External Versus Endoscopic Dacryocystorhinostomy: A Retrospective Study

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Abstract

Background: External dacryocystorhinostomy (DCR) has been the standard surgery for nasolacrimal duct obstruction before the development of endoscopic DCR.

Methods: This retrospective study included 103 patients with 109 cases (6 cases with bilateral disease) of nasolacrimal duct obstruction, of which 55 were treated with external DCR and 54 with endoscopic DCR. They were followed up for a minimum period of six months for surgical outcome.

Result: The mean age of the patients in both the groups was 30 years. The success rate defined as absence of epiphora in the external DCR group was 90.9% and 95 % in the endoscopic DCR group. Majority of the recurrence, 5 out of the 6 (83.3%) in the external DCR group occurred in the first two months of surgery, while one reported four months after the surgery. The problem of intraoperative hemorrhage encountered in the external DCR group was not faced in the endoscopic DCR group. Revision of DCR was indicated in 9.1 % of cases in external DCR group as compared to 5.5 % in the endoscopic group. Serious complications like keloid formation and cosmetically unacceptable scar were not noticed in the external DCR group. Cerebrospinal fluid (CSF) rhinorrhoea was not encountered in the endoscopic group.

Conclusion : Both the external DCR and the endoscopic DCR are effective surgical approaches for nasolacrimal duct obstruction with comparable success rate.

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Key Words : External dacryocystorhinostomy; Endoscopic dacryocystorhinostomy

Introduction

Normal drainage of tear from the conjunctival sac into the nose is dependent on patency of the nasolacrimal passage that includes the lacrimal puncta, the lacrimal canaliculi, the common canaliculus, the lacrimal sac and the nasolacrimal duct, which opens into the inferior meatus of the nose. Blockage of any portion this passage, from puncti down to the nasolacrimal duct, by inflammation and scarring, trauma, stone or neoplasm results in epiphora. In cases of obstruction of the nasolacrimal duct dacryocystorhinostomy (DCR) has been the standard surgical recourse. This operation is designed to drain the tears and the infected secretion from lacrimal sac into the middle meatus of the nose through an ostium in the lacrimal bone and the nasal mucosa. Toti originally described dacryocystorhinostomy (DCR) in 1904 [1]. Since then DCR surgery through an external approach has been the gold standard for the treatment of nasolacrimal duct obstruction with a success rate of over 90% [2]. Endoscopic dacryocystorhinostomy (endoscopic DCR), performed through an intranasal route was first described by McDonogh in 1989 [3]. Since then various workers [4,5]

have published their experiences with endoscopic DCR from time to time. We share our experience with external and the endoscopic DCR in a retrospective study.

Material and Methods

A retrospective study was conducted on a total of 103 cases of nasolacrimal duct obstruction treated by us. A total of 51 cases (55 sacs) treated by external DCR and 52 cases (54 sacs) treated by endoscopic DCR were included. Patients having epiphora due to chronic nasolacrimal duct obstruction resulting from chronic dacryocystitis with or without mucocoele were included in the study.

Cases of canalicular or common canalicular obstruction, lid laxity, previous lacrimal surgery, cases with suspicion of malignancy, previous radiation therapy, posttraumatic lids / bony deformity were excluded from the study. A record of complete ophthalmic and rhinological examination was considered.

External DCR: All surgeries were performed under local anaesthesia by infiltration of the area around the lacrimal sac with 2% xylocaine with adrenaline 1 in 100,000. Nasal packing was done with gauze soaked in 4% xylocaine and 1 in 100,000 adrenaline. In all the cases both the anterior and posterior lacrimal sac flaps were sutured with the nasal mucosa. The

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cases had been followed one week, two weeks, one month and after six months following the surgery.

Endoscopic DCR: All the operations were performed under local anaesthesia, where 4% xylocaine with adrenaline 1 in 100000 was used for nasal packing. Standard rigid sinus endoscope (0°) was used to identify the attachment of the anterior end of the middle turbinate. The nasal mucosa over the septum, the inferior turbinate, the middle turbinate and the area in front of the uncinate process on the affected side was infiltrated with xylocaine 2% with adrenaline using long lumbar puncture needle. To expose the bone over the lacrimal sac a rectangular mucosal flap (about 10 mm X 10 mm) was incised anterior and superior to the uncinate process using diathermy knife, to minimize bleeding. A bony ostium about the size of the mucosal window was made over the lacrimal fossa using a burr /chisel and hammer. The opening was subsequently enlarged using Citelli's punch. The medial wall of the lacrimal sac was then tented by using lacrimal probe inserted through the inferior punctum. The medial wall of the lacrimal sac so tented and visualized using 0°/30° sinus endoscope was excised using sickle knife. The opening (in the sac and the nasal mucosa) was packed with gelatin foam that was removed endoscopically in the OPD under 10% xylocaine spray anesthesia after 72 hours.

The patients in both the groups were routinely put on oral amoxicillin 500 mg 8 hourly for 5 days. In addition oral non steroidal anti inflammatory drugs (NSAIDs) were prescribed for 3-5 days. The cases were followed one week, two weeks, one month, and after six months following the surgery. Lacrimal sac syringing was done on the first postoperative visit for assessing the patency of the nasolacrimal passage.

Resolution of epiphora, absence of discharge and a patent nasolacrimal passage on irrigation were defined as a successful surgical outcome.

Results

A total of 109 lacrimal sacs of 103 patients were operated. 51 patients and 55 sacs in external DCR group, 52 patients and 54 sacs in endoscopic DCR group were included in the study. The mean age of the patients in both the groups was 30 years. Age and sex distribution is given in Table 1.

36 (33 %) of the sacs had presented with mucocoele, while eight (7.8%) cases had bilateral chronic dacryocystitis. The success rate in the external DCR group was 90.9 % (50 amongst 55 sacs) and the endoscopic DCR was 94.4 % (51 amongst 54 sacs). Majority of the recurrences (80%) in the external DCR group occurred in the first two months of surgery.

Table 1

Age and sex distribution of cases (n=103)

Age in years	External DCR (n=51)		Endoscopic DCR (n=52)		Total
	Male	Female	Male	Female	
20-40	7	16 (45.9%)	6	19 (48.1%)	46.6 %
41-60	8	20 (54.9%)	7	20 (51.9%)	53.4 %
Total	15	36	13	39	100 %

One case of recurrence was reported four months after the surgery. Four of these recurrent cases underwent revision surgery with successful outcome. One case was lost to follow-up. Revision of DCR was required in 5.6 % (3 amongst 54 sacs operated) of cases in the endoscopic group. All of them had successful outcome.

Intra operative hemorrhage was found to be the most frequent problem encountered in the external DCR group. This significantly increased the operative time. In the external DCR group, we faced difficulty in identifying the sac cavity in fibrosed and shrunken sacs. Serious complication like keloid formation was not encountered in the external DCR group.

One case complained of pain and tenderness over the incision line for about two months following the surgery in the external DCR group. Examination revealed palpable periosteal reaction over the frontal process of the maxilla in this case. The swelling and pain however resolved with oral NSAID for two weeks.

In the endoscopic DCR group difficulty was experienced in dealing with thick bone in comparatively younger individuals. In some cases gouge and hammer was required in addition to the ENT burr. In few cases of fibrosed sacs opening of sac cavity posed some problem. Serious complications like cerebrospinal fluid (CSF) rhinorrhoea was not encountered in the endoscopic group. Complications of the two groups are listed in Table 2.

Discussion

The acquired causes of nasolacrimal duct obstruction include idiopathic, involutional stenosis, naso-orbital trauma, irradiation, and infiltration by nasopharyngeal tumors [6]. In our study there was a preponderance of females over the males with 72.8% females and 27.2% males. Age distribution wise, 48 (46.6%) were between 20-40 years and 53.4% belonged to the age group between 41-60 years.

The 90.9% success rate in external DCR group compares well with that of 90 % reported in literature [2]. In the endoscopic DCR group, success rate of 94.4 % compares well with that reported by Sprekelsen et al [4] and Yigit et al [5].

Comparing these results we find that there is no statistical difference between the results of these two procedures insofar as achieving the patency of

Table 2

Complications of dacryocystorhinostomy

	External DCR	Endoscopic DCR
Intraoperative hemorrhage	5 (9.10%)	3 (5.6%)
Difficulty in identifying the sac cavity	5 (0.73 %)	4 (0.74 %)
Recurrence	5 (9.1%)	3 (5.6 %)
Scarring and keloid formation	—	—
CSF rhinorrhoea	—	—
Periosteal reaction	1 (1.8 %)	—

nasolacrimal passage is concerned. However, there are certain inherent advantages of the endoscopic DCR like excellent hemostasis, decreased postoperative pain, and swelling. In addition endoscopic procedure preserves the lacrimal pump mechanism, there is minimum distortion of medial canthal anatomy and there is no external scar.

External dacryocystorhinostomy procedure suffers from complications like hemorrhage, canalicular stenosis, and closure of anastomosis, intra operative corneal abrasion, and facial scarring in varying proportion of cases. In addition any intranasal pathology that might have caused failure of the external DCR, like adhesions, enlarged middle turbinate and septal deviation can also be addressed at the first instance during endoscopic procedure. It is possibly because of this that there is a slightly higher rate of success in the endoscopic DCR group in our series. Similarly endoscopic DCR proves a better procedure in case of closure of ostium and recurrence of NLP obstruction since this procedure can be carried out in OPD setting under lignocaine spray.

Air regurgitation was not experienced in either group in our series. Recurrence in both groups was seen in long standing cases with adhesions inside the sac. As for the difficulty in identifying the cavity of the sac in cases with adhesions between the sac walls use of injection 2 % methylcellulose, can be used effectively in inflating the sac by injecting it through the puncti.

In conclusion both external DCR and the endoscopic DCRs are effective procedure in addressing the

nasolacrimal duct obstruction. Due to certain obvious advantages discussed above endoscopic DCR might eventually replace the external approach. The bottleneck however may be the availability of expensive fibreoptic sinus endoscope and training of the ophthalmologist. The surgery of blocked nasolacrimal duct may otherwise well pass from the domain of ophthalmologist to the otolaryngologists eventually.

Conflicts of Interest

None identified

Intellectual Contribution of Authors

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