Original Article

Problems / Complications, Success Rate – Endoscopic Dacryocystorhinostomy

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Purpose: To analyze endoscopic / endonasal dacryocystorhinostomy (endo DCR) cases regarding the problems encountered during the procedure, post operative complications, their management and success rate.

Material and Methods: Endo DCR, done from Jan 2008 to Sep 2011 in eye departments of CMH Kharian and Mardan, were analyzed in this retrospective study. In the initial ten cases, only nasal packing with 5 cc of 2 % xylocaine with adrenaline 1:100000 mixed with 0.5 cc of adrenaline 1: 1000 was done and kept for fifteen minutes. In the next ten cases, after packing, injection of the same solution (2 cc of 2 % xylocaine with adrenaline mixed with 0.5 cc of adrenaline 1: 1000) was given at the operation site (sac area and middle turbinate) and packing was done again for ten minutes. In the rest of the cases, after packing, cautery was done instead of injection. In all the procedures, silastic intubation and application of mitomycin C, 0.5 mg/ml for ten minutes was done.

Results: A total of 32 endo DCR operations were done in 31 patients (a three year boy had bilateral endo DCR) under general anesthesia. 3 were males and 28 were females. Age ranged from three years to sixty years (mean 42 ± 15). Follow up ranged from 6 to 10 months (7.5 ± 1.5). Problems arising during the operation included moderate bleeding in the nose obscuring view through the nasal endoscope during six operations (19%), difficulty in localization of sac area inside the nose in five operations (16 %), mild bleeding on first post operative day after two operations (6%) and persistent watering after five operations (16 %) which required revision. Revised cases were done with endonasal endoscopy and all improved except two.

Conclusion: Problems / complications encountered during Endo DCR can be managed and the procedure has good success rate.

During the last century, external dacryocystorhinostomy (DCR) remained a gold standard for the management of obstruction of lacrimal passages beyond the common canaliculus. Now the internal approach is also gaining popularity. Endoscopic / endonasal (Endo) DCR can be done either mechanically or with different types of lasers. Its advantages are decreased morbidity, no bleeding from skin and orbicularis, decreased post operative pain, reduced recovery time, magnified view, bright focal illumination, projection on closed circuit TV (Fig. 1) and option of recording. The different designs of nasal endoscopes include 0 degree- for looking straight, 30 degree-for angled view and 70 degree – extreme angle view. To find out the problems encountered during endo DCR operation, post operative complications, their management and the overall success rate, the following study was carried out.

MATERIAL AND METHODS

Endo DCR cases done from Jan 2008 to Sep 2011 in eye departments of CMH Kharian and Mardan were analyzed in this study. Probing and sac syringing was done in all the cases. Only cases having nasolacrimal duct obstruction underwent endo DCR. A total of 32

endo DCR were done in 31 patients (a three year boy underwent bilateral endo DCR).

Table 1. Problems encountered during the procedure and post operative complications

S. No.	Problems / complications	Operations n (%)
1	Bleeding in the nose obscuring view through endoscope	6 (19)
2	Difficulty in localization of sac area inside the nose	5 (16)
3	Mild bleeding on first post operative day	2 (6)
4	Persistent watering after operations	5 (16)

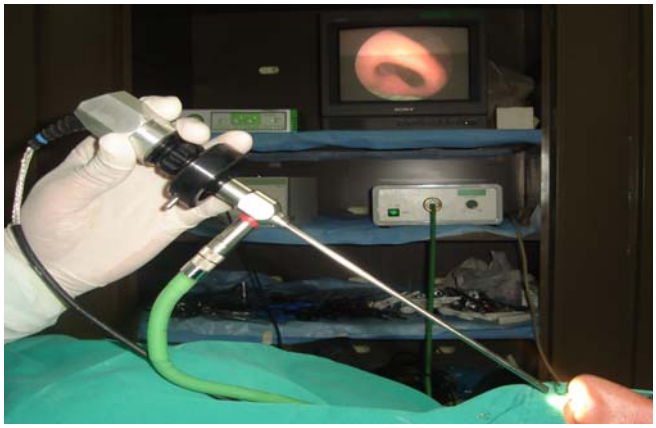

Fig. 1. Endoscope with camera and projection on monitor

Fig. 2. Endonasal DCR

Endo DCR procedure had following general steps: Packing with ribbon gauze soaked in 2% xylocaine with adrenaline 1: 100000 for ten minutes, which was followed by identification of sac area inside the nose. In the initial ten cases, localization of target site on the nasal mucosa was done by vitrectomy light pipe (20/23 G) which was passed through the punctum and canaliculi into the sac (Fig 2). The light was then visualized inside the nasal cavity where a mucosal incision was made. In 5 revision cases a probe was passed from the canaliculi to nose to identify the area. In the initial ten cases, only nasal packing with 5 cc of 2% xylocaine with adrenaline mixed with 0.5 cc of adrenaline 1: 1000 was done and kept for fifteen minutes. In the next ten cases, after packing, injection of the same solution (2 cc of 2% xylocaine with adrenaline1:100000 mixed with 0.5 cc of adrenaline 1: 1000) was given at the operation site (sac area and middle turbinate) and packing was done again for ten minutes. In the rest of the cases, after packing, cautery was done instead of the injection to achieve haemostasis. Under direct visualization, bone was removed with the ronguers / punch. An attempt was made to make a large osteotomy of more than 1.5 x 1.5 cm. bleeding at this point required packing of ribbon gauze soaked in 2% xylocaine with adrenaline 1:100000 for brief periods. In all the cases, silastic intubation was done. The DCR tube used (Eagle, USA) had fine, long and malleable probes which were easily passed through the canalicular system. In all cases, ribbon gauze was soaked in 1 ml of mitomycin C (0.5 mg/ml) and placed at the osteotomy site for ten minutes. DCR tube was removed after six months in all the cases. Success was based on subjective improvement reported by the patients.

RESULTS

A total of 32 endo DCR were done in 31 patients (a three year boy underwent bilateral endo DCR), under general anesthesia (GA). 3 were males and 28 were females. Age ranged from three years to sixty years (mean 42 ± 15). Follow up ranged from 6 to 10 months (7.5 ± 1.5). Problems arising during the operation (Table 1) included moderate bleeding in the nose obscuring view through the nasal endoscope during six operations (19%), difficulty in localization of sac area inside the nose in five operations (16%), mild bleeding on first post operative day after two operations (6%). Nasal packing for 1 day in one case and for 2 days in another case controlled post operative bleeding nose. Persistent watering after five operations (16%) required revisional operation. This gives a success rate of 84% after the first operation.

Revised cases were done with endonasal endoscopy. All improved except two and thus a success rate of 94% after the second operation was achieved.

DISCUSSION

A three year boy had bilateral nasolacrimal duct obstruction for which bilateral surgery was done, the rest of the cases were unilateral. Majority of the patients were females (90%). Though the DCR is more frequently required in females, the selection also increased this ratio in the present series. These were initial cases of endo DCR and a few males were switched to external approach. The bones in males are thick and hard. It was thought that it would be difficult to break them through the narrow nasal cavity. All of the patients completed six months follow up as all reported for DCR tube removal. After that, only those patients reported back who had persistent problem.

With the patient lying in supine position, as endoscope enters the external nares, the first thing which is visualized due to its large size is the inferior turbinate. As the tip is advanced, next structure encountered is middle turbinate. To identify the sac area in the initial ten cases, fiberoptic (vitrectomy) light pipe was passed through the canaliculi. When the tip was in the sac, transillumination could be appreciated in the nose. Later on, with more experience in identifying the landmarks of nasal anatomy, the area corresponding to the sac (anterior to middle turbinate) could be located without the help of light pipe. In revised cases, a probe was passed through the canaliculi into the nose to recognize the osteotomy site because bone had already been removed. Haemostasis control was important as even slight bleed in the nose resulted in blood on the tip of endoscope and blurring of the view. One had to remove the endoscope and clean its tip, thus increasing the operation time. In the initial ten cases, only nasal packing with 10cc of 2% xylocaine with adrenaline mixed with 0.5 cc of adrenaline 1: 10000 was done and kept for fifteen minutes but the bleeding was troublesome throughout the procedure. In the next ten cases, injection of the same solution (2cc of 2% xylocaine with adrenaline mixed with 0.5 cc of adrenaline 1: 10000) after packing, at the operation site (sac area and middle turbinate) was done and packing again for ten minutes. It resulted in increased heart rate as the absorption from nasal mucosa was very rapid. Later on, only cautery could achieve an excellent haemostasis. Chitosan – based haemostatic dressing (CBHD) has been found to decrease postoperative bleeding significantly as compared to collagen absorbable hemostat (CAH) and is safe[1].

When a camera and monitor are attached, it has a number of advantages. First the surgeon is looking at the monitor while doing surgery and can keep the posture upright. Secondly assistant knows what is being done inside the nose. Doing surgery with the endoscope only, reduces the cost but forces surgeon to keep the eye in contact with the eye piece. Ronguers / punch used in endo DCR are similar to the one used in external DCR, the only difference is that shaft and jaws are slender for passage through the narrow nasal cavity.

To prevent formation of granulation / fibrous tissue occluding rhinostomy site, Mitomycin C placed at the osteotomy site has been used in different concentrations for different durations for example 0.5 mg/ml for 10 minutes[2], 0.5 mg/ml for 5 min[3], 0.2 mg/ml for 2 min[4], 0.05% nasal pack for 48 hours[5], 0.03% with silicone intubation[6] and 0.2 mg/ml for 30 minutes[7].

Endo DCR has been done for dacryocystocoele in a 4 month old infant[8] and in adults[9,10]. It has been found to be a safe and effective procedure for the management of persistent epiphora in children (as it avoids the need for overnight admission)[11] and for adults[12]. The technique has been claimed to be appropriate for initial treatment of patients with common canalicular or even canalicular obstruction[13]. The common insertion of the upper and lower canaliculus of the lacrimal sac has been repaired with endoscopic DCR, silicone stenting and securing of stents intranasally[14]. Formation of mucosal flaps at the end of the operation has been claimed to improve success rate[15,16] and has been termed powered endonasal DCR by some while many use the term mechanical endonasal dacryocystorhinostomy (MENDCR)[17] when there is a large rhinostomy and mucosal flaps[18]. Success rates of MENDCR 92%[16], 95%[18] and 93.5%[19] were found to compare favorably with that of standard external DCR 95.8%[19]. In a few studies, success was inferior (86% endo - 94% ext)[20] with endo DCR[21] while in other studies, success rates after endo DCR have been found to be comparative (endo = ext)[13,22-25]. Best endo DCR results have been claimed by stenting or removal of the medial wall of the lacrimal sac[26]. On the other hand some are of the opinion that endo DCR should be done without intubation. They argue that surgical success rates are same whether intubation is done or not. The reported disadvantages

of intubation are granulation formation, patient discomfort, and extra cost of the silicon tube[27]. A persistent or recurrent epiphora after an external DCR can be treated by endoscopic procedure[28]. Nasal endoscopy is such a useful tool that it has been recommended essential before and even after external DCR[29].

Ophthalmologists frequently deal with the upper lacrimal system including puncta and canaliculi while otorhinolaryngologists are more familiar with the intranasal anatomy / pathology. Either of these specialists can deal with the cases after a little bit of learning but the best results are achieved when endo DCR is performed by a combined team[30]. An injection of betamethasone has been administered intraoperatively in revision endoscopic DCR, under assisted local anaesthetic, claiming high success rate (89%)[31].

To sum up, disadvantages include steep learning curve, difficulty in manipulations in the narrow nasal cavity, preferred use of general anaesthesia by many surgeons, costly equipment, difficult to form large rhinostomy (≥10mm), not possible to suture mucosal flaps, synaechiae formation in case of inadvertent extensive nasal mucosal damage and (according to a few) a lower success rate.

CONCLUSION

Problems / complications encountered during Endo DCR can be managed and the procedure has good success rate.

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