

# Endonasal Endoscopic Dacryocystorhinostomy

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## Summary

A review of endoscopic dacryocystorhinostomy (EDCR) performed in University Hospital from 1998 till early 2001 were carried out. They were reviewed for indication, functional results, complications and other associated factors. Eleven patients (6 female and 5 male) were reviewed. All had unilateral nasolacrimal duct (NLD) obstruction (6 right, 5 left). Their ages range from 6 to 73 years. All 11 had persistent epiphora while 4 had concurrent recurrent dacryocystitis with purulent discharge. Two patients had history of lacrimal sac abscess that needed drainage. Ten patients had the procedure performed successfully. Functional results were excellent in 8 patients (80%) while two patients still had occasional epiphora although markedly reduced. Complications include synachae (1 patient), premature dislodgement of Jones tube (1 patient) and impacted tube in a child. Our experience with EDCR concludes it to be an easy, efficient treatment for nasolacrimal duct obstruction with minimal complications.

**Key Words:** Endoscopy, Dacryocystorhinostomy, 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 endoscope; it can be easily approached with minimal functional and physiological interference<sup>1</sup>.

## Materials and Methods

A review of all patients who underwent EDCR from 1998-early 2001 was performed. Only patients who had complete notes and had Jones tube removed at least 3 months before the study were included.

Personal particulars, indication, investigations e.g. dacryocystogram, previous surgery, functional outcome and complications were noted.

### *Surgical procedure:*

The nasal cavity was initially packed with ribbon gauze soaked in cocaine 10% (2ml in 10ml

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saline). The EDCR was performed with a light probe inserted into upper and lower orbital canaliculi after dilating it with a probe. This was carried out by an Ophthalmologist. Endoscopic examination was performed 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 uncinat process is removed if required. The bony wall is thick superiorly and thinner inferiorly. The bony wall was removed with Hajak Koffler or drilled if required until the entire lacrimal sac is exposed. The sac is then opened with a sickle knife.

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 6 weeks before it is removed. This thus forms a fistula between lacrimal sac and nasal cavity and aids drainage of tears via capillary action.

## Results

Eleven patients were included in the study. Their age ranged from 6 to 77 years old. They consist of 7 female and 4 males. All presented with unilateral epiphora; 6 on the right and 5 on the left. Five of them had recurrent dacryocystitis, characterised by purulent discharge. Two had lacrimal sac abscess that had to be drained. One patient had recurrent admission for IV antibiotics.

One patient had mucocele of the lacrimal sac (Table I).

Dacrocystogram (DCG) was performed in 5 patients and all had evidence of blocked nasolacrimal duct (Figure 1). In 6 patients, DCG was not performed. Ten patients had prior syringing of the canaliculi.

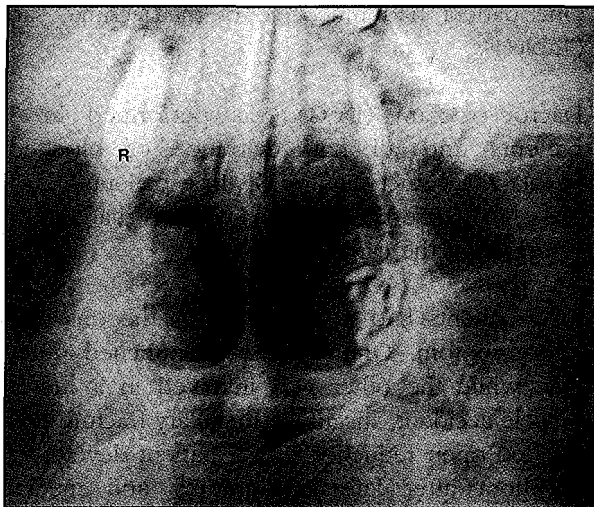
Two patients had trauma prior to the onset of their symptom. One of them was punched in her face while the other was involved in a motor vehicle accident, sustaining maxillary fracture that needed open reduction. One patient developed epiphora after lateral rhinotomy and medial maxillectomy for nasal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

Ten patients underwent the procedure successfully; in 1 patient the procedure had to be abandoned for neither the superior or inferior canaliculi could be cannulated. This patient had depressed frontal process of maxilla after open reduction of his maxilla. Eight out of 10 (80%) patients had complete resolution; they were completely symptom free after the stent removal till present; more than 6 months of follow up. Two patients (20%) still had occasional tearing but their symptoms were markedly reduced after the procedure and were satisfied with the functional results.

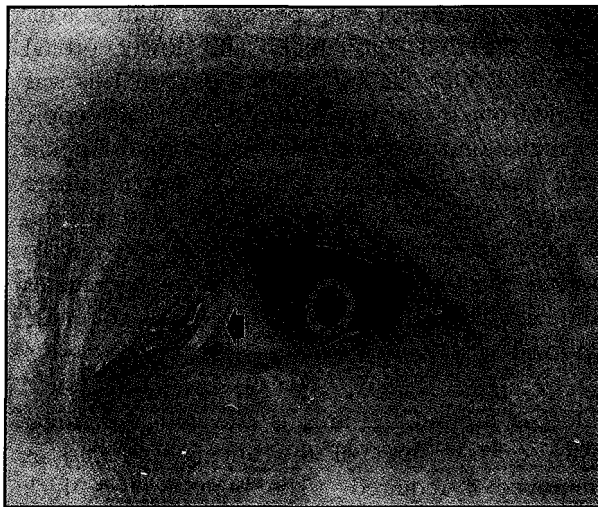
Complications of this procedure were minimal; One patient developed synachae between the septum and middle turbinate and her Jones tube was impacted, requiring general anaesthesia for removal. A child had premature dislodgement of tube after 4 weeks and she was one of the patients who still complained of occasional minimal tearing.

**Table I: Clinical presentation of patients**

Initial presentation	Epiphora	dacryocystitis	Mucocele	abscess
No. of patients	5	3	1	2



**Fig. 1: Dacryocystogram: blocked nasolacrimal duct with dilated lacrimal sac on the right (R ±)**



**Fig. 2: Silastic tubes in place in the medial canthus**

### Discussion

Dacryocystorhinostomy was first described by Toti in 1904. Since then, the majority of DCR has been performed via an external approach. Intranasal approach to the lacrimal apparatus, avoiding an external scar, was limited by poor visibility within the narrow confines of middle meatus<sup>2</sup>.

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<sup>2</sup>. 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<sup>3</sup>. In experienced hands, external DCR can reach an efficacy of 90%<sup>4</sup>. 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<sup>5</sup>. Metson described 46 laser assisted EDCR with a success rate of 82% after a follow up of 1 year<sup>6</sup>. Most surgical failures were due to gradual closure of the surgical ostea. This is usually due to incomplete exposure of the lacrimal sac. 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% <sup>7</sup>.

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 <sup>8</sup>. 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 <sup>2</sup>.

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 dacryocystorhinostomy provides an excellent alternative. Endoscopic DCR has the potential to reduce morbidity with improved hemostasis, utilization of local anaesthetics and shorter hospitalization.

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