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# Endoscopic Dacrocystorhinostomy - Our Experience in Tertiary Hospital Of New Delhi

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***Abstract**: Dacryocystitis is defined as the prolonged inflammation of the lacrimal sac secondary to nasolacrimal duct obstruction .During the last century External dacryocystorhinostomy (DCR) remained a gold standard for the management of obstruction of lacrimal passages beyond common canaliculus .Endoscopic Dacrocystorhinostomyhas gained popularity as treatment option. The objective of study was to analyse the outcome of Endoscopic DCRfor patients with distal lacrimal pathway obstruction . The study was conducted over a period of 2 years withtotal 50 cases presenting with epiphora with established distal lacrimal pathway obstruction were included. The outcome of the procedure was based on relief of symptoms, safety, hospital stay, morbidity associated. Thus we find Endoscopic DCR is a well-tolerated, safe and cosmetically more acceptable procedure with low incidence of complications and a high general success rate*.

***Keywords:** Dacryocystitis, Endoscopic DCR, distal lacrimal pathway obstruction*.

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## I. Introduction

Dacryocystitis is defined as the prolonged inflammation of the lacrimal sac secondary to nasolacrimal duct obstruction.[1] The obstruction may be an idiopathic inflammatory stenosis (primary acquired nasolacrimal duct obstruction) or may be secondary to trauma, infection, inflammation, neoplasm, or mechanical obstruction.[2] Epiphora is frequent symptom of nasolacrimal duct obstruction.[3]Dacrocystorhinostomy (DCR) is surgical procedure to create drainage between the lacrimal sac and nasal cavity when the nasolacrimal duct gets blocked. Dacryocystorhinostomy can be performed as an external procedure or endonasal approach. Endonasal approach isgaining popularity, the rationale being lies in the anatomy of the lacrimal pathways about 80%of which lies in the nose, advances in endoscopes and other modern instruments of rhinology surgery.Endonasal DCR is a one stage procedure that permits correction of associated pathology such as septal deviation or chronic paranasal sinusitis, that may be a causative factor in lacrimal obstruction.[4] Although both procedures have comparable success rate, apparent advantages of endonasal DCR over external DCR are avoidance external scar on the face and preservation of pump function, short duration of surgical procedure, minimal morbidity and low complication rate.[4]Hence purpose of study was to analyse the outcome of the procedure, its safety, hospital stay, operative morbidity and cosmetic results for patients with distal lacrimal pathway obstruction .

## II. Materials And Methods

The study was conducted for a period of 2 years (Oct 2014 – Sept 2016) in Department of Otorhinolaryngology in Dr Baba Saheb Ambedkar Hospital. A total of 50 cases withcases presenting with epiphora with established distal lacrimal pathway obstruction attending Otorhinolaryngology and Ophthalmology OPD of DrBaba Saheb Ambedkar Hospital were included during in the study.Patients with obstruction at level of punctum, canaliculi or common canaliculi were excluded from the study.

Patients presenting with epiphora were subjected to a detailed ocular and systemic history according to a defined proforma. Complete head and neck examination with particular reference to the lacrimal apparatus was done. A detailed ocular examination was done by ophthalmologist. Thorough ENT examination including diagnostic nasal endoscopy was done to find out associated nasal and sinus pathology. The sites of obstruction of the nasolacrimal pathway were identified by one or more of the following tests like lacrimal sac syringing, .

After confirming the possible site of obstruction, all routine investigations were checked and then put up for endoscopic DCR surgery after taking informed consent.

All operations were done under local anaesthesia. Patient's head was tilted 15 degree upwards and turned to the right of the surgeon. 0 degree rigid nasal endoscope was introduced into the nasal cavity and whole of nasal cavity was inspected. Nasal cavity is packed with ribbon gauge packs soaked in topical 4% lignocaine

and adrenaline. The mucosa of the lateral wall infiltrated with 2ml of 2% xylocaine with 1:1,00,000 adrenaline just anterior to the uncinate process. The next step is to make the mucosal flap on the lateral wall in order to expose the lacrimal fossa bone. Using 15 number blade ,first incision is horizontal and made at 8 to 10 mm above the middle concha insertion point, starting about 3mm posterior to the insertion and moving on anteriorly until about 10mm over the frontal process of the maxilla. Following that, we make a vertical incision extending until the 2/3 of the middle concha height, stopping above the insertion of the inferior concha on the lateral wall. And, finally, we make a new horizontal incision, from the unciform apophysis until it meets the vertical incision.At this point, Kerrinson forceps is utilized for removing frontal process of the maxilla. Bone is removed as much as possible throughout the entire lacrimal fossa.The bone opening should be as large as the mucosal opening, which will enable complete visualization of the lacrimal sac . After opening the lacrimal sac longitudinally in its entire extension, two flaps are made and removed.The mucosal flap is partially resected with a cutting forceps, until it gets to the level of the posterior flap of the lacrimal sac. The upper portion of mucosal flap is repositioned over the middle concha insertion point in order to cover any portion of the remaining bone .

Postoperatively patients were given injectable antibiotics for 2 days. Then after removal of pack patients were discharged on oral antibiotics and analgesics. Antibiotics eye drops were advised 3 times for 3 days. Nasal decongestants were instilled 2 drops two times for 5 days.

Post-operative Evaluation

All patients were followed at first week, third week, third month and 6 month postoperatively. In every follow up, patients were asked using a questionnaire regarding presence or absence of discharge and about watering of eye. The patency of the lacrimal passage was investigated by sac syringing. Anterior rhinoscopy was done in each visit and looked for any crusting, granulation and secretions were removed. Data was collected from the analyzed using SPSS version 16. Association between study variables and outcome of operative procedure was calculated using statistical test like paired t- test etc.

## III. Results

Majority of the patients 22(44%) cases belonged to age group of 31-40 years . The mean age was 35.12 ± 9.1 years. Out of 50 patients, there were 40 (80%) female patients and 10 (20.0%) male patients. Male: Female ratio being 4:1.Majority of 29 (58%) patients presented with left sided symptoms.Associated nasal pathology was Deviated nasal septum which was found in 8 patients (16%), rest of them had normal nasal anatomy.Majority of patients presented with epiphora in 23(46%) patients followed by 11(22%) patients which had epiphora with discharge. 9(18%) patients had epiphora with swelling at presentation followed 7 (14%) patients presented with epiphora, swelling and discharge.Majority of the patients 33(65%) presented with chronic dacryocystitis with swelling, followed by mucocele in 10(20%) patients, followed by pyocele in 4(8%) patients. Least number of patients had fistula 3(6%) patients.In the present study 47(94%) of the patients presented to us for the first time . 3(6.0%) cases were previously operated by external DCR. All cases went uneventful expect 1 case( 2.0%) which had moderate intraoperative nasal bleeding. Table 1 shows out of 50 cases operated 2 cases (4.0%) presented post operatively with epistaxis, followed by 3 cases (6.0%) which had nasal synechiae and 15 cases (30.0%) presented with post operative crusting.

**Table 1.** Postoperative Complications

| Postoperative complications | No of pts(n) | Percentage(%) |
|---|---|---|
| **Epistaxis** | 2 | 4.0 |
| **Synechiae** | 3 | 6.0 |
| **Crusting** | 15 | 30.0 |
| **Nil** | 30 | 60.0 |
| **Total** | 50 | 100.0 |

Rest of the patients had uneventful postoperative period.Post operative syringing at the end of 1st week, 3rd week ,3rd month and 6th month.The patency of lacrimal passage was investigated by sac syringing with distilled water at 1week, 3week, 3 month, 6 month. All 50 (100%) cases were patent on lacrimal syringing at the end of 1st week. 48 cases (96.0%) were patent at the end of the 3rd week and 45 cases(90.0%) at the end of 3rd month and 6th month were found to be patent. Table 2 shows outcome of surgery ,out of 50 patients , 45 (90%) patients had complete resolution of symptoms and had patent lacrimal pathway after primary surgery at the end of 6 months. Whereas 5 cases (10.0%)had a unfavourable outcome.

**Table 2:** Outcome of surgery

| Outcome | No of patients | Percentage(%) |
|---|---|---|
| **Success** | 45 | 90.0 |
| **Failure** | 5 | 10.0 |
| **Total** | 50 | 100.0 |

All patients were discharged on postoperative day 2, except 2 cases which presented with bleeding postoperatively. The mean hospital stay was 2.2 ± 0.9 days.In this study, 5 (10%) cases had failure . Table 3 shows causes of failure in patients ,out of 5 patients with failed endoscopic DCR, 2 patients(20%) developed synechiae postoperatively .2 patients(40%) out of 5 failed DCR due to inadequate bone opening . 1 patient(20%) had shrinkage of osteotomy site , responsible for the failure of the procedure.

**Table 3.** Cause of failure

| Causes of failure | No of patients | Percentage |
|---|---|---|
| **Synechiae** | 2 | 40 |
| **Inadequate bone opening** | 2 | 40 |
| **Shrinkage of osteotomy site** | 1 | 20 |
| **Total** | 5 | 100 |

Out of the 5 failure cases, 3 underwent revision surgery and was successful. Thus success rate being 100% in revision cases and overall success rate being 96%.

## IV. Discussion

In our study majority of the patients 22(44%) belonged to the age group of 31-40 years. 4 cases (8.0%) each were found to lie in the age group of 11-20 years and 51-60 years. Range being 15-60 years. Overall mean age was 35.12 ± 9.1 years. In a comparative study done by David S et al[5] of external and endoscopic endonasal dacryocystorhinostomy found the mean age of patients who underwent external DCR was 34.4±19.2years and 41.9± 15.8 years in case of endoscopic DCR. This was in concordance with this present study. There is a declining trend towards both extremes of age in my study. This may be due to the fact that amount of lacrimal secretion is less in extremes of ages.In this present study 40(80%) patients were female, whereas 10(20%) patients were male. Female to male ratio being 4:1. In a study by David et al [5]found that 80% of patients were females which underwent surgery. The very striking predilection for females is due to narrowness of bony nasolacrimal canal and the increased angle between the bony canal and the nasal floor in females can cause tear-fluid stasis and infections to spread from the nasal cavity, and can predispose to chronic inflammation of the nasolacrimal drainage system. Other reason could be long duration of exposure to smoke in kitchen and dust.[6] In our present study majority of 29(58%)patients had left sided symptomatology. In a study done by Naisk SM et al[7] also showed maximum number of the patients had left sided symptoms. It is observed that nasolacrimal duct and lacrimal sac form a greater angle on the right side than the left, which increases the chances of the stasis and obstruction of nasolacrimal duct and lacrimal sac on left side. It is attributed as the cause for preponderance of chronic dacryocystitis on left side. Other possible explanation is, since most of the people are right handers, their left hand is free and is used for cleaning eye or mopping of tears in left eye are more.In a study done by Weidenbecher M et al[8] found septal deviation in 72% of patients, maxillary sinusitis in 32% cases , hypertrophy of turbinates in 20% patients, nasal polyposis 14% ,only 16% patients were free of any nasal pathology.In our study, associated nasal pathology was DNS which was seen in 8 patients (16%) of whom right DNS was seen in 4 (8%) and left DNS in 4 (8%) patients , but none required septoplasty as it was not obscuring the field of surgery. In the present study 1(2%) patient had moderate bleeding .The complications were more common during punching of the lacrimal bone or while making incision of the nasal mucosa .The bleeding was stopped with ribbon gauge soaked in 4% xylocaine with adrenaline. After attaining perfect haemostasis, surgery was continued.In a study done by Ayoob M et al[9] on 50 patients to ascess outcome and complications of endoscopic dacryocystorhinostomy found no intraoperative complication associated with the procedure.

In this study 15 (30%) patients had problem of crusting which was removed endoscopically and were advised for alkaline douching to prevent further crusting,3 patients(6%) developed synechiae at rhinostomy site, 2(4%) patients had postoperative bleeding which was managed conservatively .Rest of the patients had uneventful postoperative period.

Cases in which the lacrimal passage remained blocked and showed persisting ephiphora were regarded as failure. Regurgitation on pressure over lacrimal sac was positive in most of these cases.In this study, there were 5 (10%) such cases .Among the 5 patients with failed endoscopic DCR, 2 patients(20%) had moderate degree of bleeding intraoperative causing difficulty in proper visualization and crusting ,synechiae postoperatively which may caused obstruction at the site of rhinostomy and underwent revision endoscopic DCR and was successful.

Lacrimal syringing patency rates and success

In this study patients had four follow up visits scheduled at the end of 1st week , 3rd week,3rd month and 6th month .At the 1st follow up visit at 1st week all patients were found symptoms free. On syringing all patients presented with a patent tract. On nasal endoscopy found 15 patients had crusting around neoostium, which were removed endoscopically.At 2nd follow up visit at 3rd week it was found 2(4%) patients had block with clear regurgitation on lacrimal syringing. These cases had difficulty in localization of the sac intraoperatively since the lacrimal sac was placed higher up, thus the patient developed obstruction at 3rd week due to inadequate bone opening.At the end of 3rd and 6th month 5(10%) patients were found to be have block with clear regurgitation on lacrimal syringing. In this study, success rate was defined by an anatomically patent nasolacrimal system ascertained by nasolacrimal irrigation at the end of 6 months after surgery.

45 (90%) patients had successful outcome at the 6 months. The success rates are comparable with the success of studies done by Ben Simon et al[10] in patients who underwent endoscopic DCR (86 cases) had a significantly higher success rate than external DCR (90 cases), 84% versus 70% (P = 0.03).

2 patients(40%) out of 5 failed DCR had difficulty in localization of the sac intraoperatively since the lacrimal sac was placed higher up, hence the patient developed obstruction at 3rd week due to inadequate bone opening .The patient was subjected for revision endoscopic DCR and was successful.

1 patient(20%) had shrinkage of osteotomy site at 3 follow up visit, responsible for the failure of the procedure.

Out of the 5 failure cases, 3 underwent revision surgery and was successful. Thus success rate being 100% in revision cases and overall success rate being 96%.

In the study, Gupta et al[11]found that success rate endonasal DCR was 90% after a single procedure and 95% after revision procedure, which was equal to external approach, which is comparable to our study.

Our study had some limitations. The study period , sample size was small. Again as the endoscopic DCR procedures were performed by different surgeons, which may also affect the surgical outcome. This is also a limitation of our study.

Considering the high success rate, lack of external scar, low incidence of complications and minimal duration of hospital stay in our study and also in most other studies. Endoscopic DCR is a better alternative to external DCR according to patient needs and desire. Thus we find Endoscopic DCR is a well-tolerated, safe and cosmetically more acceptable procedure with low incidence of complications and a high general success rate.

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**Conflict of interest**: All authors declare that they have no conflict of interest.

**Ethical approval**: Permission to conduct the above study was obtained prior to start of study by the ethical committee of the hospital of affiliation of the authors.

**Informed consent**: Informed consent to publish the case series was taken from the patients included in the study.

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