Assisted locoregional anaesthesia for endoscopic endonasal dacryocystorhinostomy with concomitant septoplasty

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The standard treatment for nasolacrimal duct obstruction has been dacryocystorhinostomy (DCR) surgery. Endoscopic endonasal dacryocystorhinostomy (EnDCR) has been gaining popularity, largely because of technological advances in endoscopes and other modern instruments used for rhinologic surgery. EnDCR can be performed under locoregional anaesthesia in elderly and medically unfit patients for general anaesthesia. The EnDCR often requires septal or turbinate surgery to optimize access to the lacrimal area. Here, we report a revision EnDCR using cold steel tools with powered drills under locoregional anaesthesia in an unfit elderly patient with chronic excessive tearing because of chronic dacryocystitis.

Keywords:
concomitant septoplasty, endoscopic endonasal dacryocystorhinostomy, locoregional anaesthesia

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Introduction

Epiphora remains one of the most bothersome presentations of lacrimal system obstruction, with significant social impact. The standard treatment for nasolacrimal duct obstruction has been dacryocystorhinostomy (DCR) surgery. Endoscopic endonasal dacryocystorhinostomy (EnDCR) has been gaining popularity, largely because of technological advances in endoscopes and other modern instruments used for rhinologic surgery. EnDCR can be performed under locoregional anaesthesia in elderly and medically unfit patients for general anaesthesia. EnDCR is a viable alternative to external DCR; coexisting sinonasal diseases can be managed simultaneously, as may be required in 25% of cases [1]. The EnDCR often requires septal or turbinate surgery to optimize access to the lacrimal area. The incidence of concomitant procedures in a study showed that 35% of patients needed septoplasty and 19% underwent additional endoscopic sinus surgery [2]. Here, we report a revision EnDCR using cold steel tools with powered drills under locoregional anaesthesia in an unfit elderly patient with chronic excessive tearing because of chronic dacryocystitis.

Case report

A 63-year-old man with hypertension and diabetes mellitus presented with a chronic history of right epiphora and blurring of vision. Initially, he was assessed by an ophthalmologist and a diagnosis of right nasolacrimal duct obstruction secondary to chronic dacryocystitis was made. Digital subtraction dacryocystography confirmed and showed the site of right nasolacrimal duct obstruction (Fig. 1). Subsequently, the patient underwent right external DCR under general anaesthesia; however, the symptoms recurred. Contrast-enhanced computed tomography scan showed a rim-enhancing right lacrimal sac with thick fluid within (Fig. 2). In addition to his previous comorbidities, the patient developed severe obstructive sleep apnoea with severe cervical osteophytic changes with indentation into the spinal canal that placed the patient at a high risk for a general anaesthetic. Revision right EnDCR under locoregional anaesthesia was performed with monitoring of the pulse, pulse oximetry and blood pressure through-

Figure 1

The digital subtraction dacryocystography shows contrast delineating both the inferior and the superior canaliculi and into the lacrimal sac. No further contrast flow delineating the right nasolacrimal duct indicating the site of obstruction (white arrow).

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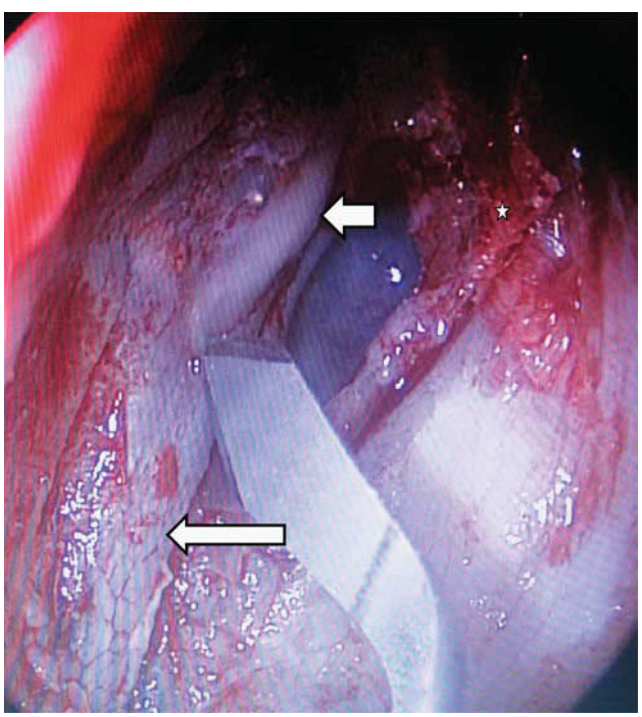
Figure 2

Axial slice of contrast-enhanced computed tomography of the orbit at the level of the lacrimal sac showing rim enhancement with thick fluid within the right lacrimal sac (white arrow).

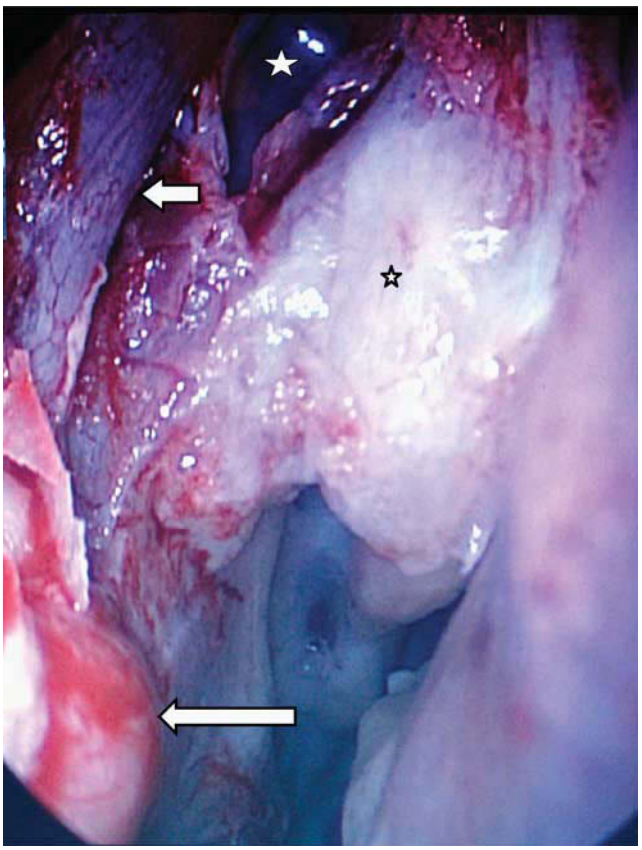
Figure 3



Intraoperative endonasal endoscopic view showing the fundus of the lacrimal sac with obvious indentation of the probe through the lacrimal sac and pus discharge (large arrow) and the nasolacrimal duct (small arrow) after drilling out the nasal process of the maxilla. Asterisk points to folding back of the nasal mucosal flap.

out the procedure. A topical conjunctival anaesthesia was administered using 1% amethocaine eye drops to the right eye. Local lacrimal fossa block was performed by an injection of 2 ml of 2% lignocaine with 1 : 100 000 adrenaline midway between the nasal bridge and the medial canthus. Individual block of infratrochlear, infra-

Figure 4



Endoscopic view of the right-side nasal cavity. The large arrow points to the right inferior turbinate. Opened agger nasi cell (large asterisk). The reflected nasal mucosal flap performed initially (small asterisk). Nasolacrimal duct after lacrimal bone removal (small arrow).

orbital and external nasal nerve was performed. Intranasal anaesthesia was initiated by the application of a nasal pack soaked in a decongestant solution of 4% cocaine. Subsequently, 3 ml of 1% ropivacaine with 1 : 100 000 adrenalines were injected into the anterior root of the middle turbinate, mucosa surrounding the lacrimal sac region and deviated nasal septum under endoscopic visualization. After 15 min of completed injections, initially, septoplasty was performed to ensure access to the lacrimal sac. The mucosal flap was elevated, exposing the junction of the hard frontal process of the maxilla and the thin soft lacrimal bone. Drilling by the diamond burr (2.9 mm with a 15° curvature) over the thick superior part of the frontal process of the maxilla was performed to expose the sac fully (Fig. 3). Once the fundus of the sac was adequately exposed, the common canalicular opening was identified and a stenting silastic tube was inserted into the nasal cavity. The nasal mucosal flap was reflected back onto the lateral nasal wall to fit around the opened lacrimal sac so that the mucosal edges were closely apposed (Fig. 4). Haemostasis was achieved with no secondary haemorrhage by adequate anaesthetic vasoconstriction. The duration of surgical time spent in the operating room was 2 h. Postoperatively, the surgery was uneventful and no nasal packing was inserted. The patient was initially followed up weekly and at the third

month follow-up visit, the stenting silastic tube was removed by cutting the exposed part at the medial canthus. Subsequently, a regular follow-up visit every 4 months was scheduled for progress and symptom surveillance.

Discussion

EnDCR is a minimally invasive procedure that involves marsupialization of the inferior three quarters of the lacrimal sac and superior nasolacrimal duct into the nose. For revision DCR, the entire medial wall of the lacrimal sac is removed. Preoperative endonasal endoscopy is essential to assess the accessibility to the site of operation. The difficulty in accessing the lacrimal sac because of a deviated nasal septum necessitates previous septoplasty as complete exposure and marsupialization of the lacrimal sac with adequate bone removal is vital in successful EnDCR. Computed tomography scan allows visualization of the anatomy of the bone frame and consequently to detect the position of the uncinate process and the relationship with lacrimal bone and lacrimal sac, the presence of a Haller cell and pneumatization of agger nasi and also to rule out nasolacrimal duct apparatus encroachment in paranasal sinus tumour and nasolacrimal ducts mucocele causing obstruction. Locoregional anaesthesia is a good alternative when general anaesthesia poses a constant threat to the patient's life particularly in the elderly. Moreover, it reduces the length of hospital stay and healthcare cost. As lacrimal blockage is found commonly in the elderly, regional rather than general anaesthesia may be more reliable. Effective locoregional anaesthesia for this procedure requires neural blockade of two adjacent operative fields. These are the anteromedial orbital structure including the lacrimal fossa and the nasal mucosa and periosteum anterior to the uncinate process, which is innervated by the infratrochlear and infraorbital nerve and the lateral wall of the nasal cavity. The latter is innervated by the external nasal nerve and the lateral internal nasal nerve. The main problems of EnDCR are doubts in terms of long-term patency and osteotomy closure by granulation tissue. The success rate depends on the creation of a wide intranasal stoma with removal of adequate bone. The bone opening should be as large as the mucosal opening, which will enable complete visualization of the lacrimal sac. The small osteotomy size has been considered by some studies as a common cause of DCR failure [3]. The success rate depends on the creation of a wide intranasal stoma with removal of adequate bone. A study has shown that there is a small reduction in the size of the lacrimal ostium in the first 4 weeks that corresponds to the initial stages of healing. However, after 4 weeks, there was no significant change in ostium size [4]. The nasal mucosa must be trimmed so that no bare bone is left. This step is particularly important because it reduces the formation of granulomas. Care must be exercised to ensure that the nasal mucosal flap does not cover the opening created in the lacrimal sac. Under uneventful circumstances, the patient is discharged the same day without any complications.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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