ORIGINAL ARTICLE

Endoscopic Dacryocystorhinostomy without Probing: Surgical Outcome

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Abstract

Ninety-eight cases of nasolacrimal duct obstruction including 6 bilateral cases were included in the study done at Postgraduate Institute of Medical Research, Chandigarh. All the cases had been divided into three groups with Group I including cases in which 12 endoscopic dacryocystorhinostomy (DCR) with dilatation and probing and stent insertion were performed. In Group II, 23 Endo DCR performed with intraoperative dilatation and probing but no stent insertion. Group III included 69 cases of Endo DCR without dilatation and probing and no stent insertion. Overall success rate was found to be 94.3% with Group III cases having a success rate of 97.1% and was found statistically significant on comparing with that of Group II (p value: 0.03).

Keywords: Endoscopic dacryocystorhinostomy, probing, outcome.

Endoscopic transnasal dacryocystorhinostomy (EDCR), first described by McDonogh and Meiring[1]in 1989, is indicated for patients with nasolacrimal duct obstruction (NLDO) which can be congenital or acquired.

With the advent of the rigid fiberoptic endoscope and its use in nose and paranasal sinus surgery, a renewed interest has developed over the past decade in endoscopic surgery for the correction of primary[2] and recurrent[3] lacrimal obstruction. This procedure has a potential advantage over the standard external approach (EXT DCR) as it avoids facial cosmetic scars, reduces operating time, intraoperative bleeding and morbidity. Most of the series are reported with the procedure being performed under general anesthesia but recently there are reports of procedure being performed under local anesthesia with equal results.[4,5]

Almost all series[5-8] have stressed upon the need of probing of nasolacrimal duct to locate and confirm the site of lacrimal sac. We have carried out this study to see that whether intraoperative probing can change the surgical outcome?

MATERIALS AND METHODS

All patients who presented with symptoms of chronic dacryocystitis from January 1998 to December 2006 were enrolled in this study. We had 98 cases who underwent EDCR, of which six cases had undergone bilateral EDCR, so a total of 104 EDCR were performed. Their age ranged from 7 to 72 years. A detailed history, general physical examination, local examination including detailed otorhinolaryngological examination, sac test and nasal endoscopy to see the accessibility of maxillary line, were conducted on all patients. Other causes of epiphora were excluded. All patients were operated under general anesthesia and were given oral antibiotic for 7 days postoperatively. The patients were divided in three groups. Group I included 12 cases in which intraoperative dilatation of the punctum and probing of the canaliculi was done and a stent was inserted postoperatively. Group II included 23 cases where intraoperative dilatation and probing was performed but no stent was inserted. Group III included 69 cases who had undergone EDCR without dilatation and probing and no stent was inserted. The patients were followed up at a regular interval of one week, one month, three months and six months postoperatively and the data was statistically analyzed.

SURGICAL PROCEDURE

The nasal cavities were packed with 4% xylocaine and adrenaline solution (1 in 1,00000) soaked ribbon gauze, fifteen minutes before operation. 0 and 30° Hopkins rod endoscopes were used for the procedure. The maxillary line, demarcating the junction of the frontal process of maxilla

and the lacrimal bone, was identified. The mucosa anterior and superior to anterior end of middle turbinate was infiltrated with 1% xylocaine and adrenaline solution (1 in 2,00000).

An incision was made anterior to the maxillary line in front of the anterior end of the middle turbinate. An inferiorly based mucosal flap was elevated and the frontal process of maxilla and lacrimal bone were identified. The anterior wall of the lacrimal sac was exposed in its superior part where the common canaliculus enters the sac. The lacrimal sac could be confirmed as tenting by pressing the medial canthal region and the sac was incised. The redundant medial wall was also excised. A bead of pus coming out with pressure, was seen in 72.46% cases after incising the medial wall. A small neosporin soaked nasal pack was put for 24 hours and the patient was discharged either the same day or next day of surgery and were kept on regular follow-up. Subjective improvement in epiphora was taken as criteria of successful outcome.

RESULTS

Ninety-nine patients (51 males and 48 females) had undergone endoscopic DCR (104 EDCR). Group I included 12 cases [7 males and 3 females (2 females: Bilateral EDCR)]. Group II had 23 cases (13 males and 10 females) and Group III included 69 patients [31 males (1 male: bilateral EDCR) and 35 females (3 females: bilateral EDCR]. The data was analyzed using chi square test. Since no statistically significant difference (p value = 0.52), (p value < 0.5), (p value < 0.5) was found amongst different sex of all three groups so were combined together for further analysis. The age range of all cases was from 7 to 72 years with a mean age of 39.5 years. Six patients (8.8%) had bilateral dacryocystitis. Coexistent nasal pathology like allergic rhinitis was found in 12 patients (17.3%). Five patients (7.2%) had gross deviated nasal septum for which endoscopic septoplasty was done before proceeding to EDCR in the same sitting. One referred case of failed external DCR in Group II and 2 referred cases of failed endo DCR in Group III had undergone revision surgery. At three months of follow-up, 98 eyes were found to be dry and comfortable. 91.6% (11 cases) cases of group I, 86.9% (20 cases) of Group II and 97.1% (67 cases) of Group III showed improvement with over all success rate of 94.3% (Figs 1 and 2). The success rates of different surgical modalities were compared using the test of proportion. The difference was seen on comparing the success rates in Group I and II with p value of 0.338, in Group II and III with p value of 0.03 (statistically significant), and in Group III and I with p value of 0.178.

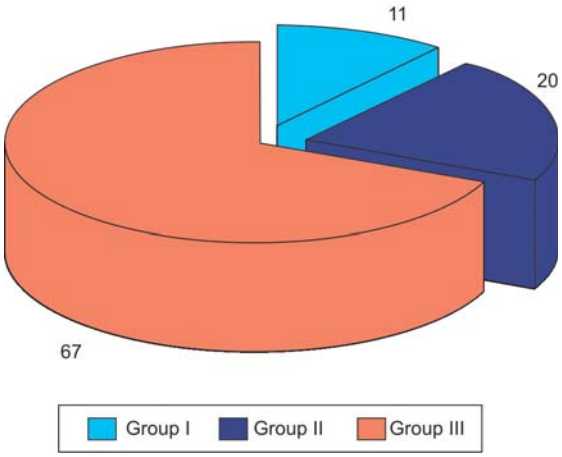

Fig. 1: Successful cases in all three groups

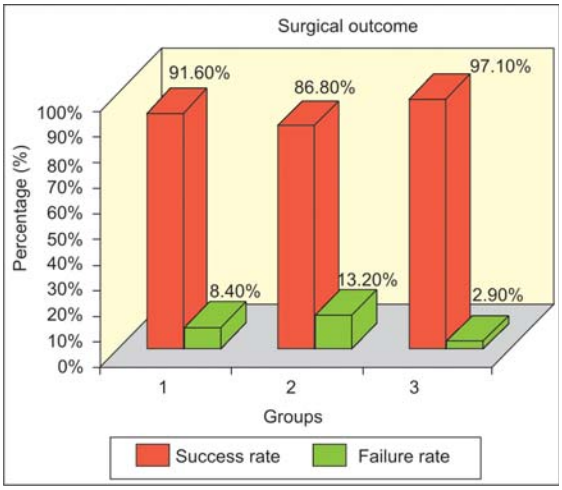

Fig. 2: Surgical outcome in all three groups

The failure was because of canalicular stenosis in one case each of Group I and II. Another case in Group II failed because of punctal injury. One case in Group II and 2 cases in Group III developed synechiae postoperatively. Out of six cases (5.7%), who failed to EDCR, a revision surgery was done in three cases, out of which two recovered and the third case had missed to follow-up. The other three cases could not be considered for surgery because of punctal injury and canalicular stenosis. The results were almost the same after 6 months of follow-up in all the patients.

DISCUSSION

An overall success rate of 94.3% was recorded in this series of EDCR after 6 months of follow-up. English literature reports a success rate of 75 to 99% with external DCR[6] compared to 82 to 95% with EDCR without the use of laser and with the use of laser, little lower, i.e. 77 to 83%.[7]

An endoscopic septoplasty was required in five cases where the exposure was inadequate due to gross deviated nasal septum. A wide intranasal stoma as well as adequate removal of bone around the stoma are needed to reduce the chances of postoperative stenosis and adhesions resulting in good success rate. Inadequate removal of bone is the commonest cause of postoperative stomal stenosis.[9] The use of powered instruments and lasers are known to cause increased granulations resulting in fibrosis and scarring.[10] We had used Kerisson punch to remove the frontal process of maxilla but in 8 patients, drill was used in which the bone was found to be very thick but none of these patients had postoperative stenosis, probably because of good irrigation done at the time of drilling. Whittet et al[11] has stressed upon the need of preoperative computed tomography (CT scan) and dacryocystogram to evaluate the paranasal sinuses and lacrimal apparatus. However, we found that CT scan does not offer an additive advantage.

The reported outcomes of EDCR and related procedures are summarized in Table 1.[5,6,12-16] The routine use of silicone stenting was advocated by Durvasula et al[5] but reported granuloma formation in one patient and punctal stenosis in 2 patients. Failure following stent insertion is due to granuloma formation, synechiae or punctal erosions.[17] Premature extrusion of stent has been reported to be the commonest complication. However, Durvasula[5] has reported good results with use of stents after 3 months. Unlu et al[18] has reported 85.7% success rate in patients with use of silicone stent and 87.5 % in patients without stent. We had a success rate of 91.60% in the patients with stent insertion (Group-III) and 86.8% and 97.1%, without stent insertion in Group II and III respectively. Zilelioglu et al[19] reported lacerations of puncta due to probing and bicanalicular silicone intubation in 3.1% of his cases. In our study, 12 cases of Group I and 23 cases in Group II, the conventional method of probing was used to confirm the site of lacrimal sac and then syringing through the punctum was done to see the free flow, where canalicular stenosis and punctal injury were seen in 2.8% (3 cases).

In a study, a postal survey was conducted which revealed 83% success rate with a mean follow-up of 28.6 months.[5] We had a follow-up of patients after one week, one month, 3 months and 6 months after surgery. Evaluation of postoperative results involved subjective improvement of epiphora[20,21] as in our study. Some of the authors have however, used the objective methods to monitor patients.[3,22] The reported common complications include hemorrhage, breach of lamina papyracea, herniation of orbital fat and orbital hemorrhage. But none of our patients in our series had any of these complications. By avoiding dilatation and probing of the punctum, the chances of trauma and granuloma (localized mass of granulation tissue) formation, canalicular and punctal stenosis, ecchymosis around the canthal area (purplish patches around the corner of the upper and the lower eyelids), minor cheek hematoma and increased intraoperative time can be avoided.

EDCR without probing has good functional results as explained by the patency of the nasolacrimal duct by the pumping action of orbicularis oculi muscle.[23] A good knowledge of the anatomy and variations in lateral nasal wall is essential. As with any surgical procedure, a learning curve is involved and the outcome can be expected to improve with time.

We found a success rate of 91.6% and 97.1% for Group I and Group II respectively. The statistic evaluation amongst these groups does not show any significant difference (p value = 0.178) which means that insertion of a stent in cases with EDCR does not change the surgical outcome. However, the difference in Group II and III is statistically significant (p value = 0.03) which simply means that repeated dilatation and probing of NLD during surgery reduces the surgical outcome because of trauma induced during dilatation.

We acknowledge more benefits with the procedure being performed in Group III. Thus it can be concluded that repeated intraoperative dilatation and probing through the punctum and syringing can predispose to complications and can reduce the chances of surgical outcome, hence not much of use in EDCR.

Table 1: Results of primary endoscopic dacryocystorhinostomy

Investigators	N	Success rate (%)	Comments
Tripathi et al, 2002[6]	46	89	Success; local anesthesia
Tsirbas, Wormald, 2003[12]	44	89	Lacrimal and nasal mucosal flaps
Massegur et al, 2004[13]	96	93	Hammer-Chisel, mucosal flaps
Fayet et al, 2004[14]	300	87	Conventional DCR
Durvasula, Gatland, 2004[5]	70	92	Conventional DCR
Wormald, Tsirbas, 2004[15]	70	97	Success anatomic obstruction
Javate and Pamintuan, 2005[16]	117	98	Radiofrequency, double stent mitomycin C
Present study	104	97.1	without dilatation and probing NLD

REFERENCES

1. McDonogh M, Meirig JH. Endoscopic transnasal dacrocystorhinostomy. J Laryngol Otol 1989;100:585-87.
2. Benger R, Forer M. Endonasal dacryocystorhinostomy: Primary and secondary. Aust NZJ Ophthalmol 1993;21(3):441-42.
3. Metson R. The endoscopic approach for revision dacryocystorhinostomy. Laryngoscope 1990;100(12):1344-47.
4. Tripathi A, Lesser J, O'Donneli NP. Local anaesthetic endonasal endoscopic dacrocystorhinostomy: Analysis of patient acceptability and various factors affecting the success of the procedure. Eye 2002;16:146-49.
5. Durvasula VSP, Gatland DJ. Endoscopic dacrocystorhinostomy: Long-term results and evolution of surgical technique. J Laryngol Otol 2004;118:628-32.
6. Allen K, Berlin AJ. Results of endoscopic KTP I Laser assisted dacrocystorhinostomy. Ophthalmol Plast Reconstr Surg 1989;20:486-89.
7. Mantymen J, Yoshitsugu M, Rautiamen M. Results of dacrocystorhinostomy in 96 patients. Acta Otolaryngol Supp (Stockholm) 1997;529:187-89.
8. Cokkerser Y, Everekilogiu C, Hamdi ER. Comparative external versus endoscopic dacrocystorhinostomy: Results in 115 patients (130 eyes). Otolaryngol Head Neck Surg 2000;123:488-91.
9. Weiham RA. Management of unsuccessful lacrimal surgery. Br J Ophthalmol 1987;71:152-57.
10. Yung MW, Hardman Lea S. Endoscopic interior dacrocystorhinostomy. Clin Otolaryngol 1998;23:152-57.
11. Whittet HB, Shun Shin GA, Awdry P. Functional endoscopic transnasal dacrocystorhinostomy: Eye 1993;7:545-49.
12. Anderson RL, Edwards JJ. Indications, complications and results with silicone stents. Opthalmology 1979;86:1474-87.
13. Unlu HH, Toprak B, Aslan A. Comparison of surgical outcomes in primary endoscopic dacrocystorhinostomy: With or without silicon intubation. Ann Otol Rhinol Laryngol 2002;111(8): 704-09.
14. Zilelioglu G, Tekeli O, Ugurba SH, Akiner M. Results of endoscopic endonasal non-Laser dacrocystorhinostomy. Doc Ophthalmol 2002;105(1):57-62.
15. Eloy P, Bertrand B. Martinez M, Hoebeke M. Endonasal dacrocystorhinostomy. Indications, technique and results. Rhinology 1995;33:229-33.
16. Spreckelsen MB, Barberan MT. Surgical technique and results. Laryngoscope 1996;106:187-89.
17. Pearlman SJ, Michalos P, Leib ML. Translacrimal transnasal Laser assisted dacrocystorhinostomy. Laryngoscope 1997;107:1362-65.
18. Ezra E, Restori M, Mannor GE, Rose GE. Ultrasonic assessment of rhinostomy size following external dacrostorhinostomy. Br J Ophthalmol 1998;82:786-89.
19. Tsirbas A,Wormald PJ. Endonasal dacryocystorhinostomy with mucosal flaps. Am J Ophthalmol 2003;135(1):76-83.
20. Massegur H, Trias E, Adema JM. Endoscopic dacryocystor-hinostomy: modified technique.Otolaryngol Head Neck Surg 2004;130(1):39-46.
21. Fayet B, Racey E, Assouline M. Complications of standardized endonasal dacryocystorhinostomy without uncinectomy. Ophthalmology 2004;111(4):837-45.
22. Wormald PJ, Tsibas A. Investigation and endoscopic treatment for functional and anatomical obstruction of the nasolacrimal duct system. Clin Otolaryngol Allied Sci 2004;29(4):352-56.
23. Javate R, Pamintuan F. Endoscopic radiofrequency: Assisted dacryocystorhinostomy with double stent: a personal experience. Orbit 2005;24(1):15-22.