DACRYOCYSTORHINOSTOMY BY INTUBATION*

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THE value of draining an infected sac into the nose was recognized 1500 years ago by surgeons of the Byzantine School, who performed a crude dacryocystorhinostomy by passing a cautery through the sac and lacrimal bone. But such openings made by simple penetration rapidly close, and much surgical ingenuity has since been devoted to the problem of fashioning a permanent communication. At the beginning of the 20th century, Toti (1904) laid the foundation of the modern operations of external dacryocystorhinostomy. Since then the careful work of many surgeons has resulted in procedures which give a high percentage of success—Traquair (1940), 80 per cent.; Scott (1949), dacryocystitis 99.4 per cent., epiphora 76.9 per cent.; Stallard (1950), 89 per cent.; Rycroft (1951), over 80 per cent. Despite these excellent results, dacryocystectomy is still being very generally performed because it is believed that dacryocystorhinostomy is successful only in exceptionally experienced hands, is time-consuming, is often beset with technical difficulties, and sometimes involves painful post-operative treatment.

RATIONALE OF INTUBATION

Complicated techniques of dacryocystorhinostomy have been elaborated to circumvent nature's efforts to close the artificial opening, but this result can be more simply and effectively achieved by inserting a small polythene tube which passes from the sac through the lacrimal bone into the middle meatus. With such a tube in position, permanent drainage from the sac to the nose is assured, and, as the x ray shows, lipiodol passes into the nose within a few minutes of its injection into the sac (see Figure, opposite).

The use of this tube materially simplifies dacryocystorhinostomy. An opening of only 6 mm. in diameter is required in the fragile lacrimal bone, and the suturing of the mucosa is made unnecessary as the tube holds this in place during healing.

No objections have been found to the permanent retention of such a tube, polythene is in general use for many purposes and has been found to be innocuous. The author has used indwelling tubes for the repair of different parts of the lacrimal drainage system since 1944 with no evidence of any tissue intolerance and an interim report on various uses was presented in 1947 (Summerskill, 1948). In that communication two methods of dealing with dacryocystitis due to an obstructed naso-lacrimal duct were described:

- (a) insertion of a tube into the naso-lacrimal duct,
- (b) by-passing the duct by the method under review.

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FIGURE.—Right sac intubated about 1 year before x ray, and left sac a few weeks before. Cannulae have been introduced to indicate openings of tubes.

An extensive trial of intubation of the duct produced only about 60 per cent. of successes, because fibrosed ducts, even after probing, will not accept a tube of adequate calibre and moreover progressive cicatrization often forces the tube gradually upwards into the sac. Better results by the second method were later reported (Summerskill, 1949) in a series of 28 cases; it was then suggested that

further observation on more cases will be required to confirm that these results are permanent, but . . . this little operation will I believe provide the answer to the problems of severe idiopathic dacryocystitis.

Later experience has confirmed this opinion. Judged by the disappearance of symptoms and the unobstructed passage of fluid into the nose from a syringe inserted into the sac, this operation has been successful in 96 per cent. of suitable cases. The failures are due to the difficulties occasionally encountered in satisfactorily closing the excessively shrunken type of fibrosed sac. In view of the simplicity and reliability of this procedure, it should rarely be necessary to deprive patients with dacryocystitis of the comfort of a functioning lacrimal drainage system by dacryocystectomy.

SELECTION OF CASES

This operation is indicated for dacryocystitis due to any form of simple obstruction of the naso-lacrimal duct which cannot be resolved by more conservative measures.

Idiopathic dacryocystitis is the commonest form (76 per cent.). It shows a definite hereditary tendency and a higher incidence among women, and is appar-

ently caused by developmental faults in the bony canal (Summerskill, 1948). With this class of case conservative measures generally fail, and it is eminently suitable for treatment by dacryocystorhinostomy.

Infantile dacryocystitis (about 22 per cent.) follows congenital obstructions of the membranous duct and can usually be cured by conservative methods, if not too long delayed. Some infantile cases (2 per cent.) are early examples of the idiopathic disease. These will relapse after conservative treatment and later require dacryocystorhinostomy.

In the third group, representing some 2 per cent. of the total, the obstruction is due to acquired disease—to new growths in the sac, antrum, nose, or surrounding tissues, to specific infections, or to trauma. If the sac is not too badly damaged, some of the traumatic cases are suitable for dacryocystorhinostomy. The symptomatic epiphora of the other forms is of little importance compared to the gravity of the primary disease, and care must be taken not to confuse them with the simple idiopathic dacryocystitis.

As this operation imposes no more strain on the patient than a dacryocystectomy, it is, subject to reasonable health, suitable for patients of all ages after early childhood. The author's series contains cases ranging from 4 to 72 years of age.

Operation is not undertaken until conservative treatment has failed. This consists of a series of irrigations of the sac under pressure, the cannula of the lacrimal syringe being passed into the duct, if necessary, to secure a patent passage to the nose. It may be supplemented by appropriate systemic treatment depending on the organisms found to be present. Probes should not be used; they do not cure the obstruction and they subject the patient to unnecessary pain.

The operation is carried out in the presence of a fistula or of a sub-acute exacerbation of the infection, but it is generally convenient to postpone it in the presence of an acute dacryocystitis until the oedema has subsided under treatment.

Any lacrimal obstruction above the sac—in the lid, the lower canaliculus, or the sinus of Maier—, or nasal conditions which would prevent the introduction of the polythene tube—such as a gross deflected septum or a polyp—, need to be rectified before operation.

OPERATION

Instruments.—The special requirements for this operation are the polythene tubes, an introducer, and three probes of suitable size*. The tubes are 5 mm. in diameter and 10 mm. in length, bevelled at one end and with triangular flanges at the other to hold them in the sac. The introducer is a rod, 4 mm. in diameter with a shoulder 12 mm. from the end. Three double-ended bulbous probes, the largest 6 mm. in diameter, are used to perforate the lacrimal bone and to enlarge the stoma sufficiently for a tube to fit.

Anaesthesia.—Premedication consists of omnopon g. 1/3 and scopalamine g. 1/150 (for an average adult) unless it is necessary for the patient to go home on the same day, when nembutal g. 3 and atropine g. 1/100 are used. Anaesthesia is induced by thiopentone and followed by nitrous oxide, oxygen, and minimal ether. In robust patients a relaxant is used, then a non-cuffed orotracheal tube, as large as possible, is passed. The pharynx is packed with gauze squeezed out in normal

* Instruments to these designs are supplied as a set with a lacrimal syringe, a Meyer's straight silver cannula, and a perforated metal box for containing the tube during sterilization, by Messrs. Down Bros., Meyer, and Phelps Ltd., 92, Borough High Street, London, S.E.1.

saline, and anaesthesia is continued on an open circuit. At the end of the operation, after removal of the packing, the pharynx is inspected with a laryngoscope and blood clot if present cleared out with the sucker (Dr. P. Merlin).

Technique.—The incision runs from the medial palpebral ligament 3 mm. internal to the medial canthus and curves downwards and slightly outwards along the anterior lacrimal crest to the level of the upper opening of the bony canal. The skin edges are undermined and the orbicularis split; the ligament is exposed but left intact. A speculum is inserted and the lacrimal fascia is exposed by blunt dissection. An incision of 8 mm. is made through the fascia into the sac in its long axis terminating below just above the commencement of the duct, and a catgut suture is inserted into each edge of the wound to act as traction sutures. When there has previously been some peridacryocystitis, it is often convenient to insert the suture before making the incision and to pass a probe through the canaliculus to act as a guide to the sac cavity. Gentle traction on the sutures is maintained, and the smallest of the three probes is passed into the sac and down into the commencement of the naso-lacrimal duct. This is done because the duct is used as a guide to the lowest part of the lacrimal bone. The anterior part of the lacrimal fossa is formed by the hard frontal process of the maxilla, the lacrimal bone lying behind it with its descending process forming the posterior part of the bony canal. Therefore, to perforate the lacrimal bone at its lowest part, the probe is withdrawn slowly from the duct, and as its point leaves the upper end it is passed medially and slightly backwards and downwards. Little pressure is required to perforate the bone, and the probe is passed on until it touches the nasal septum. The opening is enlarged by passing the medium-sized and then the largest (6 mm.) probe. The field is kept clear of blood by a sucker and oozing is reduced considerably if each probe is left in position for a minute before withdrawal. The polythene tube is then inserted on the applicator and care is taken to see that it is firmly in position with the flanges in the long axis of the sac. Penicillin-sulphathiazol powder is insufflated into the sac cavity and wound. The tube is washed through with the lacrimal syringe to free it from blood and debris, and the sac is closed by tying the traction sutures. The skin is closed by three or four interrupted silk sutures and a dry dressing held by strapping is applied.

Post-Operative Supervision.—Little post-operative treatment is required, for efficient drainage is assured by the tube. Young patients may leave hospital directly they have fully recovered from the anaesthetic; elderly patients are kept in over-night. Healing usually occurs by first intention and the skin sutures are removed after 7 days. The dacryocystitis rapidly subsides, systemic penicillin or other suitable antibiotic for a few days is indicated if operation has been undertaken in the presence of a sub-acute attack. A fortnight after operation the sac is gently irrigated with sol. sulphacetamide 30 per cent. to demonstrate that drainage is satisfactory and to wash through any debris and blood clot. Earlier irrigation should be avoided but may be required if the tube is not left clear at the time of operation. Normally the fluid passes easily into the nose and no further treatment is required.

It is occasionally difficult to secure an efficient apposition of the sac wall when it has been damaged by repeated attacks of peridacryocystitis, and the tube may later protrude. The tube in such cases is easily removed through an incision over it and

if the stoma is established it will often continue to function leaving satisfactory drainage. Otherwise no late complications have been encountered.

SUMMARY

Dacryocystorhinostomy, not dacryocystectomy, is the treatment of choice for dacryocystitis due to simple naso-lacrimal duct obstructions resistant to more conservative procedures. The operation has not been generally adopted because it is believed that special experience is required to fashion an opening between the sac and the nose which will not later close. The use of a polythene tube, which is passed from the sac through the lacrimal bone to the middle meatus, gives reasonable assurance of permanent drainage and materially simplifies dacryocystorhinostomy technique. The operation is described.

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