



## ENDOSCOPIC DACRYOCYSTORHINOSTOMY: An Analysis of 16 Patients

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**Sixteen patients with obstruction in the nasolacrimal duct were treated by endoscopic dacryocystorhinostomy. The results were compared with that of external dacryocystorhinostomy. The role of endo-illuminator in locating the sac is discussed. Although the external and endoscopic approaches are both equally effective in relieving symptoms, endoscopic dacryocystorhinostomy has many advantages over the more conventional external approach.**

### INTRODUCTION

Obstruction of the nasolacrimal duct is a common problem that can be corrected with dacryocystorhinostomy (DCR). Although it is not a serious condition, the symptoms like epiphora or repeated infections are quite annoying and cosmetically distressing.

Traditionally, external dacryocystorhinostomy performed by ophthalmologists was the treatment used to drain the lacrimal sac in instances of nasolacrimal duct obstruction. The technique of external dacryocystorhinostomy was first described by Addeo Toti in 1904. Surprisingly, transnasal dacryocystorhinostomy was first described by Caldwell and West as early as 1893. However, this approach did not gain its present popularity mainly due to the difficulties in visualising the intranasal anatomy. With the development of rigid nasal endoscopes, the otolaryngologist now has a well-illuminated and magnified view of the nasal cavity. This has facilitated the intranasal surgical approach and has allowed more controlled access and manipulation of the lacrimal sac.

A cadaver study demonstrating the feasibility of endoscopic intranasal dacryocystorhinostomy was reported by Rice in 1988 [4] and the first clinical study was published by McDonogh and Meiring in 1989. [2] In 1996, Sprekelsen published a study on the reliability of the endoscopic approach. [5]

Although in experienced hands the success rate is equal in both methods, endoscopic dacryocystorhinostomy has many advantages over the more conventional external approach.

### MATERIAL AND METHODS

A prospective study was conducted between January 1996 and may 1999 in 16 patients. Patients with obstruction of the nasolacrimal duct were selected for the study. An endoscopic dacryocystorhinostomy was carried out as detailed below. Postoperatively all patients were regularly followed up for a period of 6 months. Patency of the stoma was checked by sac syringing and by inspection of the stoma endoscopically. Patients who were lost to follow up were excluded from the study.

### Surgical technique

Preoperatively a detailed clinical examination was carried out both by the ophthalmologist and the ENT surgeon. Radiological evaluation such as a dacryocystogram (DCG) and an X-ray of the paranasal sinus was done to find out the cause of obstruction of the nasolacrimal apparatus (Figs. 1 and 2). Any predisposing nasal conditions were treated either before hand or simultaneously at the time of endoscopic dacryocystorhinostomy. In our early cases as well as in children, uncooperative patients, revision cases and patients with acute dacryocystitis or with external fistula, general anaesthesia was used. The anaesthetists were requested to administer hypotensive anaesthesia to minimize bleeding. In all other cases local anaesthesia was preferred. The nasal cavity was packed with strip gauze soaked in 4% lignocaine with adrenaline (1:1,00,000), 10 minutes prior to the procedure. This gave adequate decongestion that allowed easy access, mucosal anaesthesia and a

bloodless field.

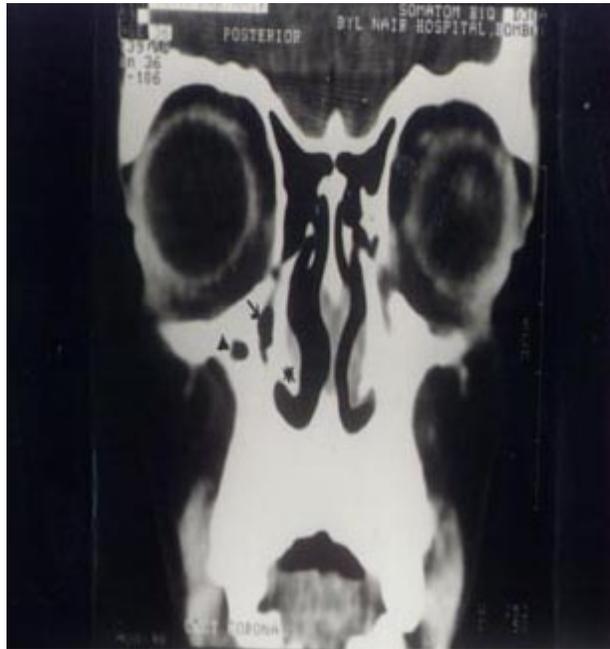


Fig 1. Coronal cut of CT scan of paranasal sinuses showing,\* the inferior turbinate, partially blocked nasolacrimal duct, Z anteriormost limit of the maxillary sinus.



Fig 2. DCG showing block in the nasolacrimal duct.

During the surgery, the patient was kept supine with head slightly turned towards the right. The patient's eyes were not covered by drapes. The area of lateral wall of the nose anterior and above the anterior attachment of middle turbinate was infiltrated with 2% lignocaine with 1:1,00,000 adrenaline as was the area of the lacrimal fossa externally, 0o and 30o endoscopes were used for surgery.

A 'U' shaped incision was made with a sickle knife in front of the anterior attachment of middle turbinate. A mucosal flap was raised with a Freer elevator and excised so as to expose the lacrimal bone (Fig. 3). Depending on the thickness of the lacrimal bone a defect was created either by drilling with a sheathed diamond burr or with a punch to expose the medial wall of the lacrimal sac. The bony defect was then widened and smoothed.

A vertical incision was then made on the sac and the entire medial wall was removed using upward biting forceps. Usually pus or mucus flows from the sac on incising it. If there was any doubt regarding correct identification of the sac then a lacrimal probe was inserted through the inferior canaliculus. This indented the medial wall of the sac. An incision was then made over it. In difficult cases, for correct identification of the sac, we used a special light probe, an endoilluminator that is used in vitrectomy surgery by ophthalmologists. After dilatation of punctum, the endoilluminator was passed through the canaliculus. The area of maximum brightness on the lateral wall of the nose was located which corresponded to the sac area. The patency of stoma was checked by syringing with methylene blue followed by a wash with antibiotic steroid solution (Fig. 4). Gel foam soaked in steroid solution was placed in the bony defect. This ensured haemostasis and prevented granulation tissue formation and fibrosis. One case required packing for 48 hours due to intra-operative bleeding. Mitomycin was applied to the bony defect and soft tissues in one case in order to prevent fibrosis.

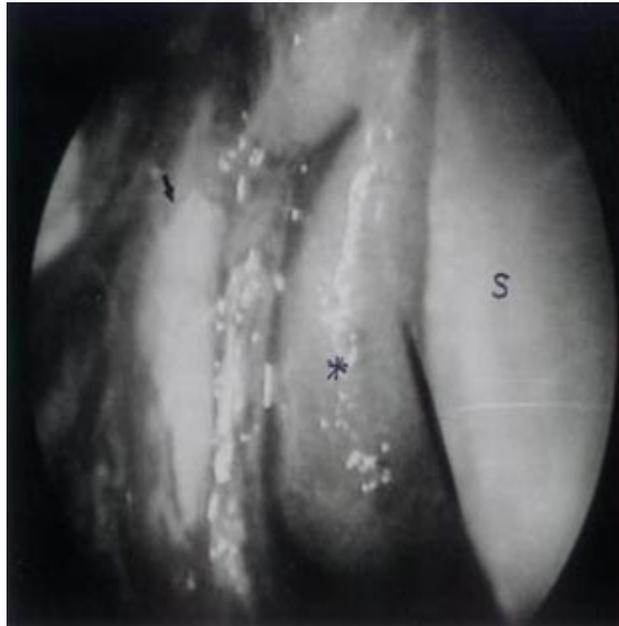


Fig 3. Endoscopic view showing exposed lacrimal bone; the middle turbinate, s the septum.

### Post-operative care and follow-up

During the immediate post-operative period, patients were asked to put antibiotic steroid eye drops to provide continuous flow through the lacrimal system. Nasal decongestant and steroid nasal drops were also given. Patients were instructed not to blow their nose during the first week after the surgery. Endoscopic visualization of nasal cavity was done one week after the surgery to check patency and to remove crusts and granulations, if any. Patients were followed up monthly for 3 months and at the end of six months to rule out the formation of adhesions and restenosis.

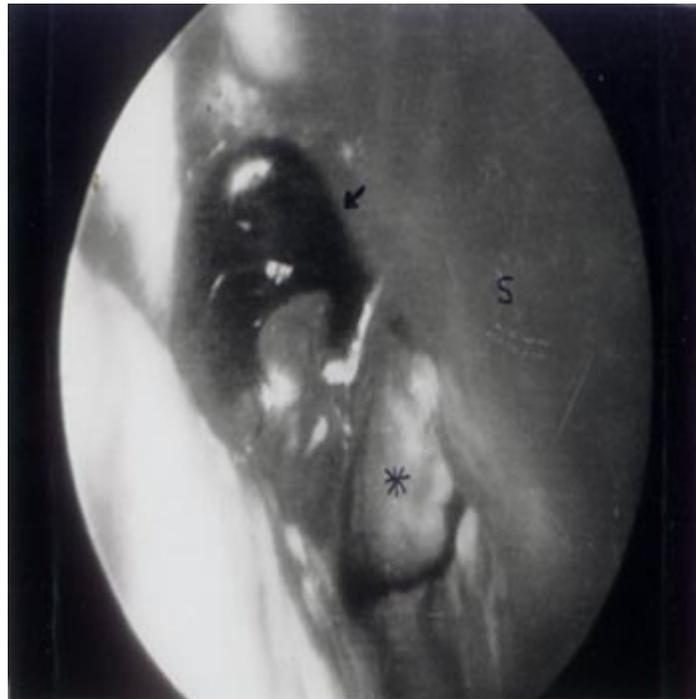


Fig 4 Endoscopic view showing patency of the stoma as checked with methylene blue, methylene blue coming out of the stoma, \* the middle turbinate, s the septum.

### Observations and results

In the study conducted from January 1996 to May 1999 the following observations were made:

The maximum incidence of patients was between the ages of 31-40 years. There were more male patients (62.50%) than female patients (37.50%). There were 6 right and 10 left DCRs performed. 12 patients gave history of previous DCR surgery out of which 10 patients had been operated externally while 2 patients had undergone previous endoscopic DCR surgery.

Five patients had a deviated nasal septum, out of which three patients underwent septoplasty surgery at the same sitting while two patients had septal reconstruction prior to endoscopic surgery. Two patients had atrophic rhinitis, which was controlled preoperatively by appropriate medical therapy. One patient had developed nasolacrimal duct obstruction following previous sinusoscopic widening of the maxillary antrum. One patient had congenital nasolacrimal duct obstruction in which repeated probing had failed to relieve the symptoms. However, in the remaining 7 patients an aetiological factor could not be identified.

The use of an endoilluminator proved to be an excellent guide for localisation of the sac area in difficult cases such as in revision cases with fibrosis or granulation tissue formation.

Our experience with stenting the operative site is variable. In one revision case, the patient had undergone two previous external DCR surgeries with stenting, which had failed. An endoscopic DCR was done. At this time, no stent was inserted. The healing process was monitored closely during the postoperative period. During regular follow-up over 18 months, the stoma has remained patent and the patient has had no recurrence of symptoms. In two other revision cases with previous failed external attempts, a stent was inserted after endoscopic surgery. In one of these patients, the tract remained patent. The second patient developed a mucocele and the tract closed down. Since most of our patients did well without any stenting, we believe that stenting is not necessary in every patient, provided the patients are followed up regularly in the postoperative period.

The use of Mitomycin C to maintain the fistula has been described in literature.<sup>[1]</sup> we used Mitomycin C in a single patient with good results. However, further study needs to be done for confirming the efficacy of this method.

There were no significant intraoperative complications. Intraoperative bleeding significant enough to hamper surgery was encountered in three patients. Two patients required temporary temponade with gelfoam before

surgery could be continued further. These patients did well postoperatively. One patient required packing with vaseline gauze for 48 hrs. The stoma restenosed within a month of surgery in this patient.

In the immediate postoperative period, periorbital swelling due to orbital emphysema occurred in two cases, which subsided in 3-4 days with local treatment. There were no episodes of significant epistaxis, orbital haematoma, diplopia or blindness.

At the end of six months, 14 out of 16 patients were relieved of their symptoms completely. Two patients continued to have persistent epiphora. The success rate was 87.5% which compares favourably with external DCR.

## DISCUSSION

On analysis we believe that the cause for failure of endoscopic DCR surgery could be granulation and scarring near the stoma, an obliterated small atrophic sac, inadequate size of the bony window in the lacrimal bone, impaired canalicular function (existing preoperatively), technical error in locating the sac and intra-operative bleeding obliterating the field of vision.

For successful endoscopic DCR, the following points should be considered.

- The stoma made in the bone and medial wall of the sac should be wide enough. In our study, it averaged 10 mm in diameter.
- The edges of the stoma should be smooth.
- Care should be taken to avoid damage to the surrounding mucosa, so as to avoid formation of synechiae and narrowing of the stoma.
- Bare bone should not be left exposed.
- An attempt should be made to minimize intraoperative bleeding and avoid post-operative packing of nose.
- Post-operative check-ups with sac syringing and check endoscopy must be made often enough so as to prevent synechiae and restenosis.
- A significant advantage is that the medial canthus tendon is not at risk of injury during endoscopic DCR.[3]

## CONCLUSION

The following conclusions were made.

- 1.Endoscopic DCR surgery is appropriate for both primary and revision cases after a failed external DCR.
- 2.Endoscopic DCR should be considered in young patients and in patients who wish to avoid a facial scar.
- 3.Associated nasal pathologies can be corrected at the same time as that of endoscopic DCR.
- 4.The success rate was 87.5%, which compared favourably with external DCR.
- 5.Regular post-operative follow up is necessary following endoscopic DCR
- 6.An endoilluminator serves as an excellent guide in localising the sac area in difficult cases.
- 7.The role of antimetabolites like Mitomycin C in preventing fibrosis of the stoma needs to be studied further.
- 8.In our study, patients did well without any stenting procedure provided their post-operative healing was monitored endoscopically on a regular basis.

Endoscopic DCR can be considered as a safe alternative to the external approach.

## REFERENCES

- 1.Javate RM, Campomanes BS, Co ND, Dinglasen JI, Go CG, Ton EN, et al. The endoscope and the radiofrequency unit in DCR surgery. *Ophthalmology and Plastic Reconstruction Surgery* 1995; 11 : 54-58.
- 2.McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. *The Journal of Laryngology and Otology* 1989; 103 : 585-87.

3. Rice DH. Endoscopic intranasal dacryocystorhinostomy - results in four patients. Archives of Otolaryngology and Head Neck Surgery 1990; 116 ; 1061.
4. Rice DH. Endoscopic intranasal dacryocystorhinostomy : a cadaver study. American Journal of Rhinology 1988; 2 : 127-28.
5. Srekelsen MB, Barberan MT. Endoscopic dacryocystorhinostomy - surgical technique and results. Laryngoscope 1996; 106 : 187-89.

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