ORIGINAL CONTRIBUTION

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Endoscopic revision of external dacryocystorhinostomy failure*

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SUMMARY

Objective: *To evaluate the usefulness of endoscopic analysis and surgery of the lacrimal sac in cases of external dacryocystorhinostomy (DCR) failure.*

Material & method: *In a retrospective study, 17 endoscopic procedures in 17 patients during 11 years with recurrent lacrimal obstruction after external DCR were performed. Endoscopic analysis and procedures were carried out with a routine silicone tube catheterization for 3 to 6 months.*

Results: *In 13 patients, scar tissue was the cause of the obstacle, while in 3 patients an unsuitable location of the ostia and in 1 case an inflammatory polyp were found. After a long-term follow-up (56 months), the epiphora was controlled in 94% of the cases. The mean delay between the first DCR and the recurrence of epiphora was 22 months.*

Conclusion: *A persistent or recurrent epiphora can be explored after an external procedure and treated by endoscopic procedure. The endonasal approach for DCR was considered safe, and effective particularly in patients with unsuccessful external DCR.*

Key words: epiphora, endoscopic DCR, external DCR failure

INTRODUCTION

Epiphora is a classical symptom for ophthalmologists. However, with the development of endoscopic dacryocystorhinostomy (DCR), this condition has increasingly been observed in ENT consultation. Since Toti, who first described the technique [(1)], DCR has constantly been improved. The endoscopic procedure has increasingly been developed since the beginning of the eighties [(2,3)]. Failures of this external surgical procedure are considered rare. At our institution, the majority of DCR was an external procedure, performed by ophthalmologists. Patients with persistent epiphora after this procedure were subsequently referred to ENT consultation for further evaluation and treatment of the unsuccessful procedures. The aim of this study was to evaluate the efficacy of the endoscopic procedure in order to treat recurrent epiphora after external DCR in 17 consecutive patients.

MATERIALS AND METHOD

Study design

This retrospective study includes a total of 17 consecutive cases treated between 1996 and 2007 at our ENT department. The study was started in 1996 with the arrival of DCR in our institution and stopped in 2007 in order to obtain adequate follow-up.

Dacryocystorhinostomy

External DCR was carried out in the Ophthalmologic Department and patients with recurrent epiphora were referred after they had completed lacrymal tests and evaluation of the recurrent aetiology in the ENT department. The external DCR was proposed first by an ophthalmologist. In our routine practice, it was easier to organize external procedure, which was carried out by an ophthalmologist alone under local anaesthesia. A silicone probe was not routinely inserted in the external procedure, and was reserved for specific difficult cases (failure, common canaliculus stenosis, important fibrosis, etc). The endoscopic procedure was reserved for specific cases (cheloid scar, young patients, etc.). The preoperative lacrymal assessment, to confirm the distal nasolarymal duct obstruction, included lacrymal probing, irrigation of the nasolacrymal system, and a fluorescein clearance test. All patients were assessed prior to surgery by nasal endoscopic examination for sinonasal pathology or anatomical anomaly and an otolaryngological examination completed the procedure. A preoperative sinus CT scan was routinely performed, but without dacryocystography due to the quality of the information obtained on the CT scan. A coupled tomodensitometry (TDM) and dacryography examination permit to obtain complete information, but was not routinely preformed at our institution and was

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reserved only for cases with incomplete data in the standard pre-operative assessment.

These patients were operated on by DCR endoscopic procedure, which was carried out under general anaesthesia. Nasal packing soaked in lidocaine and naphtazoline was placed along the lateral wall. The patient was draped with the nose and both eyes in the surgical field. When we first started this procedure, the lateral nasal wall was infiltrated with 2 ml of 1 % lidocaine and 1 % epinephrine. The infiltration has now been abandoned to avoid further bleeding. A video camera was attached to a 4-mm-diameter nasal endoscope (0 or 30° viewing angle) during the entire procedure. A nasal endoscopy with an assessment of the lacrimo-nasal obstacle was carried out and the anomalies were recorded. To facilitate the identification of the lacrymal sac a lacrimal probe was inserted via a canaliculi in the sac.

The obstruction area was identified and then opened; the scar and residual bone were removed with cold instruments and an anguled specific powered instrument (High speed curved DCR 15°, 4mm, Medtronic-Xomec INC, FL, USA). The optimal location for the stoma was against the common canaliculus 5 mm anterior to the middle turbinate attachment and above 10 mm to the free border of the uncinate process. The residual lacrymal sac was incised and the orifice regularised. If the ethmoid, like Agger nasi cell, was the origin of the obstacle (suspected in pre-operative assessment) it was opened during endonasal surgery. No pus was observed in the residual lacrimal pathway. A bicanalicular silicon lacrimal stent was placed at the end of the procedure and later removed after 3 to 6 months. Nasal anatomical alterations such as synechiae or granulation tissue caused by the previous surgery were corrected during this procedure. No nasal packing was used. The lacrymal drainage was tested by irrigation of the superior and inferior canaliculi with 14‰ saline solution. Large nasal irrigation was performed at the end of the procedure with 14‰ saline solution. The patient was discharged 1 day after surgery for the initial patients in this study. Currently, this procedure is carried out on an out-patient basis carried out in one day surgery. Postoperative medications included antibiotic-steroid eye drops, saline nasal irrigations and corticoid nasal spray. The same ophthalmologist performed the postoperative evaluation with the same test as the preoperative period (irrigation of the nasolacrymal system, and a fluorescein clearance test). The otolaryngologist evaluated the results at 6 weeks after surgery and evaluated the endonasal stoma twice a year until 2 years. The patient was then referred to their original specialist (ophthalmologist).

RESULTS

This study included 17 consecutive patients with recurrent epiphora after external DCR. The population was consisted of 13 women and 4 men with an average age of 55 years (range 19 to 82). The median follow-up was 56 months (range 14 to 148). The mean delay between the first external DCR and the recurrence of epiphora was 22 months (range 2 to 133).

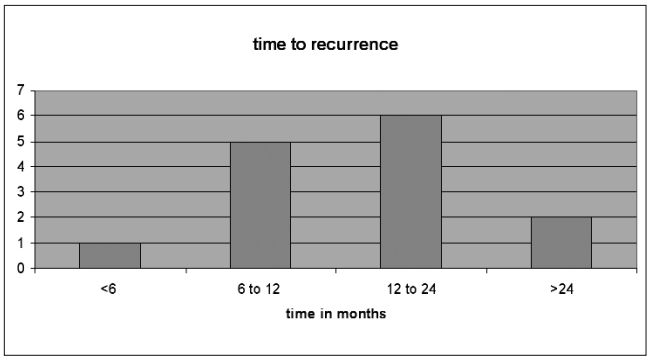

Figure 1. Evaluation of the delay of recurrence, with the majority occuring between 6-24 months.

Evaluation of the delay of recurrence showed that some of the patients had a short period of recurrence, but the majority of these recurrences appeared between 6 to 24 months after surgery, while some rare cases appeared later (Figure 1). DCR endoscopic assessment during the surgical procedure revealed 3 cases with incomplete removal of the medial bone wall of the lacrymal sac, 1 granuloma and 13 tissue scars. No cases of small lacrimal sac or obstruction at the Rosenmuller valve were diagnosed. No intra- or post-operative complications were observed and pain was controlled with standard analgesic (paracetamol). Epiphora was controlled in 16 (94%) of 17 patients. The sole failure patient presented with an extensive facial traumatic injury and multiple deformities. The lacrymal duct was tested after silicon tube removal by the flow of fluorescein dye from the eye to the nasal ostia observed on nasal endoscopy.

Stents were left in place during 3 to 6 months and was then removed when the inflammation of the ostia had disappeared or when lacrimal punctual stretching appeared. No punctual slitting or ostia granuloma was observed and the healed stoma seemed to be completely adapted.

DISCUSSION

The external or endoscopic primary DCR success rate was 90 % [4-8]. Unsuccessful cases are rare, however, the origin of failure has to be further evaluated. The interest in endoscopic DCR revision was to visualize and directly treat the main factor of failure. The endoscopic approach seems to be superior to the external approach [9]. The advantages of the endoscopic procedure are now well known: no cutaneous scar, no injury of the lacrymal pump and less bleeding due to the procedure [10]. Our population was similar to that reported in the literature [7,8,11-15] and our surgical technique was performed using the standard procedure, with cold instruments. Laser was not used by some authors due to thermic effects and the high risk of scar tissue found with this procedure [9,16,17]. Piaton et al. [18], in first line DCR, compared diode laser with electrocautery instruments (ECI). Intraoperative haemorrhages were fewer and smaller, visibility was better, the duration of the procedure

Table 1. Results of endoscopic revision DCR.

Authors	Year of publication	Number of patients	Success rate
Metson [4]	1990	12	75 %
El-Guindy et al. [7]	2000	21	83 %
Demarco et al. [8]	2007	11	91 %
Our series		17	94 %

was shorter in the diode laser assisted procedures than in ECI assisted procedures; also the use of the diode laser was painless. In the postoperative follow-up, the frequency of granuloma formation was similar with the two instruments, synechiae were fewer with the diode laser and similar to the crusting reaction of the nasal mucosa and success rates were the same [18]. At our institution, endoscopic DCR was carried out under general anaesthesia and more recently for patients after outpatient hospitalization.

The most frequent occlusion of the nasal ostia was scar tissue in our experience, which has also been reported in the literature [7,9,16,17]. Some authors reported nasal deformities (synechia, hypertrophic middle turbinate, septal deformation) [7,8] as a factor of failure, which however, was not confirmed in our study. For Welham et al. [14], in their analysis of unsuccessful lacrymal surgery, the reasons for failure were inappropriate size or location of ostia and common canalicular obstruction. In our experience, the initial size was not a risk for lack of success as reported by other authors [19], nevertheless the inadequate place could be a factor of failure (3 cases in our series) [20].

With endoscopic angled instruments, the opening of the lacrymal drainage was easy and the ostia was created with minimal injury and cleared, enlarged, properly positioned and regularised. Our results with a success rate of 94 % were close to that reported in the literature (Table 1). The use of silicone tubing has been underlined in the literature as for some authors this tubing approach induced a granulomatous reaction [21-23] whereas for others [8,15] it was used to prevent the recurrent closure of the lacrymal opening. For other authors [24-26] silicone tubing was not required as the success rate was similar with or without the tubing, and the use of a probe increased the cost as well as being uncomfortable. Some authors used it as a routine procedure, whereas others used it in selected cases such as in severe lacrymals sac fibrosis or in cases of revision surgery [7,9,12].

Routine silicone tubing was used in our patients and no granulation tissue was observed at the post-operative follow-up endoscopic control and patients had no major complaint. As reported in the literature [8,27], the stent was left in place during 3 to 6 months and was removed when the inflammation of the ostia had disappeared. The difficulty of these cases was due to the failure of the first DCR, as reported by several authors [27,28] and probing was indicated in those typical cases.

The follow-up of this series was significant and permitted a specific assessment of recurrence. The period possibly at risk for recurrence was 6 to 24 months after primary surgery. Frequent nasal cleaning with saline solution was fundamental to the surgical success but in our experience, removal of crust, scar and tissue granulation was not helpful as previously reported [5,8,29]. Permanent flow via the lacrymal system was also assured by antibio-corticoid eye drops and steroid nasal spray [8].

The high success rate, the very low rate of complication, and the endoscopic evaluation suggests that this approach could be performed in all cases of DCR failure with the exception of major facial injury.

CONCLUSION

The number of cases in this series was too limited to draw any conclusions, but DCR failure remains rare. The use of a nasal rigid endoscope permitted an accurate analysis of the lacrymal obstacle. A persistent or recurrent epiphora after an external procedure can be explored and treated by the DCR endoscopic procedure. The endonasal approach for DCR could be considered as a safe and effective method, particularly in patients with unsuccessful external DCR.

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REFERENCES

1. Toti A. Nuevo metodo conservatore di cura radicale delle supporazini chronice del sacco lacrymale. Clin Med Firenze. 1904; 10: 385-359.
2. Rouvier P, Vaille G, Garcia C, Teppa H, Freche C, Lerault P. La dacryocystorhinostomie par voie endonasale, Ann Otolaryngol. (Paris) 1981; 98: 49-53.
3. Steadman MG. Transnasal dacryocystorhinostomy. Otolaryngol Clin North Am. 1985; 18: 107-111.
4. Metson R. The endoscopic approach for revision dacryocystorhinostomy. Laryngoscope. 1990; 100: 1344-1347.
5. Weidenbecher M, Hosemann W, Buhr W. Endoscopic endonasal dacryocystorhinostomy: results in 56 patients. Ann Otol Rhinol Laryngol. 1994; 103: 363-367.
6. Sham CL, van Hasselt CA. Endoscopic terminal dacryocystorhinostomy. Laryngoscope. 2000; 110: 1045-1049.
7. El-Guindy A, Dorgham A, Ghoraba M. Endoscopic revision surgery for recurrent epiphora occurring after external dacryocystorhinostomy. Ann Otol Rhinol Laryngol. 2000; 109: 425-430.
8. Demarco R, Strose A, Araújo M, Valera FC, Moribe I, Anselmo-Lima WT. Endoscopic revision of external dacryocystorhinostomy. Otolaryngol Head Neck Surg. 2007; 137: 497-499.
9. Sprekelsen MB, Barberán MT. Endoscopic dacryocystorhinostomy: surgical technique and results. Laryngoscope. 1996; 106: 187-189.
10. Hartikainen J, Grenman R, Puukka P, Seppä H. Prospective randomized comparaison of external dacryocystorhinostomie and endonasal laser dacryocystorhinostomie. Ophtalmology. 1998; 105: 1106-1113.
11. Mickelson SA, Kim DK, Stein IM. Endoscopic laser-assisted dacryocystorhinostomy. Am J Otolaryngol. 1997; 18: 107-111.
12. Mannor GE, Millman AL. The prognostic value of preoperative dacryocystography in endoscopic intranasal dacryocystorhinostomy. Am J Ophthalmol. 1992; 113: 134-137.

13. Nerci M, Orhan M, Erdener U. Intranasal endoscopic surgery with silicone intubation for lacrimal obstruction. Am J Rhinol. 1996; 10: 93-95.
14. Welham RA, Henderson PH. Results of dacryocystorhinostomy analysis of causes for failure. Trans Ophthalmol Soc UK. 1973; 93: 601-609.
15. Boush GA, Lemke BN, Dortzbach RK. Results of endonasal laser-assisted dacryocystorhinostomy. Ophthalmology. 1994; 101: 955-959.
16. Woog JJ, Metson R, Puliafito CA. Holmium:YAG endonasal laser dacryocystorhinostomy. Am J Ophthalmol. 1993; 116: 1-10.
17. Pearlman SJ, Michalos P, Leib ML, Moazed KT. Translacrimal transnasal laser-assisted dacryocystorhinostomy.Laryngoscope. 1997; 107: 1362-1365.
18. Piaton JM, Keller P, Limon S, Quenot S. First line endonasal dacryocystorhinostomy Technique and results. Comparison between diode laser and electrocautery instrument. Study based on 422 procedures. J Fr Ophtalmol. 2002; 25: 135-145.
19. Lindberg JV, Anderson RL, Bumsted RM, Barreras R. Study of intranasal ostium external dacryocystorhinostomy. Arch Ophtalmol. 1982; 100: 1758-1762.
20. Talks SJ, Hopkisson B. The frequency of entry into an ethmoidal sinus when performing a dacryocystorhinostomy. Eye. 1996; 10: 742-743.
21. Allen KM, Berlin AJ, Levine HL. Intranasal endoscopic analysis of dacrocystorhinostomy failure. Ophthal Plast Reconstr Surg. 1988; 4: 143-145.
22. Walland MJ, Rose GE. Factors affecting the success rate of open lacrimal surgery. Br J Ophthalmol. 1994; 78: 888-891.
23. Hartikainen J, Antila J, Varpula M, Puukka P, Seppä H, Grénman R. Prospective randomized comparison of endonasal endoscopic dacryocystorhinostomy and external dacryocystorhinostomy. Laryngoscope. 1998; 108: 1861-1866.
24. Unlü HH, Oztürk F, Mutlu C, Ilker SS, Tarhan S. Endoscopic dacryocystorhinostomy without stents. Auris Nasus Larynx. 2000; 27: 65-71.
25. Smirnov G, Tuomilehto H, Teräsvirta M, Nuutinen J, Seppä J. Silicone tubing after endoscopic dacryocystorhinostomy: is it necessary? Am J Rhinol. 2006; 20: 600-602.
26. Smirnov G, Tuomilehto H, Teräsvirta M, Nuutinen J, Seppä J. Silicone tubing is not necessary after primary endoscopic dacryocystorhinostomy: a prospective randomized study. Am J Rhinol. 2008; 22: 214-217.
27. Küpper DS, Demarco RC, Resende R, Anselmo-Lima WT, Valera FC, Moribe I. Endoscopic nasal dacryocystorhinostomy: results and advantages over the external approach. Rev Bras Otorrinolaringol (Engl Ed). 2005; 71: 356-360.
28. Allen KM, Berlin AJ. Dacryocystorhinostomy failure association with nasolacrimal silicone intubation. Ophtalmis Surg. 1982; 20: 486-489.
29. Metson R, Woog JJ, Puliafito CA. Endoscopic laser dacryocystorhinostomy. Laryngoscope. 1994; 104: 269-274.

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