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Our Experience in Endoscopic Dacryocystorhinostomy in 203 Patients

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Abstract Treatment of Epiphora by endoscopic assistance through endonasal route is a well established procedure. However there are various choices available before the surgeon with respect to methods adopted for the procedure and also postoperative care. We like to share our experience in this regard about the procedure and also postoperative care. In our series Silicone stents and Mitomycin -C were used only in revision cases. Meticulously performed primary surgery (ie.not injuring nasl mucosa and proper exposure of lachrymal sac) saves the patient from discomfort caused by recurrence of symptoms and also cost incurred by using additional gadgets which can be reserved for failures.

Keywords Epiphora, Endoscopic DCR, Lachrymal stenting, Mitomycin- C

1. Introduction

Epiphora due to obstruction of the lachrymal drainage pathway is a common symptom. Those conditions which require Dacryocystorhinostomy (DCR) to bypass obstructed nasolachrymal duct have to be carefully selected. It is because obstructions at punctum, canalicular/saccular obstructions do not do well with DCR. External DCR was first introduced by Toti in 1904 [1] and a transnasal procedure by West in 1911 [2]. First clinical study of endoscopic endonasal DCR was published in 1989 by Dough and Mevring [3].

Endoscopic DCR is now well established procedure. The anatomic location of the sac when the sac is approached from the nasal cavity is well described [4-10]. The relevant intranasal anatomic landmarks, the middle turbinate and frontal process of the maxilla, are vitally important for the identification and exposure of the lachrymal sac and duct while performing endoscopic DCR.

2. Material and Methods

Between June 2005 and August 2014, 179 cases of primary DCRs and 24 revision DCRs (Fig.1) were performed by the same surgeon. The subjects were chosen after confirmation of obstruction of nasolachrymal duct. We adopted a simple clinical examination to do this; a) lachrymal syringing and b) presence of regurgitation of fluid (mucoid/purulent) on pressing over medial canthus (sac area). All surgeries on adult patients were performed under local anaesthesia with sedation, while paediatric subjects required general anaesthesia.

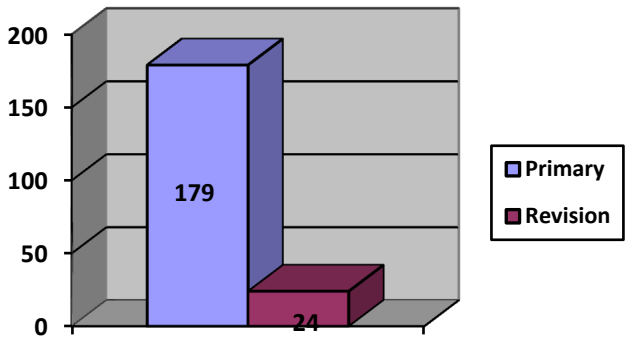

Figure 1. Distribution of patients in primary and revision DCR

SURGICAL TECHNIQUE: Nasal cavity was packed with cotton pledgets soaked in 20 ml of 4% xylocaine with 1 ml of adrenaline and squeezed well. Local anaesthetic solution of 2% xylocaine with 1:1, 00, 000 adrenaline is infiltrated around the sac near the medial canthus and in front of the anterior end of middle turbinate and uncinate process. After 10 minutes (for the anesthetic to act) a vertical incision is placed about 1 cm in front of anterior end of middle turbinate and 1 cm^2 of mucosa just in front of middle turbinate is removed using a Blakesley's forceps and bone over the lachrymal sac exposed from nasal side. Now straight and upturned Kerrison's punch forceps are used to remove the bone separating lachrymal sac from nasal cavity, by engaging them in a groove just in front of uncinate

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process and lachrymal sac is exposed. This is confirmed by seeing movement of sac on pressure over medial canthus. Then remaining bone over the sac is removed keeping in mind that upper end of lachrymal sac usually does not cross the attachment of middle turbinate to lateral nasal wall (shoulder of the middle turbinate). Punch could not be engaged in certain cases, in them bone was removed using chisel and Hammer or by drilling.

After satisfactory exposure of sac the anterior portion of it is incised with sharp sickle knife or a no.12 blade and removing the medial wall of the sac with Blakesley's forceps. At this time lachrymal syringing is done to irrigate and remove all purulent material and confirm the free passage for the tears. Nose is packed loosely with antibiotic steroid soaked ointment for about 4-6 hours, after which it is removed and topical nasal decongestants are advised and patient sent home in the evening.

All subjects were evaluated on 3rd postoperative day, followed by 1 week, 1 month and 3 months and were advised to revisit if symptoms recur. During the follow-up visits normal stoma was inspected and cleaned of any crusts and lachrymal syringing was done to confirm the patency of rhinostomy.

POSTOP CARE AND FOLLOW-UP:

Topical nasal decongestant drops were applied 4 times a day for next one week. Antibiotic steroid eye drops, one drop every 2 hours into lower conjunctiva for next two weeks. This is followed by massage over the sac area with clean fingers, from 2nd postoperative day. Any swelling that occurred around the sac area or lids was managed by cold compression with ice cubes. Oral broad spectrum antibiotic for 5 days and analgesic is given as required. On 3rd postoperative day, 1 week, 1 month and 3 months follow-up endoscopic inspection and lachrymal syringing was done. Patients were asked to report immediately if symptoms recurred.

3. Results

Out of 179 patients, who underwent endoscopic DCR for the first time, 94 were male and 85 were female. Youngest was 5yrs, and eldest was 78 years. Of this 10 had undergone bilateral DCR. Out of 24 patients, who underwent revision DCRs, 10 were from the above series and the other 14 had undergone surgeries elsewhere. Of these 14, 6 had failed External DCR and 4 had failed Endoscopic DCRs and other 4 had twice failed endoscopic DCR. Among all the patients, 24 were in the age group of 5-14 yrs.

Of the 179 DCRs on fresh cases, 147 (82%) improved after the surgery, 24 on whom revision surgery was done 21 (87.5%) were symptom free (table 1) and rest 3 were not symptom free in spite of having good flow of saline during syringing. Later, this was attributed to senile ectropion and they became symptom free 6 months later without any apparent reasons. In revision series, we used silicone stent in 2 patients and Mitomycin -C in 3 patients and it showed 100% results.

Table 1. Success rates in primary and revision DCR

	Total	Success
Primary DCR	179	147(82%)
Revision DCR	24	21(87.5%)

There was severe bleeding per-operatively in two patients with hypertension but the procedure was completed by controlling the bleeding with repeated packing with cottonoids. In two patients, there were fracture of nasal bone and frontal process of maxilla which healed without any sequelae. In one patient there was false passage in lower eye lid while probing but it healed without any sequelae. There was exposure of orbital fat in 10 patients and they had small amount of lid edema, which subsided with cold compression. Only one patient had preseptal cellulitis of the orbit that required admission and intravenous antibiotics. There were no episodes of diplopia, blindness, or nasal bleeding.

Table 2. Incidence of complications

COMPLICATIONS	NO. OF PATIENTS
Hemorrhage	2(1%)
Fracture of nasal bone and frontal process of maxilla	2(1%)
Orbital fat exposure	10(5%)
False passage in lower eye lid	1(0.5%)
Preseptal cellulitis	1(0.5%)

4. Discussion

Most studies on DCR, the results range from 85-95% [11-13] and results with external and endoscopic DCRs almost are equal. But it is very well appreciated that endoscopic DCRs have advantage in

1. It preserves pump mechanism of orbicularis oculi muscle (as this is dissected in external DCR)
2. No external scar
3. Revision is easy.

It is preferable to do endoscopic DCR after any type of earlier surgery.

In our series 82% of patients improved after first surgery and 100% of them improved with revision surgery. It is also noteworthy that we use silicone stent and Mitomycin-c local application only for revision cases. It is seen that meticulously done endoscopic DCR ie. taking care not to damage nasal mucosa and proper opening of the lachrymal sac, results are excellent and are comparable to laser DCRs and also it avoids huge amount of funds needed to be invested in sophisticated equipments and also inherent risks and complications involved with the use of laser. Lastly in view of the complications that occurred in our hands it is recommended that we should be

1. Careful in doing lachrymal syringing and probing
2. Never pull any tissue from nose side (do always sharp cuts)
3. Posterior boundary should be uncinate process, as it is very thin behind and can be easily prone to expose orbital fat.

An observation we would like to share on pediatric DCRs. In 14 DCRs which we performed under GA, on children between 5-14 yrs. of age, we found that sac can be exposed with much ease compared to adults with just 2-3 punches and also incision of sac is much easier compared to adults (as in some cases incision on fibrotic sacs is much difficult) But great caution has to be taken as structures are quite small and delicate in them.

5. Conclusions

The intranasal approach to DCR is very advantageous, as it avoids external scar. Preserves pump action of orbicularis oculi and for revision surgery by this approach is much easier and also revision in previous endoscopic DCR is easier. Use of silicone stenting or application of Mitomycin-c can be done in those cases who don't improve with first surgery. It is important that we use these methods in failures because there is some amount of scarring due to previous surgery. The second reason is that we have to be more careful when doing revision cases as the patient expectations are high and it is necessary to take steps which will prevent the chances of second failure.

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