CORRESPONDENCE

Late dacryocystorhinostomy failure from lacrimal sump syndrome with pseudo-sac formation

Dacryocystorhinostomy (DCR) is the gold standard in treating nasolacrimal duct obstruction (NLDO) by creating a conduit between the lacrimal sac and the nasal cavity. DCR can be performed through a cutaneous incision, commonly referred to as external DCR, or via a transnasal approach under either direct visualization or endoscopic guidance. In both approaches, the lacrimal sac mucosa is connected to the nasal mucosa above the level of the obstruction at the nasolacrimal duct.[1] The DCR failure rate ranges from 5% to 10%, with lacrimal sump syndrome (LSS) as a known cause.

Welham and Wulc[2] first reported cases of LSS in 1987 when they described the radiological appearance of sac remnants in cases of failed DCR. Dacryocystograms of these patients were found to be "partially patent" with a dilated sac and overflow of dye into the nose. Later, in 1993, Jordan and McDonald reported occurrences of LSS in endoscopic or external DCR patients ranging from 0.3% to 4.8%.[3,4] The distinctive feature of LSS is the residual lacrimal sac formed after DCR with normal lacrimal irrigation and dye disappearance tests. LSS classically occurs due to inadequate marsupialization of the lacrimal sac inferiorly or because the ostium is situated too high[5] or is too small.[2,3] In many patients with LSS, probing and syringing of the lacrimal drainage system may appear normal[6]; hence, a high index of suspicion is required among patients with LSS after DCR.[7]

Here, we report a case of late dacryocystorhinostomy failure from lacrimal sump syndrome with cicatricial pseudo-sac formation. To the best of our knowledge, this is the first report on LSS secondary to a cicatricial pseudo-sac due to severe postoperative scarring.

A 53-year-old Chinese female first presented to the ear, nose, and throat (ENT) department at a tertiary eye centre in Singapore in 2000 with symptoms associated with chronic sinusitis, which included nasal discharge, postnasal drainage, congestion, and sinus discomfort. She subsequently underwent functional endoscopic sinus surgery (FESS).

Two years post-FESS (2002), she developed left NLDO and underwent left endoscopic DCR. Postoperatively, she remained asymptomatic, achieving anatomical and functional patency without the use of postoperative intranasal steroids. However, 13 years post-FESS (2013) the left DCR failed and a revision DCR with stenting was performed. The stent was removed 16 months postrevision DCR without endoscopic evidence of granulation or scarring noted at the ostium. Unfortunately, the left revision DCR failed again in 2015, with the patient presenting with epiphoria and mucoid discharge from the left inferior punctum. Clinical examination revealed a high tear lake with no apparent mucocele in the left eye. Endoscopic evaluation by ENT revealed a scar band across the lower aspect of left DCR opening, resulting in the formation of a small sump/pseudo-sac resulting in LSS (Fig. 1). The patient was subsequently counselled and consented to left endoscopic dacryocystorhinostomy and bicanalicular silicone intubation and mitomycin C under general anaesthesia.

Intraoperatively, left nasal endoscopy showed cicatricial narrowing around a patent common canalicular opening and a transverse fibrotic shelf inferiorly. The latter formed a pseudo-sac, causing tears retention and stasis (Fig. 2a and b). A 3-0 Bowman's probe was kept at the common canalicular (CC) opening to protect healthy mucosa while removing scar tissue, while hemostasis was secured with co-phenylcaine nasal packing.

The pseudo-sac was marsupialized endoscopically using a sickle knife to remove the fibrotic shelf and pericanalicular cicatrix (Fig. 3). Blakesley upcutting forceps was subsequently used to clear the scar tissue, leaving behind a rim of healthy mucosa around the CC opening.

Intraoperative mitomycin C (0.4 mg/mL × 5 minutes) was then applied over the DCR opening and washed off with normal saline. This was followed by placement of a bicanalicular Crawford stent, which was secured by a Liga clip (Fig. 4). Syringing with a Bowman probe was then performed to confirm patency, and the proximal end of the tube was visualized endoscopically to ensure correct placement.

The immediate postoperative recovery was uneventful, and the patient was discharged home with Dacle eye drops (chloramphenicol 0.5%; dexamethasone sodium phosphate 0.1%; tetrahydrozoline hydrochloride 0.025%) 3H to the left eye for 1 month.

Her postoperative consultation at 1 week was uneventful. Endoscopic evaluation by ENT surgeons 2 weeks postprocedure revealed satisfactory stent position with

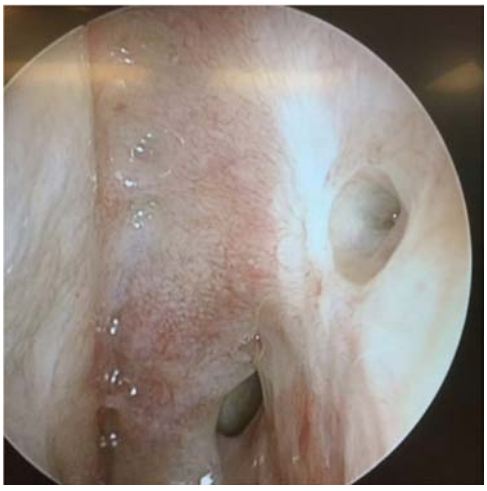

Fig. 1—Scar band across dacryocystorhinostomy opening forming a pseudo-sac and lacrimal sump syndrome.

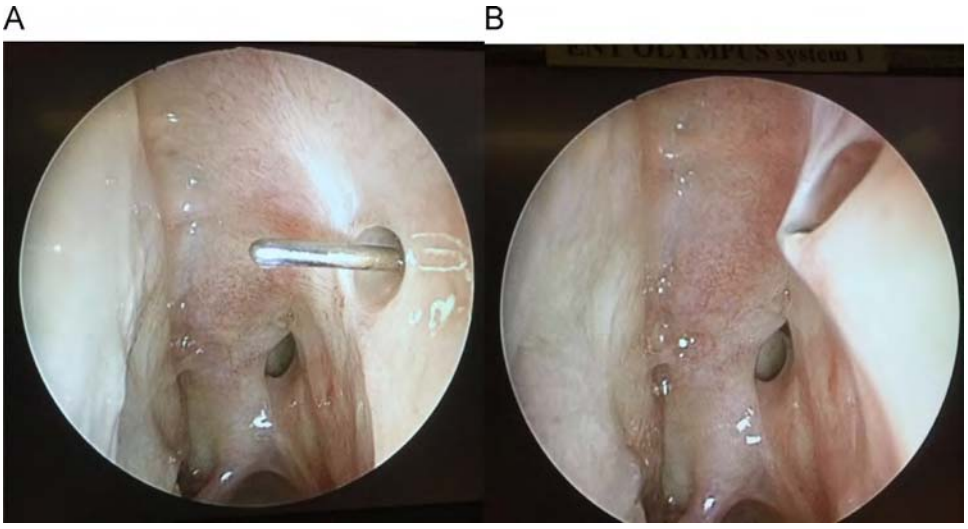

Fig. 2—Intraoperative images of scar band. A, shows the bowman probe at the CC opening with scarring seen at the CC opening. B, Tenting of the band intraoperatively.

good tear flow. The lacrimal stent was eventually removed at postoperative month 2 with no significant scarring or recurrence of the sump at the CC opening. The patient has remained symptom free 1 year postprocedure with a negative dye disappearance test and patent ostium (Fig. 5a and b).

LSS is classically defined in the context of an external DCR when a residual sac forms[6] from inadequate marsupialization of the lacrimal sac inferiorly or when the ostium is situated too high[5] or is too small.[2,3] This leads to tear collection, symptomatic epiphoria, and recurrent dacryocystitis even in the presence of normal syringing and probing and dye disappearance tests. Dacryocystography may demonstrate characteristic retention of contrast material in the residual sac as well as overflow of contrast into the nasal cavity.

In 1987, Welham and Wulc[2] reviewed 208 cases of failed DCRs at the Moorefield's Eye Hospital from 1970–1985 and concluded that 52% of DCR failures were attributed to improper positioning of the ostium. An ostium created too low will not able to bypass an obstruction superior to it, whereas an ostium that is too high creates a blind pouch from which tears cannot drain, which thus retains tears and is a nidus for infection. The ideal ostium should remove all bone between the medial wall of the sac and the nose, leaving approximately 5 mm around the canaliculus free of bone. Fayet et al.[3] also reported that in addition to insufficient downward extension of the bony ostium, a small osteotomy may be related to lacrimal sump syndrome.

Additionally, Migliori illustrated that LSS can also occur when a residual sac forms either by nasal mucosa

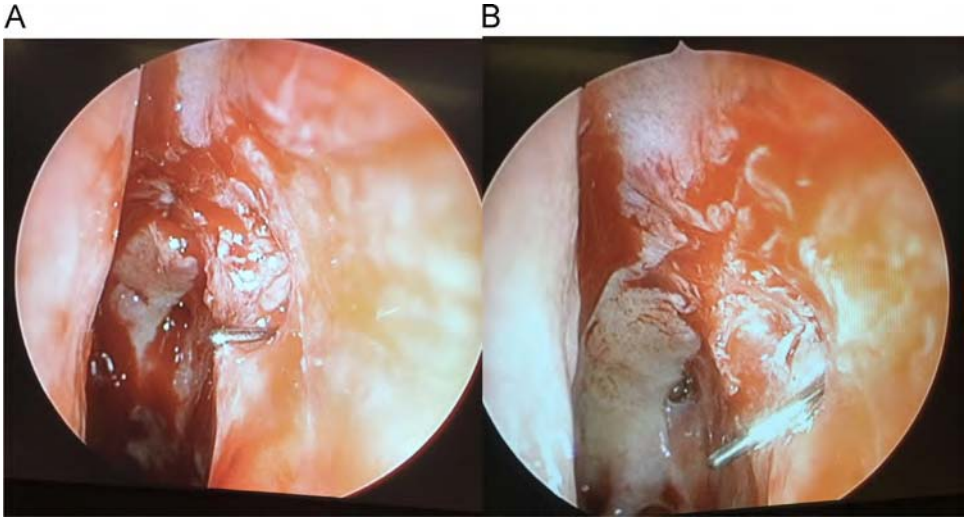

Fig. 3—Intraoperative photographs postendoscopic marsupialization of the pseudo-sac. A and B, are intra-operative photos of the scar band at the CC opening post-marsupialization.