

## A comparative study of external dacryocystorhinostomy versus endoscopic endonasal dacryocystorhinostomy without stenting

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### Abstract

**Introduction:** Dacryocystitis is a condition in which there is inflammation of the lacrimal sac due to stagnation of the sac contents, as a result of stricture of the nasolacrimal duct arising from chronic inflammation, usually of nasal origin (which is much more common) or due to congenital blockage in the nasolacrimal duct. **Materials and methods:** Retrospective, comparative, randomized interventional study was conducted in the Department of Ophthalmology, Maheshwara Medical College and hospital, Chitkul (V), Near Isnapur X Roads, Patancheru(M), Sangareddy Dist, Telangana, India collaboration with Department of ENT from January 2020 to December 2020. The patients attending the Tertiary care centre fulfilling the inclusion and exclusion criteria were taken up as case. **Results:** In group A patients, tearing of the anterior nasal flap was seen in 2 cases, and punctum laceration in 1 case. In group B patients, 1 cases had bleeding, 3 cases had Trauma to the middle turbinate, while accidental entry into anterior ethmoidal cells was in 4 cases. In 6 cases, there was difficulty in making a bone window. In group A patients, the duration of surgery is comparatively more than in Group B. In the postoperative period, group A patients had epistaxis, rhinostomy site closure, hypertrophied external scar, and medial canthi damage as its complication, while group B epistaxis, nasal Synechea, intranasal granulation at the ostium are major complication. After a period of 3 months by syringing the lacrimal sac of the patients in Group A patients, 18 patients had a patent sac (success rate is 90%). In group B patients, 16 patients had a patent sac (success rate being 80%). **Conclusion:** DCR, either by external or endonasal route, can be considered for treatment of nasolacrimal duct obstruction. The external route has an easy and short learning curve with reduced cost of equipment. Whereas endoscopic DCR is time-saving, avoids a facial scar and injury to the neighboring structures like the medial palpebral ligament and the angular facial vessels. In our study, the success rates of Endonasal DCR and External DCR are almost equal and comparable. This indicates that these two different DCR techniques are acceptable alternatives. However, it's the preference of the patient, the resource available, and the surgeon himself to decide the right surgical option to axe the disease.

**Key Words:** Dacryocystitis, epistaxis, rhinostomy, nasolacrimal duct obstruction

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### Introduction

Dacryocystitis is a condition in which there is inflammation of the lacrimal sac due to stagnation of the sac contents, as a result of stricture of the nasolacrimal duct arising from chronic inflammation, usually of nasal origin (which is much more common) or due to congenital blockage in the nasolacrimal duct. Various factors responsible for the stasis of tears in the lacrimal sac are as follows:

a. Anatomical factors, which retard drainage of a tear include comparatively narrow bony canal, partial canalization of membranous nasolacrimal duct, or excessive membranous folds in it[1-3]. b. Obstruction of the lower end of the NLD by nasal disease, such as inferior turbinate hypertrophy, marked deviated nasal septum, polyps, tumors, and atrophic rhinitis causing stenosis may, also cause stagnation of tears in the lacrimal sac. c. Mild grade inflammation of lacrimal sac due to associated recurrent conjunctivitis may block the NLD.

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The code of Hammurabi around 2250 BC made the first documented reference to the surgical treatment of a lacrimal fistula or a lacrimal abscess. Toti1, who published an article in 1904 describing a surgical treatment of dacryocystitis, made the major contribution to external Dacryocystorhinostomy (DCR). Transnasal DCR was first described in 1889 by Killian. Caldwell[2] (1893) too described the intranasal DCR technique involving partial inferior turbinate resection to expose the nasolacrimal duct. It was modified later by West,[3] in 1911 and Halle,[4] in 1914 using a microscope for visualization. However, the microscopic approach did not gain popularity mainly due to difficulties in visualizing the intranasal anatomy. With the development of rigid nasal endoscopes, the otorhinolaryngologist now has a well-illuminated and magnified view of the nasal cavity. This has facilitated the intranasal surgical approach and has allowed more controlled access and manipulation of the lacrimal sac[4,5].

### Materials and methods

A retrospective, comparative, randomized interventional study was conducted in the Department of Ophthalmology, Maheshwara Medical College and hospital, Chitkul (V), Near Isnapur X Roads, Patancheru(M), Sangareddy Dist, Telangana, India collaboration with the Department of ENT from January 2020 to December 2020. The patients attending the Tertiary care centre, fulfilling the inclusion and exclusion criteria, were taken up as case. The study included 40

cases that were diagnosed with primary acquired nasolacrimal duct obstruction or chronic dacryocystitis. The observations of the patients are shown in table I, II, III. They were randomized into two groups. Group A included 20 patients who underwent external Dacryocystorhinostomy and group B included the rest of the 20 patients who underwent endoscopic endonasal Dacryocystorhinostomy. All symptomatic cases of epiphora, which were diagnosed for primary acquired nasolacrimal duct obstruction or chronic dacryocystitis and willing to undergo surgery, are taken up as cases. Patients were excluded if tearing was due to canalicular and punctual Obstruction or lower eyelid laxity or Ectropion or entropion. Surgery, external or endoscopically performed, was done by a team of Ophthalmic and ENT Surgeons. Each patient was subjected to detailed history taking followed by ocular and adnexal exam as per a predesigned Performa. The Ocular examination was done by an ophthalmologist. The eyelids were examined for Ectropion, entropion, and lid laxity. Examination of the function for their normal location and size were evaluated. Any medial canthal swelling was noted. Nasolacrimal duct obstruction was diagnosed by

the regurgitation of fluid into the conjunctival sac by applying pressure over the lacrimal sac area (Regurgitation test). Lacrimal sac syringing was done to confirm the diagnosis. An ENT surgeon conducted a thorough anterior rhinoscopy and any abnormalities like atrophic rhinitis, deviated nasal septum, polyposis, and hypertrophied turbinates were noted. Preoperative investigations included a complete haemogram, blood sugar, bleeding and clotting time, X Ray Para nasal sinus – water's view etc. All patients had preoperative counseling, and both the procedures were explained in detail with their advantages and disadvantages.

**Results**

The present study involved 40 cases. They were divided into two groups of 20 each. Group A underwent external DCR, and Group B underwent endoscopic endonasal DCR. In group A patients who underwent external DCR, 1 case, there was inability to get a proper nasal flap and the sac flap was sutured to periosteum.. Tearing of the anterior nasal flap was seen in 2 cases, while in 1 case there was laceration of the punctum. All the complications were managed intraoperatively.

**Table 1: Showing Age Distribution**

S.No	Age in years (5 to 50 years)	No. of cases Ex DCR	No. of cases En DCR
1	1-20	3	6
2	21-30	7	8
3	31-40	6	4
4	41-50	4	2
	Total	20	20

**Table 2: Gender Distribution**

S.No	Group	Male	Female	Total
1	Ex DCR	3	17	20
2	En DCR	2	18	20
3	Total	5	35	40

**Table 3: Clinical Picture of Chronic dacryocystitis**

SL. No.	Clinical picture	No. of cases
1	Persistent watering	18
2	Mucopurulent regurgitation	15
3	Swelling in sac area (mucocele)	6
4	Lacrimal fistula	1

In group B those who underwent endoscopic endonasal DCR patients 1 case had moderate bleeding requiring bipolar cauterization, Trauma to the middle turbinate was seen in 3 cases while in 4 cases there was accidental entry into anterior ethmoidal cells. In 6 cases there was difficulty in making a bone window.

**Table 4: Time consumed in both group of patients**

Duration of surgery	Group A patients		Group B patients	
	No's	%	No's	%
< 30 MIN	02	10%	05	25%
30-60 MIN	10	50%	14	70%
60-90 MIN	08	40%	01	05%

**Table 5: Postoperative complications in Group A patients**

S.No	Complications	No Of Cases	Percentage
1	Epistaxis	01	05%
2	Wound infection/ gaping	00	00%
3	Hypertrophied external scar	01	05%
4	Closure of osteum	01	05%

**Table 6: Postoperative complications in Group B patients**

S.No	Complications	No Of Cases	Percentage
1	Epistaxis	01	05%
2	Nasal Synechea	05	25%
3	Granulation	01	05%
4	Obstruction at rhinostomy site	01	05%
5	Epistaxis	01	05%
6	Lacrimal sump Syndrome	01	0.5%

**Table 7: Comparison of outcomes in both group of patients**

GRADING	Syringing	EXT DCR	ENDO DCR
1	Patent	18(90%)	16(80%)
2	Partial block with fluid regurgitation	01(05%)	01(05%)
3	Complete block	01(05%)	03(15%)

### Discussion

Nasolacrimal duct obstruction can be approached either externally by transcutaneous route or by endonasal approach by the fiberoptic endoscope. A lot of Comparative studies were conducted in relation to the two approaches. In our study, it has been seen that the majority of the patients were female. The male–female ratio being 1:7 that was grouped into two groups. The female preponderance is in accordance to the literature. In our study most of the patients were young aged and belonged to the 3rd decades of life followed by 4th decade. The patients presented with persistent watering, Mucopurulent regurgitation, Swelling in sac area (mucocele), Lacrimal fistula, which are usually the classical presentation of patients with dacryocystitis as described in the literature. In group A patients, who underwent external DCR, inability to get a proper nasal flap necessitated suturing the sac flap to periosteum. Tearing of the anterior nasal flap and laceration of the punctum during surgery were also reported during operation. All the complications were managed intraoperatively. Bruising, Wound infection, Cerebrospinal fluid leaking, Punctal eversion, Medial Canthal damage, Inadvertent incision of the periorbital which are known complications of external DCR mentioned in various studies, has not been reported in our study[6]. In group B, who underwent endoscopic endonasal DCR, bleeding was the most common complication encountered during surgery. Adequate hemostasis was achieved intraoperatively by cauterization / anterior nasal packing. Trauma to the middle turbinate, accidental entry into anterior ethmoidal cells, and difficulty in making a bone window are the complications encountered and managed intraoperatively. In group A patients, those who underwent external DCR duration of surgery is comparatively more than in group B those underwent endoscopic endonasal DCR patients. 14 cases of endoscopic endonasal DCR patients need an average time of 35 min while 10 cases of external DCR required an average time of 50 min for each surgery. Endoscopic endonasal DCR proved to be a landmark in nasolacrimal surgeries, providing a paradigm of advantages. The most important being the preservation of the physiological pump system. The medial canthi ligament remains intact. Thereby, it maintains the contour of the inner aspect of the eye. A Minimal blood loss during surgery alleviates the unnecessary hazards of blood transfusion in the postoperative period. The young patient was exempted from any ugly facial scar in the postoperative periods. It is easy and less painful. A comparatively lesser operative time is required than for the conventional external DCR. The patient gets early ambulation, thereby reducing the hospital stay. If there is blockage or narrowing of ostium that has been detected in the postoperative check-up, it can be dealt with as an OPD procedure. It allows some common intranasal causes of External DCR failure to deal with concomitantly like DNS, nasal polyp, hypertrophied middle turbinate, etc. On either side, Endoscopic endonasal DCR needs sophisticated instruments to deal with. Thorough knowledge of the intranasal anatomy is a must for an Ophthalmologist to start with this procedure which usually requires a longer learning curve. In this

regard, studies have suggested that external DCR helps in good anatomic identification of the sac and mucosal lining, whereas the inside of the sac is not always visible in endoscopic surgery, thus making external DCR a much successful surgery than the endonasal approach[7-10]

### Conclusion

DCR, either by external or endonasal route, can be considered for treatment of nasolacrimal duct obstruction. The external route has an easy and short learning curve with reduced cost of equipment. Whereas endoscopic DCR is time-saving, avoids a facial scar and injury to the neighboring structures like the medial palpebral ligament and the angular facial vessels. In our study, the success rates of Endonasal DCR and External DCR are almost equal and comparable. This indicates that these two different DCR techniques are acceptable alternatives. However, it's the preference of the patient, the resource available, and the surgeon himself to decide the right surgical option to axe the disease.

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