SURGICAL CORRECTION OF CERTAIN LACRIMAL PASSAGE ANOMALIES*†

A PRELIMINARY REPORT

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GROSS interference with the lacrimal passage may be of congenital, inflammatory or traumatic origin. The history and examination, particularly irrigation of the passages with radio-opaque fluid under a fluoroscope, will tell the surgeon what type of obstruction to expect. The type of lesion discussed here may vary from entire absence of lacrimal drainage passages to extensive obliteration of the canaliculus. The latter is frequently of traumatic origin. However, it is only in a very limited number of cases that a vein transplant will be required, since canaliculoplasty (Jones, 1960) and ease of mobilization of the lacrimal sac without graft, has proved very satisfactory.

Guy (1943) described a technique for lacodacryorhinorrhaphy. Stallard (1965) also mentioned various methods of producing tubal grafts for repair of the lacrimal passages.]

Method

An incision is made as for dacryocystorhinostomy, but should be positioned more laterally than the plastic purist will have it, even though the risk of keloid development is slightly increased. The lateral placement allows for an easier and more extensive approach to the inferior canaliculus. Careful dissection of the canaliculi, although briefly mentioned, is necessarily tedious. Detailed canalicular exposure is beautifully illustrated by Stallard (1965).

Once the lacrimal sac is delineated, it is necessary to determine its patency, as this was prevented by the inaccessibility of its aditus to radio-opaque fluid. Saline is injected into the unopened sac. If the sac is patent, then, once the more proximal obstruction has been by-passed, the tubegraft can be joined to the sac. This final investigation at operation will determine the length of graft required. It will also determine whether canaliculo-dacryocystorrhaphy or junction with the nasal mucosa will be required.

When a conjunctival-sac/nasal junction is planned and the area has been exposed accordingly, then sinus forceps are used to invaginate the medial fornix from the lacus area into the junction site. (In these cases, rhinostomy is usually needed.) The incised ends of the conjunctival opening are held by the assistant as the prepared polythene tube and vein are introduced (Fig. 1, opposite).

The length of vein is determined by measurement, and allowance must be made for the markedly contractile nature of the vessel. Because of limited exposure, the venous contractility would seem to exclude the use of the angular vein. Veins on the dorsum of the hand are the right size for the transplant required. The area is sterilized and the length of vein required isolated. The lumen is opened and localizing sutures are inserted before the vein is excised. The vein is gently coaxed over 1 mm. polythene tubing on a special stylet (Levy, 1960) and placed in a dish of saline (Fig. 2, opposite). 6-0 chromic gut sutures on atraumatic needles attach the proximal end of the vein to the conjunctival edges and after the other end of the tube is passed through the incised sac or nasal mucosa, the distal end of the vein is similarly sutured to the latter incision.

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FIG. 1.—Transplant is on polythene tubing after being attached to medial conjunctival fornix, before the tube is passed through the nasal wall into the nose.

FIG. 2.—Venous transplant on "Portex" tubing.

Where the canaliculus has to be replaced and the punctum can be used, then a "pigtail-probe"* (Fig. 3) is passed backwards *via* the opened end of the available canaliculus and out through the punctum. A length of "Portex 00 tubing"† has been threaded with 3-0 nylon blue-stained suture, the proximal end of which has been thickly knotted. The distal end of the suture is now wound around the small notch on the projecting end of the probe. This attachment is secured and withdrawal of the probe takes the suture, followed by the tube, through the punctum until an adequate portion projects from the cut end of the canaliculus (Kumings, 1965). The nylon suture is withdrawn and the end of the tube is introduced into the larger polythene tube, so that the vein, which was immersed in saline, can be slipped onto the smaller tube. 6-0 chromic sutures attach the vein to the canaliculus (Fig. 4).

FIG. 3.—"Pig-tail" probe.

FIG. 4.—Vein transplant sutured to proximal canalicular end. The suture is still attached to the proximal transplant region and crosses the forceps. Blood-stained tube is seen issuing from lighter coloured transplant.

The exposed end of the polythene tube is passed *via* the incised sac into the nasolacrimal duct. If the sac or duct is occluded, the tube will be passed through the ostium (Fig. 5, overleaf) made

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into the nose, and distal sutures anchor the transplant to the edges of the sac or nasal mucosal flaps. The polythene tube should be left *in situ* for 6 to 10 weeks.

It must be stressed that absolute haemostasis should be achieved by appropriate choice of anaesthetic, together with anti-Trendelenburg positioning of the patient and the use of electro-cautery.

FIG. 5.—Tube supporting transplanted vein has been passed through the medial conjunctival fornix, *via* rhinostomy (anterior mucosal flap just visible in wound depths), and out through the nostril.

FIG. 6.—Enlarged view of lacrimal cannula through superior punctum. Fluid is appearing medially at the site of the fistula.

Results

The following cases were all operated on more than one year ago.

Case 1, a child aged 12 years, had multiple congenital anomalies. No lacrimal drainage system had developed on either side and bilateral laco-rhinorrhaphy, using the above described technique, was successfully performed.

Case 2, a woman aged 54, had bilateral canalicular obliteration of inflammatory origin. The obstructions were cured by canaliculo-dacryocystorrhaphy, as described. Here, rather distressing oozing of blood plagued one throughout most of the operation, but did not vitiate a satisfactory result.

Case 3, a woman aged 65, had had excessive irradiation of the left lacrimal sac region a year previously for local malignancy. This therapy obliterated the entire lacrimal drainage system on that side, as well as causing severe reaction in the surrounding tissues. Laco-rhinorrhaphy proved successful for a few months, but unfortunately the post-irradiation reaction was still progressive and seemed to be the cause of occlusion at the conjunctival ostium of the newly-fashioned passage. One's impression was that the whole passage was once again strangled by the reaction.

Two further cases had a considerable length of inferior canaliculus destroyed by trauma. One had an associated superior canicular fistula (Fig. 6), which was probably due to infection. In both the inferior punctum and a small portion of proximal canaliculus could be used and were joined by venous transplant to a patent lacrimal sac. The outcome was successful.

A more recent case of trauma had the same satisfactory surgical procedure, but the patient removed the polythene tube on the second postoperative day and the outcome at present is questionable.

Summary

A technique of plastic repair for lacrimal drainage dysfunction is described. This appears to be a logical improvement on well-documented methods. Venous transplantation was restricted to particular cases of lacrimal passage inadequacy. Although the time elapsed since operation is reasonable for assessment, the numbers are few and this therefore should be regarded as a preliminary report.

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