

## Endoscopic dacryocystorhinostomy with conventional instruments: results and advantages over external dacryocystorhinostomy

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### Abstract

**Background** the aim of study is to evaluate the Endoscopic dacryocystorhinostomy (DCR) with conventional instruments, its results and advantage over external dacryocystorhinostomy (DCR).

**Methods** The study group comprised of 127 patients who underwent consecutive endoscopic dacryocystorhinostomy. The cases operated by one team were included in the study to make the uniform analysis and its result. There were 48 males and 79 female in this study and male female ratio was 1:1.6. The mean age of the patient was 37 years (range from 16 years to 58 years). There were wide variety of cases like epiphora, lacrimal sac abscess, lacrimal sac fistula, acute dacryocystitis and road vehicular accident. All the patients had undergone non-laser, non-powered conventional instruments surgery under local anesthesia. The lighted probe was not used in any case for sac identification. The free flow of saline through newly created stoma during sac syringing was considered as successful criteria. The stent was used in two cases of road vehicular accident and in remaining 125 cases no stent was used. There were 66 cases of epiphora, 30 cases of lacrimal sac abscess, 26 cases of acute dacryocystitis, 3 cases of lacrimal fistula and 2 case of road traffic

accident with multiple fractures. The average follow up period was 17 months (maximum follow up 3 years and minimum 4 months.)

**Results** The success rate was 96 %.

**Conclusion** The endoscopic DCR with conventional instruments is safe with very high success rate without any complications. It can be done in acute cases and very much suited for lacrimal sac abscess and lacrimal sac fistula.

**Keywords** Endoscopic dacryocystorhinostomy · DCR · Lacrimal sac area · Free flow of saline

### Introduction

Dacryocystorhinostomy (DCR) is a procedure to create an artificial and shorter lacrimal drainage pathway into the nasal cavity in order to reestablish the permanent drainage of a previously obstructed drainage system. The endonasal DCR approach is increasingly becoming more popular as compared to conventional external DCR approach. Endonasal approach has distinct advantage over the conventional DCR, as there is no facial scar and the lacrimal pump mechanism is also maintained [1]. It is a day care procedure<sup>(2)</sup> and patient is discharged on the same day. The endoscopic procedure became more popular in last decade due to the advancement of nasal endoscope and familiarity of ENT surgeons with endoscopic anatomy of nasal cavity.

### Material and methods

A retrospective study of 127 patients was done in the department of otorhinolaryngology at B.J. Medical College, Ahmedabad, India who had undergone endonasal DCR

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surgery in last three years. Only those cases, which were operated by one team, were included in the study to make the uniform analysis and its result. There were 48 males and 79 female in this study and male female ratio was 1:1.6. The mean age of the patient was 37 years (range from 16 years to 58 years). There were 66 cases of epiphora, which were referred from ophthalmologists, as patient did not give the consent for the facial scar for external DCR. There were 30 cases of lacrimal sac abscess, 26 cases of acute dacryocystitis. 3 cases of lacrimal fistula and 2 case of road traffic accident with multiple fractures where nose had become flat due to vehicle run over. All the cases of acute dacryocystitis were initially treated by broad spectrum antibiotics by the ophthalmologists and when it did not respond to the conservative treatment, the cases were referred to us for the endoscopic DCR surgery. The average follow up period was 17 months (maximum follow up 3 years and minimum 4 months.)

Operative procedure- the dacryocystorhinography (DCG) [1] or lacrimal scintillography [3] was not done in any case. The lacrimal sac syringe with regurgitation of fluid from the opposite puncta was the only criteria to decide the surgery. No additional endonasal procedure like septoplasty or resection of turbinate or uncinat process [1]. was required to improve access to the lacrimal sac area. There were no strict criteria for the use of 30° or 0° degree nasal endoscope. However in cases of deviated nasal septum with septum deviation towards the obstructed side, 30° degree nasal endoscope was preferred for better visualization of lacrimal sac area and endoscope was negotiated gently beyond the point of maximum deviation. All the cases were done under local anesthesia. All our patients had undergone non-laser DCR. The mucosa of lacrimal sac area was cauterized to prevent the bleeding. The maxillary line was identified. The lacrimal bone was removed with DCR punch forceps and bone removal was started from the maxillary line. Around 1–1.5 cm square area of lacrimal bone was removed. In eight cases the bone was so thick that initial bone perforation could not be done with punch forceps so cutting burr and hand piece was used. Once the small opening was made by the burr, DCR punch forceps was used to enlarge the opening. Lacrimal sac was pressed from outside and movement of medial wall of lacrimal sac through endoscopic view confirmed the identification of lacrimal sac. The medial wall of lacrimal sac was incised with tonsillar blade and opening was enlarged with true cutting forcep. The medial wall of sac was removed as much as possible. Lacrimal probe was passed from lower puncta, negotiated to come out from newly created lacrimal sac stoma. This step is essential to break any fibrous bands of nasolacrimal duct near the sac area. The sac syringing was done with normal saline. The free flow of saline from newly created stoma was considered as successful criteria for the surgery. The stent was not passed in any case except in two case of vehicular

accident. The light anterior nasal packing was done; patient was discharge in the evening after pack removal. They were given a one-week course of antibiotic and antibiotics steroid eye drops. The sac syringing was done regularly for first 2 months.

## Results

Sixty-six cases reported of epiphora and 63 patients had free flow of saline through newly created stoma during sac syringing (Table 1) and this was considered as successful criteria [3]. In two patients fibrosed lacrimal sac was found, stoma could not be created and surgery was abandoned. One patient continued to have epiphora during his four postoperative visits in first two weeks, inspite off having patent new stoma and free flow of saline during sac syringing. Patient did not turn-up for further follow-up. Six patients had recurrence of symptoms within three to six months due to granulation tissue formation at stoma. After the removal of granulation tissue, they were symptom free.

Thirty cases of lacrimal sac abscess- pus drained out after opening the medial wall of sac. Free flow of saline observed during sac syringing.

Twenty six cases of acute dacryocystitis- no recurrence of symptoms after the successful DCR surgery.

Three cases of lacrimal sac fistula -Once the lacrimal sac stoma was created and light antibiotic sterile dressing was applied over the skin at the fistula site over the period of time, it healed in due course of time.

Two cases of road traffic accident-No natural lacrimal drainage was found. An artificial drainage was created inside the nose and stent was passed. One patient developed infection and pus formation after 4 weeks, stent was removed and patient continued to have epiphora. Patient was advised to come again for repeat surgery once infection subsides and fracture heels up, but patient never reported back. In another patient, stent was kept for six weeks, after the stent removal, tract collapsed and there was no passage of saline into nasal cavity.

**Table 1** Results and success rate.

	No. of cases N = 127	Results (Free flow of saline = 122)
Epiphora	66	63
Lacrimal sac abscess	30	30
Acute dacryocystitis	26	26
Lacrimal sac fistula	03	03
Road vehicular accident	02	00
Success rate		96 %

## Discussion

The residual epiphora and no passage upon irrigation has been reported to be about 13% [4] but in our study we did not encounter single case of 'no passage upon irrigation'. However in case of lacrimal sac abscess there was no pus drainage after making the stoma and only after passing the lacrimal probe from puncta to stoma, pus drained out and afterwards free flow of saline observed during sac syringing. That made the authors to believe that there are always some fibrous bands at nasolacrimal duct opening nears the sac which must be broken-down for free passage. In case of lacrimal sac fistula, initially saline did not pass from the newly created stoma rather it flowed from the fistulous opening as path of least resistance. However after closing the fistulous opening by digital pressure the free flow of saline was observed. In road traffic accident, the flow of saline passage was established after the surgery but it was never free flowing. The result of endoscopic DCR with history of facial trauma has already been reported with surgery failure<sup>(5)</sup>. The silicone tube as stent was used in these two cases for the epithelisation of the tract however one patient developed infection and in other patient, the tract collapsed after the stent removal and saline did not pass. The silicone tube stenting was not used in any other case in this series. The other study also suggests that DCR without stenting offers the same success rates for primary surgery [6]. The complication like secondary canalicular stenosis, sump syndrome, distal stenosis, adhesion between the ostium and septum [4] was not seen. The lighted probe was not used in any case for the sac identification like other [4]. Although there are reports of successful DCR with powered instrument [3] and laser DCR [7] but all the cases underwent non powered and non-laser DCR. The success rate of endonasal DCR has been reported to be very high and as good as external DCR [8, 9]. Our success rate is as high as 96%.

## Conclusion

Endoscopic DCR with conventional instrument is safe. It has very high success rate without any complications. It can be done in acute cases and very much suited for lacrimal sac abscess and lacrimal sac fistula.

## Summary

With the advent of powered instrument to remove the lacrimal bone, laser to make a clean stoma on the lacrimal sac mucosa and lighted probe to identify the lacrimal sac area, all these things add cost to the surgery and to the patient, however the conventional instrument is still very effective for endonasal DCR. The endonasal DCR is as good as external DCR and it can also be done in acute cases.

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