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Case Report

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# Merits of endonasal endoscopic dacryocystorhinostomy: a case series

**T. Dinesh Singh[1], Jyothi Ramakrishna[2], Sara Shreen[3], Nazima Begum[4], Sandeep K. Vishwakarma[4], Aleem A. Khan[4]**

[1]Department of ENT, Ontario Human Rights Commission, Deccan College of Medical Sciences, Kanchanbagh, Hyderabad, Telangana, India, [2]Department of ENT, Durgabai Deshmukh Hospital, Vidyanagar, Hyderabad, Telangana, India, [3]Department of Pharmacy, Teegala Krishna Reddy College of Pharmacy, Meerpet, Hyderabad, Telangana, India, [4]Department of Stem Cell Research & TRanslational Medicine, CLRD, Deccan College of Medical Sciences, Hyderabad, Telangana, India

**Address for correspondence:**
Aleem A. Khan, CLRD, Deccan College of Medical Sciences, Hyderabad, Telangana, India.
E-mail: aleem_a_khan@rediffmail.com

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## ABSTRACT

Dacryocystography produces an image of the lacrimal sac and nasolacrimal duct (NLD) and is especially helpful in patients with suspected anatomic abnormalities like (a) congenital anomalies such as lacrimal sac diverticula and (b) patients who have had prior trauma (or) surgical procedures. Initial conservative dilation of the NLD having failed, the ophthalmologists were left with no option but to perform the conventional dacryocystorhinostomy (DCR), which requires an external incision resulting in a facial scar and is a long and fairly complicated procedure, requiring the use of operating microscope or loupes. DCR) is a surgical procedure done to drain the lacrimal sac in instances of intrasaccular and postsacular obstruction. Endonasal endoscopic DCR is now being performed as a primary procedure or for revision of failed cases of external this year. In this study, the efficacy of this procedure as a day case procedure and results of patients undergoing surgery with the 3 month follow-up are assessed. The study comprises the analysis of 20 patients of epiphora or chronic dacryocystitis who underwent endonasal endoscopic DCR within a period of 1 year. Based on the results, we concluded that endoscopic DCR is a simple, safe and minimally invasive procedure as it is a direct approach to the sac. It can be performed as a day case procedure under local anesthesia and excellent results. There is no need of routine systemic uncinectomy in all cases. Cosmetically, it is acceptable as there is no external scar.

KEY WORDS: Endoscopes, lacrimal apparatus disease, operative, surgical procedure, treatment outcome

## INTRODUCTION

Dacryocystorhinostomy (DCR) is a surgical procedure done to drain the lacrimal sac in instances of intra-saccular and post-sacular obstruction. Dacryocystography produces an image of the lacrimal sac and nasolacrimal duct (NLD) and is especially helpful in patients with suspected anatomic abnormalities like [1-3].
(a) Congenital anomalies such as lacrimal sac diverticula
(b) Patients who have had prior trauma (or) surgical procedures [4].

These studies require injecting a radio-opaque dye with a fine catheter into the canaliculus. Caldwell, lateral and anteriposterior view, provide useful images. Digital subtraction technique may be useful [1,5,6]. Initial conservative dilation of the NLD having failed, the ophthalmologists were left with no option but to perform the conventional DCR, which requires an external incision resulting in a facial scar and is a long and fairly complicated procedure, requiring the use of operating microscope or loupes.

Caldwell first described endonasal DCR in 1893 [7]. However, this did not gain popularity because of difficult visualization. McDonough and Meiring first described endoscopic trans-nasal DCR in 1989. Once performed only from an external approach, the advent of rigid endoscopes with endoscopic instrumentation has made endonasal approach a reality. During a routine functional endoscopic sinus surgery operation, the NLD was inadvertently exposed. This started a train of thought to apply it to the advantage of patients with NLD obstruction. The operation is a conservative and direct

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one, which is easily learned by an ENT surgeon. It is far less traumatic than external approach as there is no facial scar, no disruption of medial palpebral ligaments or the angular facial vessels and no significant complication. Endonasal endoscopic DCR is now being performed as a primary procedure or for revision of failed cases of external this year. In this study, the efficacy of this procedure as a day case procedure and results of patients undergoing surgery with the 3 month follow-up are assessed.

## CASE REPORT

Patients attending ENT department of Government General Hospital, Gulbarga and Basaveshwar Teaching and General Hospital attached to Mahadevappa Rampure Medical College, Gulbarga have formed the materials for the study of merits of endonasal endoscopic DCR.

### Inclusion Criteria

All patients attending outpatient department (OPD) with recurrent epiphora or dacryocystitis and have been diagnosed to have NLD block.

### Exclusion Criteria

Patients who were below 15 years of age and patients who had uncontrolled hypertension and diabetes mellitus.

The study comprises the analysis of 20 patients of epiphora or chronic dacryocystitis who underwent endonasal endoscopic DCR within a period of 1 year from March 2004 to February 2005. In this study, the efficacy of this procedure as a day case surgery and results of patients undergoing surgery with the 3 months follow-up are assessed. The patients are selected by simple random method.

Once the patient presented to OPD with recurrent epiphora or dacryocystitis, the patients are admitted, and history and findings were recorded in a specifically constructed proforma.

1. Detailed history of the patient was taken
2. General examination is done
3. Local examination is done to:
   a) Exclude any lacrimal pump and blink reflex failures.
   b) Complete ophthalmological evaluation to rule out any other cause of epiphora.
   c) Anterior and posterior rhinoscopy to see any nasal pathology which was causing epiphora.
4. Investigations like:
   (a) Routine blood and urine examination.
   (b) Test to check the patency of NLD and common duct.
   (c) X-ray PNS is done.
   (d) Diagnostic nasal endoscopy is done.
   (e) Dacryocystorhinography is done wherever necessary

All the patients are assessed by the department of ophthalmology as having distal obstruction of the nasolacrimal sac or duct and had been referred for endoscopic DCR. Lacrimal obstruction had been confirmed by syringing via the lacrimal puncta, supplemented by dacryocystography where the sight of obstruction was not clear. Other causes of watering eye were excluded. No attempt was made by ENT surgeons to assess the patients as requiring endoscopic DCR.

Otorhinolaryngological assessment included endoscopy of the nose to clarify that the maxillary line was accessible and that the lateral wall of the nose was normal. Any patient taking aspirin was asked to discontinue medication 10 days prior to surgery.

The intention was to carry out the surgery as a day case procedure; the patients are offered local anesthesia with the option of a general anesthesia if they preferred.

- Detailed discussion with the patients.
- All the cases are operated under local anesthesia except one, where the patient is not cooperative for local anesthesia.
- The patients are followed for a period of up to 3 months for complications and recurrence.
- The parameters used are-age, sex, sides, results, length of hospital stay, and complications.
- Statistical test used Chi-square test.
- Duration of study-1 year.

## RESULTS

Most of the patients are in 20-40 years of age group N-11 (55%) [Table 1, Figure 1a] and it is more common in females 70% than males 30% [Table 2, Figure 1b]. Most of the cases presented with disease on the left side (70%) [Table 3, Figure 1c]. Common mode of presentation is chronic dacryocystitis 75%. Others were mucocele in 20% and pyocele 5%. About 60% cases were

**Table 1: Age incidence (most of the patients were in 20-40 years of age group. The youngest being 22, and the oldest were 60 years old)**

| Age (years) | Number of patients | Percentage |
|---|---|---|
| 21-30 | 07 | 35 |
| 31-40 | 04 | 20 |
| 41-50 | 01 | 5 |
| 51-60 | 08 | 40 |
| Total | 20 | 100 |

**Table 2: Gender-wise prevalence (Females are more commonly affected than males)**

| Sex | Number of patients | Percentage |
|---|---|---|
| Male | 06 | 30 |
| Female | 14 | 70 |
| Total | 20 | 100 |

**Table 3: Side incidences. Most of the cases presented with disease on the left side**

| Side | Number of patients | Percentage |
|---|---|---|
| Right | 06 | 30 |
| Left | 14 | 70 |
| Total | 20 | 100 |

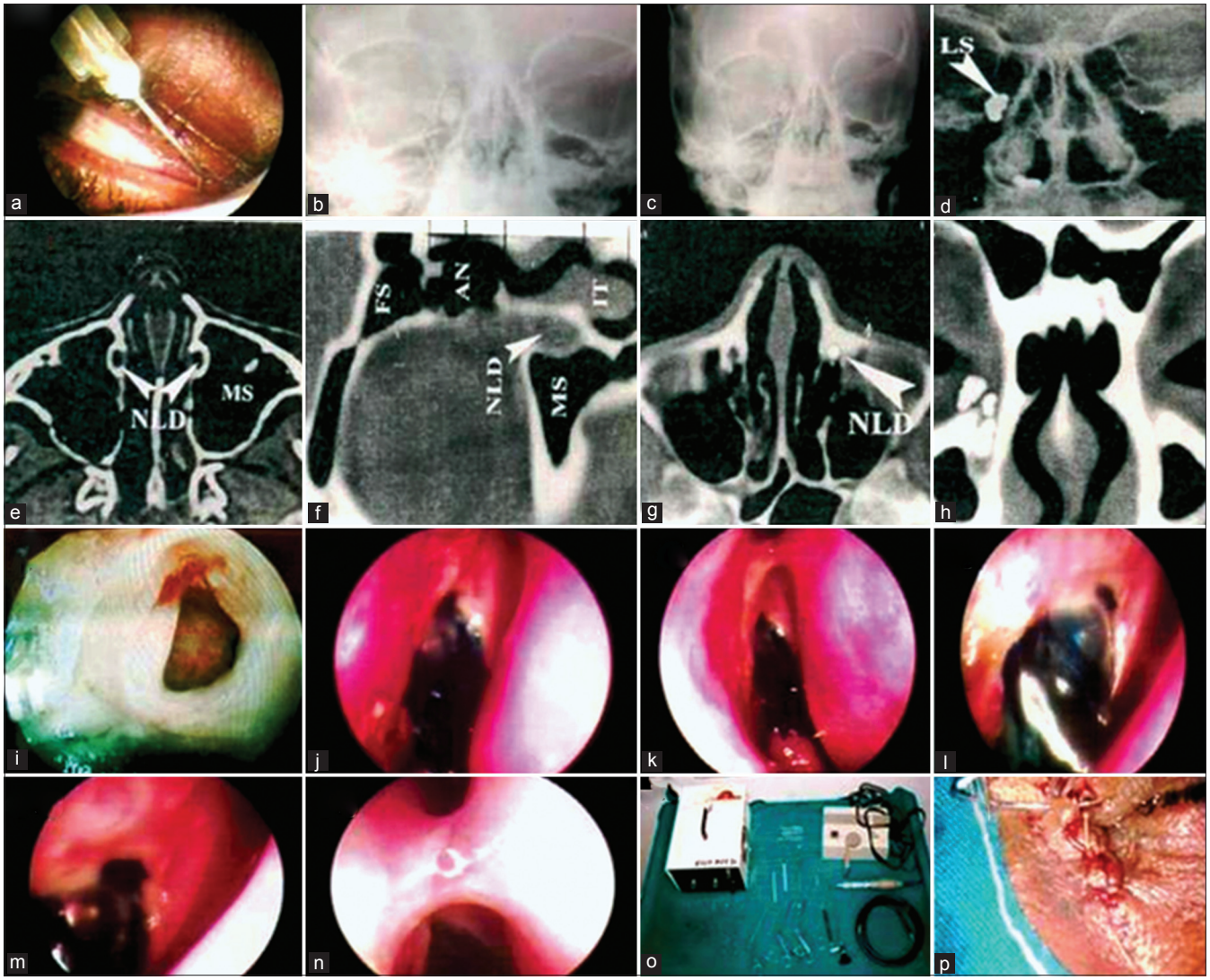


**Figure 1:** (a) Picture of syringing, (b,c) Dacryocystogram showing blocked NLD with dye in sac, (d) Dacryocystogram showing dye in the sac and nasal cavity, (e) CT showing NLD, (f) CT showing patent NLD on both sides (g) CT showing blocked NLD on one side (h) CT showing dye in the sac and NLD [i] Rhinostome at one week post-operative (j-m) Dye seen coming from the rhinostome 3 months post-operative (n) Syncchiac seen (o) Equipment used (p) External dacryocystorhinostomy post-operative showing the suture line

idiopathic, and the rest of cases had various pathologies. Other associated pathologies were deviated nasal septum in 3 cases, agger injury. In these cases, various operative steps are found to be more difficult, and it took more time and few needed nasal packing for 24 h.

In cases of mucocele and pyocele endoscopic DCR was found easier than simple dacryocystitis because of dilated sac causing the thinning of bone of lacrimal fossa, making exposure of the sac easier. Incision and excision of the mucosa of sac were also found easier in these cases.

The average time required is 30-45 min in plain endoscopic DCR. At 3 months follow-up, there is symptomatic cure in 19 patients (95%), all of whom reported dry, comfortable eye [Table 4 and 5]. Studies with end DCR without stent for the duration of 6-15 h were significantly high in both males and females whereas in 16-25 h females were completely dominant on males [Table 6]. The procedure is unsuccessful in one patient (5%) [Table 7, Figure 1]. During the period of follow-up, endoscopic examination revealed the size of rhinostome in

**Table 4: Procedures described in various studies supporting the data of our present study**

| Author | Procedure | Result % |
|---|---|---|
| Heikki (1994) [8] | Endonasal $CO_2$- laser DCR | 83 |
| Zhou (1996) [9] | End DCR with stent | 93.70 |
| Young and Hardman (1998) [10] | Inferior End-DCR with stent | 90 |
| Sprekelson (1996) [11] | End-DCR | 96 |
| Maier and Schmidt (2000) [12] | End-DCR with stent | 90 |
| Hesham (2001) [13] | Endoscopic guided trephination | 83 |
| Bambule and Chamero (2001) [14] | End-DCR with stent | 91.7 |
| Bruno, *et al.* (2002) [15] | End DCR with stent | 86 |
| Wormald, *et al.* (2002) [16] | Powered End DCR with stent | 95.7 |
| Mortimore, *et al.* (1999) [17] | End DCR without stent | 87 |
| Present study (2005) | End DCR without stent | 95 |

DCR: Dacryocystorhinostomy

Table 5: Success rate of the procedure

| Follow-up | Number | Percentage |
|---|---|---|
| At 3 months | 19/20 | 95 |

Table 6: Studies with end DCR without stent

| Duration | Male | Female | Total |
|---|---|---|---|
| 6-15 h | 06 | 07 | 13 |
| 16-24 h | 00 | 07 | 07 |
| Total | 06 | 14 | 20 |

DCR: Dacryocystorhinostomy

Table 7: Complications

| Complications | Number | Percentage |
|---|---|---|
| Synechiae | 08 | 40 |
| Swelling of the eye | 03 | 15 |
| Failure of surgery | 01 | 05 |
| Total | 12 | 60 |

1 week was 4-5 mm, and then it gradually reduced to 2 mm by end of 3 months. It is also observed that the site of rhinostome is more important.

## DISCUSSION

Totally, 20 cases of epiphora and chronic dacryocystitis are subjected to endoscopic DCR at Government General Hospital and Basaveshwar Teaching and General Hospital attached to Mahadevappa Rampur Medical College, Gulbarga from March 2004 to February 2005.

It is found to be more common in the age group of 20-40 years (55%) for both sexes, probably due to decreased lacrimation in extremes of age. Females are more commonly affected (79%), and it is thought to be due to bad personal habits, long duration of exposure to smoke in the kitchen and dusty environments. Left side is more affected than the right side (70%) because on the left side it is observed that the NLD and lacrimal sac from the greater angle which increase the stasis and obstruction. Other explanation is that most of the people are right handed; hence, the right hand is free and is used for cleaning the eye or mopping the tears that increases the chance of infection in left eye.

It is minimally invasive surgery as it is the direct approach to the lacrimal sac, and no other structure is to be dissected. Bleeding stops almost always at the end of the procedure requiring packing for only a few hours. As it is a day case surgery, it can be performed in elderly patients and patients medically unfit, who are contraindicated for external DCR. It can be performed in cases of pyocele and atrophic rhinitis which are again contraindicated for external DCR.

Our results (95%) are better than those who used silicone stents and sophisticated instruments. We did not perform uncinectomy in all the cases as the uncinate marks the posterior limit of the dissection after which we may encounter complications, we found that a rhinostome placed posteroinferiorly was better than rhinostome placed anterosuperiorly as it preserved the lacrimal pump action which is important for tearing. We also found that a size of 1.50 mm rhinostome was enough to drain the tears. All our patients are discharged within 24 h after the operation, as the bleeding stops almost always after the surgery, and a few require packing.

Mild complications such as synechiae formation and swelling of the eye are seen which are managed appropriately after antibiotic and anti-inflammatory drugs, eye massage, and local ice pack application.

## CONCLUSION

Based on available data and from literature, we conclude that endoscopic DCR:

- Is a simple and safe procedure.
- It is a minimally invasive procedure as it is a direct approach to the sac.
- It can be performed as a day case procedure under local anesthesia and excellent results.
- It widens the scope of surgery in elderly and medically unfit patients.
- Can also be done in cases presenting with pyocele and atrophic rhinitis.
- There is no need of routine systemic uncinectomy in all cases
- In cases where concomitant ESS is required, endoscopic DRC should be done as a first step.
- Use of sophisticated instrument like dacryoendoscope, laser, microdebrider is not necessary.
- Routine use of lacrimal stent is not advocated.
- Cosmetically, it is acceptable as there is no external scar.

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