Endoscopic Dacryocystorhinostomy

M I Rasan, MS(ORL-HNS)*, S Shailendra, MS(ORL-HNS), N Prepageran, FRCS,** K Gopala, FRCS**, K S Sathananthar, FRCS***

Department of Otolaryngology, *Hospital Sultan Haji Ahmad Shah, Jalan Maran 28000 Temerloh, Pahang, **University Malaya Medical Centre, 50603 Kuala Lumpur

SUMMARY

A review of 45 patients who underwent endoscopic dacryocystorhinostomy (EDCR) from 1998 to 2005 was done. Only patients who had complete notes and had Jones tube removed at least three months before the study were included. Our experience with EDCR concludes it to be an easy, efficient treatment for nasolacrimal duct obstruction with minimal complications.

KEY WORDS:
Endoscopy, Dacrocystorhinostomy, Epiphora

INTRODUCTION

Dacryocystorhinostomy is a surgical procedure where an alternative pathway is created to drain an obstructed lacrimal system into the nasal cavity. This can be accomplished externally or via endonasal endoscopic approach. Historically, the surgical approach to the nasolacrimal apparatus has been via external approach due to poor intranasal visualisation. The nasolacrimal system is intimately related to the lateral nasal wall and with the advent of small calibre nasal endoscopes; it can be easily approached with minimal functional and physiological interference[1].

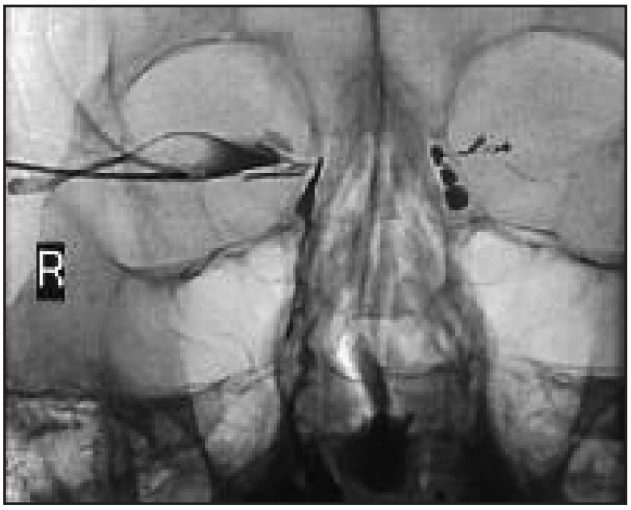

Fig. 1: Dacryocystogram showing a left nasolacrimal duct blockage

MATERIALS AND METHODS

A review of all patients who underwent EDCR from 1998 to 2005 was done. Only patients who had complete notes and had Jones tube removed at least three months before the study were included. Personal particulars, indication, investigations e.g. dacrocystogram, previous surgery, functional outcome and complications were noted.

Surgical procedure:

The nasal cavity is initially packed with ribbon gauze soaked in cocaine 10% (2ml in 10ml saline). The EDCR is performed with a light probe inserted into upper and lower orbital canaliculi after dilating it with a probe. This is carried out by the Ophthalmologist initially and then by the Otolaryngologist. Endoscopic examination is done with a rigid Hopkin rod nasal endoscope with the video camera system. The area adjacent to the lacrimal sac, usually anterior to the insertion of the middle turbinate is identified. The light probe illuminates the lacrimal sac and thus becomes a useful guide in locating the sac.

Mucosa around the area is elevated and Aggar Nasi cells or part of the uncinate process is removed if required. The bony wall is drilled if required until the lacrimal sac is exposed. The sac is then opened. The light probe is withdrawn and Jones tube is inserted via upper and lower canaliculi into the sac which is delivered into the nasal cavity and knotted to hold it in place. The tube is kept in situ for at least three months before it is removed. This thus forms a fistula between lacrimal sac and nasal cavity and aids drainage of tears via capillary action.

RESULTS

A total of 45 patients were included in the study. Their age ranged from 4 to 77 years old. They consist of 18 females and 27 males. All had persistant epiphora. Forty-three patients had unilateral epiphora; 18 on the right and 25 on the left. Two patients had bilateral obstruction. Nineteen of them had recurrent dacrocystitis, characterised by purulent discharge. Two had lacrimal sac abscess that had to be drained. One patient had recurrent admission for intravenous antibiotics. One patient had mucocele of the lacrimal sac.

Dacrocystogram (DCG) was performed in 25 patients and all had evidence of blocked nasolacrimal duct (Figure 1). In 20 patients, DCG was not performed as all had distal obstruction. Twenty five patients had prior syringing of the

This article was accepted: 04 March 2008
Corresponding Author: M I Rasan, Department of Otolaryngology, Hospital Sultan Haji Ahmad Shah, Jalan Maran 28000 Temerloh, Pahang

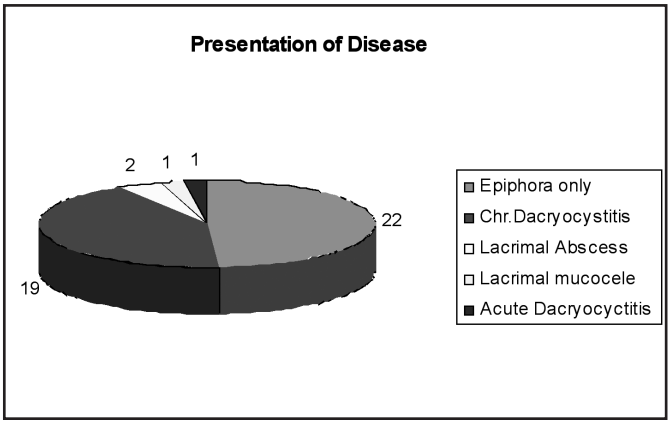

Fig. 1

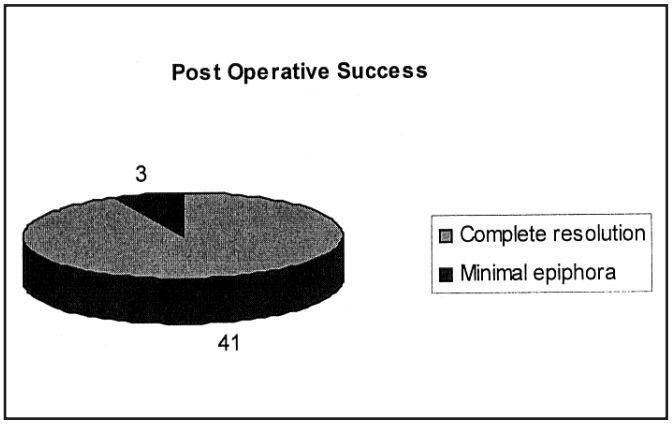

Fig. 2

canaliculi. Five patients had trauma prior to the onset of their symptom. One of them was punched in her face while four were involved in a motor vehicle accidents, sustaining maxillary fracture that needed open reduction. One patient developed epiphora after lateral rhinotomy and medial maxillectomy for nasal angiofibroma.

Forty four patients underwent the procedure successfully (46 cases); in one patient the procedure had to be abandoned as his orbital canaliculi could not be canulated. This patient had depressed frontal process of maxilla after open reduction of his maxilla.Fourty two (95.4%) patients (44 cases) had complete resolution; they were completely symptom free for three years after the procedure. Two patients (5%) still had occasional tearing but their symptoms were markedly reduced after the procedure. They were happy with the functional results. Complications of this procedure were minimal; Four patients developed a synachae between the septum and middle turbinate and one patient's Jones tube was impacted, requiring general anaesthesia for removal. Another child had premature dislodgement of tube after four weeks. She was one of the patients who still had occasional minimal tearing.

DISCUSSION

External dacrocystorhinostomy was first described by Toti in 1904[2]. Since then, the majority of DCR has been via an external approach. Caldwell described the first endonasal operative approach to the lacrimal system in 1893[3]. Intranasal approach to the lacrimal apparatus, avoiding an external scar, was limited by poor visibility within the narrow confines of superior meatus[4].

Surgical access throughout the nasal cavity has been enhanced by endoscopic nasal surgery. Small diameter endoscopes with angled vision provide excellent intranasal visualization, enabling the surgeon to identify and open the lacrimal sac with relative ease. It provides direct vision of the lacrimal sac, making the procedure safe even in the presence of fibrosis from previous surgery[3]. This is usually performed under general anaesthesia. On average, the procedure takes around forty minutes to an hour, depending on anatomical configuration of the nasal cavity.

Any existing nasal pathology that contributes to DCR failure, such as postoperative adhesions, enlarged middle turbinate and deviated nasal septum can be readily identified and corrected via endoscope. These advantages give endonasal endoscopic surgery a distinct edge over the conventional open surgery. As for the comparison of cost, endonasal procedures are more costly as these require endoscopes and endoscopic instruments. However, endoscopic nasal surgery is very commonly performed for a wide range of nasal pathologies and the same instruments can be used for most of these procedures.

The reported success rate for EDCR ranges from 75%-86%, which is similar to our results[4]. In experienced hands, external DCR can reach an efficacy of 90%[6]. It is likely that the success of this relatively new surgery will increase with experience. Laser assisted EDCR has been advocated in some centers.

Woog reported a long term osteal patency and success rate of 82% for 40 Laser assisted EDCRs, after a follow up of up to 91 weeks[7]. Metson described 46 laser assisted EDCR with a success rate of 82% after a follow up of 1 year[8]. Most surgical failures were due to gradual closure of the surgical ostea. Manor and Millman suggested that lacrimal sac anatomy is an important prognostic factor for successful EDCR. In a series of 18 patients, they found that patients with normal or dilated lacrimal sac had a success rate of 82% while those with scarred, fibrosed sac had a success rate of 29%[9].

Recently, Unlu HH *et al* described a 90.5% success rate in EDCR without use of silicone tube or stent. The rhinostomy opening was maintained during the post operative period with regular removal of nasal crust and use of eyedrops[10]. Revision EDCR with or without laser has been found to be a worthwhile endeavor for those who have failed a primary conventional DCR. Metson reported a 75% success rate with revision EDCR for failed primary external DCR[4]. Wormald PJ *et al* investigated the precise location of the sac with computer tomographic dacryocystograms (CT DCGs) to study the relationship of the lacrimal sac and the axilla of the middle turbinate[11]. He advocates that mucosal incisions 8 to 10 mm above and anterior to the axilla be made in order that the fundus of the lacrimal sac is exposed for marsupialization and reported 90% successful outcome[12].

The role of EDCR is not to replace the conventional DCR, but to enhance and provide an alternative approach for the treatment of lacrimal obstruction. For patients who want to avoid scar, endoscopic dacrocystorhinostomy provides an excellent alternative. Endoscopic DCR has the potential to reduce morbidity with improved hemostasis, utilization of local anaesthetics and shorter hospitalization.

REFERENCES

1. Whittet HB, Shun-Shin GA, Awdry P., Functional Endoscopic Transnasal Dacryocystorhinostomy. Eye 1993; 7 (Pt 4): 545-49.
2. A.Toti, Nuovo metodo conservatore dicura radicele delle sopperazioni croniche del sacco lacrimale(dacriocistorhinostomia), Clin. Modma. 1904; 10; 385-87.
3. G.W. Caldwell. Two new operations for obstruction of the nasal ducts with preservation of the canaliculi, Am. J. Ophthalmol. 1893; 10; 189-93.
4. Ralph Metson, Endoscopic surgery for lacrimal obstruction.Otolaryng Head and Neck Surg. 1991; 104: 473-79.
5. Par I, Pliskvova I, Plch J. Endoscopic endonasal dacryocystorhinostomy: indications, technique and results. Cesk Slov Oftalmol 1998; 54(6): 387-91.
6. McLachlan DL, Shannon Gm, Flanagan JC. Results of dacryocystorhinostomy: analysis of reoperations. Opthalmic surgery. 1980; 11: 427-30.
7. Woog JJ, Metson R, Puliafito CA, Holmium: YAG endonasal laser dacryocystorhinostomy. Am J Opthalmol.1993; 116: 1-10.
8. Metson R, Woog JJ, Puliafito CA. Endoscopic laser dacryocystorhinostomy. Laryngoscope. 1994; 104: 269-74.
9. Mannor GE, Millman AL. The prognostic value of preoperative dacryocystography in endoscopic intranasal dacryocystorhinostomy. Am J Opthalmol. 1992; 113: 134-37.
10. Unlu HH, Ozturk F, Mutlu C, Ilker SS, Tarhan S. Endoscopic dacryocystorhinostomy without stents. Auris Nasus Larynx. 2000; 27(1): 65-71.
11. Wornald PJ, Kew J, Van Hasselt CA. Intranasal anatomy of the naso-lacrimal sac in endoscopic dacryocystorhinostomy. Otolaryngol Head Neck Surg. 2000; 123: 307-10.
12. Wormald PJ.Powered endonasal dacryocystorhinostomy.Laryngoscope 2002; 112: 69-71.