTION OF THE NASAL DUCT.—The nasal duct sometimes becomes partially, or it may be wholly obliterated, most commonly from chronic inflammation and thickening of the lining membrane; but it may be from periostitis, or disease of the bones forming the walls of the lachrymal duct.

OBSTRUCTION OF NASAL DUCT.

The symptoms caused by obstruction of the duct are, dryness of the corresponding nostril, the formation of a slight, painless, and elastic swelling in the position of the lachrymal sac, and a constant overflow of tears from the eye. By pressure over the region of the sac, we may determine whether the obstruction is in the nasal duct, or between the puncta and the sac; if the latter, there will be no regurgitation of muco-purulent fluid through the puncta; but if the stricture be in the nasal duct, though the symptoms above enumerated exist, the lachrymal secretion will find its way into the sac, and on pressure being made over it,

Swelling of the sac. Lachrymation.

Regurgitation by puncta.

a drop of fluid will ooze through the puncta. If the stricture is not complete, part of it may find its way down into the nose.

Treatment.

The treatment of stricture of the nasal duct has already been described, page 140. It consists of opening the canaliculus and passing a narrow-bladed knife and subsequently a full-sized probe down through the lachrymal sac and the obstructed duct, so as to dilate the passage. The probe should not be passed more than once or twice a week, but the dilatation of the passage frequently requires much patience, on the part of the patient, and the surgeon also.

Dilate the passage.

Should the obstruction be a bony one, which is very rare indeed, compared with the number of cases that occur from thickening of the mucous membrane, we are not likely to cure it with the probe; it might then possibly be necessary to destroy the lachrymal sac, and perhaps to remove the lachrymal gland, though I have never had to perform an operation of the kind for cases of this description.

Destroy the sac.

Inflammation of the Angle of the Eye, simulates abscess of the sac.

Inflammation of the Internal Angle of the Eye.—An abscess in this situation may lead to the erroneous supposition that the sac itself is involved in the mischief. That such cases occur is certain, for we see abscesses form and burst in this situation without the lachrymal apparatus being in any way compromised. In instances of this description, the abscess comes on without any symptoms of previous disease of the lachrymal sac; the inflammation sets in suddenly, and is not uncommonly attended with erysipelas, especially if the patient is in a weak state of health. The eyelids become much swollen, and lachrymation may exist from pressure of the abscess on the lachrymal sac. After a few days suppuration occurs, and the abscess points; a small quantity of pus escapes, and in a short time all traces of the disease disappear.

Often erysipelatous.

Treatment.

Arg. nit.

Treatment.—In the early stages of the disease we may paint the skin over the sac with a strong solution of nitrate of silver. Subsequently, if suppuration has taken place, the abscess must be opened and poultices applied till pus ceases to be formed. The wound heals, and the parts speedily return to their normal condition.

Poultices.

Deficient Tears.

Deficient Secretion of Tears.—I have already noticed, page 80, some of the diseases to which the lachrymal gland is liable; but we occasionally meet with cases in which, without any apparent cause, the gland ceases to secrete. I had a lady under my care same time ago, who never knew what it was to shed a tear; she was unable to cry because the lachrymal gland never secreted any tears. In this case the patient did not suffer from dryness of the eye or other inconvenience, as is sometimes the case in affections of this kind. We can hardly expect to be able to rouse the lachrymal gland to action under these circumstances, but we may be able to relieve the symptoms of dryness of the eye to which it occasionally gives rise, by applying a dilute solution of potash to the conjunctiva three or four times a day; a few drops of liquor potassæ to an ounce of water will be about the strength required.

Eye may or may not be dry.

Potash lotion for.

Epiphora.

Epiphora is just the opposite condition to the above; the tears are secreted in such large quantities that they cannot find their way down through the puncta, and collecting in the corner of the eye, they overflow and run down the cheek. There is no fault whatever with the lachrymal passages, but simply an excess of tears formed by the gland.

Excess of tear

Temporary epiphora, for instance, is induced by the presence of a foreign body on the surface of the cornea, or it arises from irritation in some other part of the body—as, for instance, from intestinal worms, or from teething. As a general rule, it is to these exciting causes we must direct our attention; by removing them the lachrymal gland will resume its normal functions, whereas the application of blisters to the temple, and all local remedies, will be perfectly futile.

If temporary, remove cause.

In cases of a more permanent kind, where our endeavours have failed to afford relief, we are justified in excising the lachrymal gland. The watery eye, on the one hand, is a constant source of trouble to the patient, and on the other, the removal of the gland is attended with no further inconvenience than that caused by the necessary incisions. These will probably heal in a week or ten days, and leave the patient quite unconscious of his loss, except under circumstances of emotional disturbance; and this deficiency of tears is more than compensated by the prevention of their overflow. Nor will the eye be left absolutely dry, for

If permanent, remove gland.

although the lachrymal gland is removed, a considerable quantity of watery fluid is still secreted by the subconjunctival glands, which keeps the mucous membrane moist, independently of the secretion from the lachrymal gland.

LACHRYMAL CYSTS.

LACHRYMAL CYSTS (Dacryops) commence as small tumours in the upper and outer part of the eyelid, extending backwards, beneath the border of the orbit, towards the lachrymal gland. "If the lid be drawn up on to the brow, and pressure be simultaneously applied in a downward and inward direction, a tense, elastic, fluctuating swelling instantly starts out between the eyeball and the inner surface of the eyelid."* As the tumour increases in size, the movements of the eye become restricted, and it may even cause exophthalmos. If the patient cries, the tumour suddenly enlarges; this is a very characteristic feature of the affection.

Appearance. *Impede the eye.*

Arise from obstructed ducts.

This rare form of disease, as Mr. Hulke states, depends for the most part upon obstruction of one or more of the lachrymal ducts, in consequence of a neglected abscess or wound of the eyelid. The tears, being prevented from escaping, collect behind the point of stricture and cause the dilatation of the duct above described.

To be opened from within.

Treatment.—A permanent opening must be made into the cyst from the inner surface of the eyelid, the tears can then pass away over the eye. If the opening is made externally through the skin of the eyelid, a very troublesome fistula may result.

FISTULÆ.

FISTULÆ OF THE LACHRYMAL GLAND occasionally form as the result of an abscess or injury of the gland. A fistulous opening leading to the lachrymal gland having formed, it may be in the skin of the upper eyelid, a clear fluid discharge constantly drains away through it over the skin of the lid, and a probe may be passed through the fistula in the direction of the lachrymal gland. In a case of this kind it is advisable to pass a probe along the course of the fistula, and then, having everted the eyelid, to cut down

Open from within.

* Mr. J. W. Hulke on Dacryops Fistulosus: *Oph. Hosp. Reports*, vol. i. p. 285.

through the conjunctiva on to the probe, and in this way create another fistulous opening on the palpebral conjunctiva, so as to conduct the lachrymal secretion to its proper destination. The actual cautery should then be applied to the mouth of the fistulous opening on the outer surface of the eyelid, in the hope that the inflammatory action thus excited may, on the separation of the little slough caused by the cautery, close the external fistula. All other means of treatment having failed, it may be necessary to excise the lachrymal gland in order to cure the fistula.

Cauterize the mouth.