

External versus Endoscopic Dacryocystorhinostomy for Acquired Nasolacrimal Duct Obstruction: A Comparative Study

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Abstract

Purpose: The purpose of this study was to compare the success rates of endoscopic endonasal dacryocystorhinostomy (DCR) and external DCR in cases of acquired nasolacrimal duct obstruction.

Design: This was a prospective randomized clinical study.

Methods: A total of 58 consecutive patients were selected for DCR surgery. Among these, 30 patients underwent endonasal DCR and 28 patients underwent external DCR. Surgical success was defined by patients' resolution of symptoms along with a patent lacrimal drainage system. Failure was defined as a lack of symptomatic reduction in epiphora and/or inability to irrigate lacrimal drainage system post-operatively.

Results: Mean age of the patients was 38.64 years (34 ± 10.8 years). 81% of the study subjects were female and 19% were male. The success rate of endonasal DCR was 93.33% compared to a success rate of 92.85% in cases of external DCR ($P = 0.898$). Complication rate was low in both the groups.

Conclusion: Endonasal DCR surgery is an attractive alternative to external DCR surgery with the advantages of a shorter operative time, lack of cosmetic scar, and equivalent success rate.

Key words: Endonasal dacryocystorhinostomy, External dacryocystorhinostomy, Nasolacrimal duct obstruction

INTRODUCTION

Dacryocystorhinostomy (DCR) operation is the standard procedure to treat nasolacrimal duct obstruction. The surgery creates a lacrimal drainage pathway into the nasal cavity. Although external DCR is regarded as "gold standard,"^[1] endoscopic DCR is rapidly evolving as an effective alternative. While external DCR involves a standardized technique, endonasal DCR can be carried out in several ways - with or without the endoscope, with the help of various types of instruments such as rongeur,^[2]

drill,^[3] chisel, and various types of lasers.^[4] The purpose of our study was to compare the success rate of external DCR and endonasal DCR over a 6-month follow-up period.

MATERIALS AND METHODS

In this prospective study, 58 eyes of 58 patients were randomized to external DCR and endonasal DCR. External DCR was done in 28 eyes, while 30 patients were subjected to endonasal DCR. Preoperatively, a detailed ophthalmic and ENT examination was done to rule out any other coexisting nasal pathology. Nasolacrimal duct obstruction was confirmed preoperatively by syringing. People with a history of past failed DCR, cases with suspicion of sac malignancy, canalicular, or common canalicular obstruction and those with bony deformity of lacrimal fossa (post-traumatic), were excluded from the study. In external DCR, the area around lacrimal sac was infiltrated with local anesthetic (2% xylocaine

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with 1:100,000 adrenaline). Following exposure, anterior and posterior flaps of lacrimal sac were sutured to the nasal mucosa. In endonasal DCR, nasal packing was done with a gauge soaked in 4% xylocaine with 1:100,000 adrenaline. A standard rigid endoscope was used to identify the anterior end of the middle turbinate. A rectangular mucosal flap (10 mm × 10 mm) was incised anterior and superior to the uncinata process. Then, a bony ostium was made over the lacrimal fossa using hammer and chisel. An opening was made in the lacrimal sac. The openings were packed with gelatin foam. Postoperatively, the patients were put on oral antibiotics and nonsteroidal anti-inflammatory drugs. All the patients were followed for a 6-month period - at 1st week, 2nd week, 3rd week, 6th week, 3rd month, and 6th month. Patency was tested during the follow-up visits by syringing.

RESULTS

Of 58 patients, 11 (18.96%) were male and 47 (81.03%) were female [Table 1 and Figure 1]. In this prospective study, a total of 58 eyes of 58 patients were included in the study. 30 eyes underwent endoscopic DCR and 28 eyes underwent external DCR. Mean age of the patients was 38.64 years (34 ± 10.8 years). 81% of the study population was female and 19% was male. The right eye was found to be involved in 65% of the cases. Most of the patients presented with persistent watering, followed by mucopurulent regurgitation, mucocele, and lacrimal fistula [Table 2 and Figure 2].

Patient data were analyzed using independent samples *t*-test. At the end of 6-month follow-up period, 28 of

30 patients in the endonasal DCR group had a successful outcome (93.33%) compared to 26 of 22 patients in the external DCR group (92.85%). The difference was not statistically significant (*P* = 0.898). The mean duration of endonasal DCR was 45 min (±5.67 min) compared to 75 min (±7.76 min) in cases of external DCR, which was statistically significant (*P* = 0.001). Two of the patients of external DCR had post-operative bleeding from nose on the 1st post-operative day which resolved with nasal packing for 48 h. During the 6-month follow-up, one patient of external DCR group had hypertrophic scar and two had ostium closure [Table 3 and Figure 3a]. In the endonasal

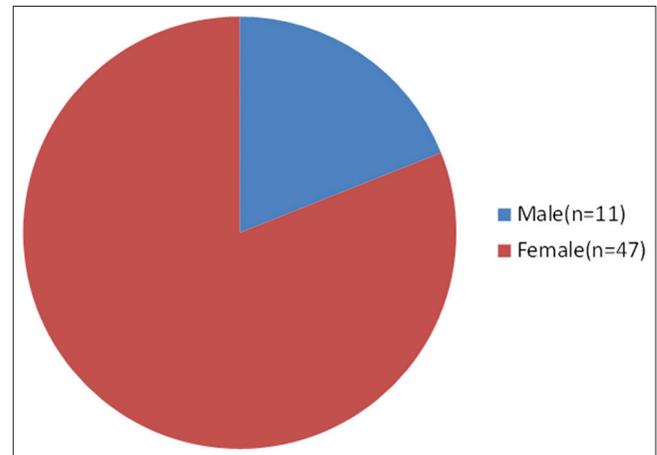


Figure 1: Sex distribution of the patients

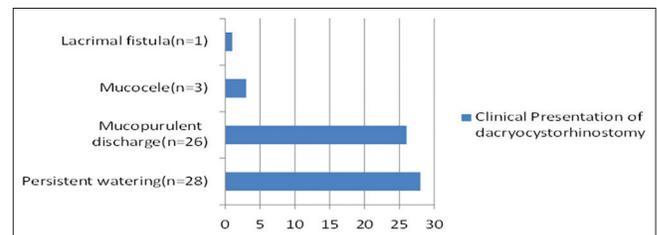


Figure 2: Clinical presentation of the patients suffering from dacryocystorhinostomy

Table 1: Sex distribution of the patient

Male	Female
11	47

Table 2: Clinical presentation of dacryocystorhinostomy

Persistent watering (%)	28 (48.28)
Mucopurulent discharge (%)	26 (44.23)
Mucocele (%)	3 (05.17)
Lacrimal fistula (%)	1 (1.72)

Table 3: Complication of external versus endonasal DCR

External DCR group (%)	
1. Ostium closure	- 2 (7.14)
2. Hypertrophic scar	- 1 (3.57)
Endonasal DCR group (%)	
1. Nasal synechia	- 2 (6.67)
2. Granulation of ostium	- 2 (6.67)

DCR: Dacryocystorhinostomy

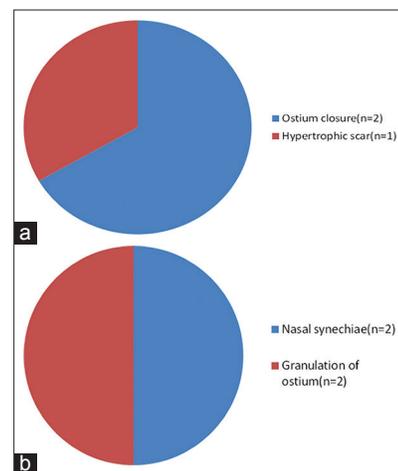


Figure 3: (a) Complication of external dacryocystorhinostomy (DCR). (b) Complication of endonasal DCR

DCR group, two patients had synechiae and two had granulation of the ostium [Table 3 and Figure 3b].

DISCUSSION

Several studies have compared external DCR with endonasal DCR showing variable success rate ranging from 63% to 97%.^[5-10] Khan *et al.*^[11] showed that success rate was 73.3% with endoscopic approach compared to 80% with external approach. Tsirbas *et al.*,^[12] in his study, had compared external DCR to mechanical endonasal DCR during a follow-up period of around 1 year. Both had similar success rates (93.5% in mechanical endonasal DCR and 95.8% in external DCR. $P = 0.06$). In our study, the mean duration of endonasal DCR was 45 min compared to 75 min in cases of external DCR. This was similar to the study by Hartikainen *et al.*^[13] where the average duration of endonasal DCR and external DCR was 38 min and 78 min, respectively. Endoscopic DCR offers the advantage of the absence of skin incision, thus preserving the pump mechanism of orbicularis oculi muscle.^[14] Besides, there is less of intraoperative bleeding. Furthermore, one can identify and/or treat any nasal or paranasal sinus pathology at the same time.^[15] Patient satisfaction is better in endonasal DCR due to faster rehabilitation. However, the drawbacks include high cost of the instruments, steep learning curve for the surgeons, and inadequate exposure of the lacrimal system, especially in cases of suspected malignancy. External DCR, on the other hand, offers advantage of adequate exposure of the surgical area and ability to obtain lacrimal sac biopsy.

CONCLUSION

Although external DCR is still considered the “gold standard,” endoscopic DCR is a rapidly evolving procedure with comparable success rates. Besides, the shorter operating time, less intraoperative bleeding, and lack of

cutaneous scar provide better patient satisfaction making endonasal DCR an attractive alternative to external DCR.

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