

# External versus Endonasal Dacryocystorhinostomy: A Comparative Study

Rajeev Reddy<sup>1</sup>, Prajwalli Reddy<sup>2</sup>

<sup>1</sup>Associate Professor, Department of ENT, KBN Medical College, Kalaburagi, Karnataka, India, <sup>2</sup>Assistant Professor, Department of Ophthalmology, MR Medical College, Kalaburagi, Karnataka, India

## Abstract

**Introduction:** In past years, external dacryocystorhinostomy has been considered the gold standard in terms of functional outcome for treatment for nasolacrimal duct obstruction. In comparison, interest in the use of the recently developed endonasal dacryocystorhinostomy procedure has been rekindled because of advances in instrumentation.

**Materials and Methods:** This clinical study was conducted at the Department of ENT, KBN Medical College and Department of Ophthalmology, MR Medical College, Kalaburagi during the period between June 2015 and November 2015.

**Results:** A total of 50 patients were included in the study which were respectively selected by the authors for the procedure. 30 patients (60%) underwent external dacryocystorhinostomy and the remaining 20 (40%) underwent endonasal dacryocystorhinostomy.

**Conclusion:** However, there is not much to compare between the two approaches as far as a primary surgery is concerned in terms of success rate as both of them give equally good results in good hands.

**Key words:** Dacryocystorhinostomy, Endonasal endoscopy, Epiphora, Nasolacrimal duct obstruction

## INTRODUCTION

Nasolacrimal duct obstruction inhibits the flow of tears from the eye to the nose, leading to symptoms of epiphora. The clinical spectrum of epiphora ranges from the occasional trickle to chronically irritating overflow of tears. Epiphora results from a disruption in the balance between tear production and drainage.<sup>1</sup>

The usual causes of stenosis of the nasolacrimal drainage system include chronic or acute inflammation, trauma, and congenital malformations.<sup>2-4</sup> Tears form the conjunctival sac pass through the lacrimal puncta in the upper and lower lids to the upper and lower lacrimal canaliculi and then to the common canaliculi to empty into the lacrimal sac located in the lacrimal fossa. From the lacrimal sac, tears pass to the nasolacrimal duct along the lateral wall of the nose into the inferior meatus.

Females are affected more than males, probably due to smaller anatomical dimensions of the nasolacrimal system in the former. This nasolacrimal duct obstruction was typically treated using external dacryocystorhinostomy (DCR). Also with the advent of nasal endoscopy, the endonasal approach has also become a good treatment option. A review is made here from the literature as well as personal experience on the possible outcomes and complications of these surgical techniques and is discussed and compared.

## Patient Selection and Evaluation

Patients with a history of epiphora, dacryocystitis, or both should be treated through a standard clinical workup that includes the documentation of the tearstrip level, examination of the eyelids for punctual malpositioning, compression over the lacrimal sac to observe mucoid or purulent reflux and irrigation through the canaliculi to document the patency of the lacrimal outflow tracts, along with examination of the nasal cavity.<sup>5,6</sup> Obstructions observed with on syringing and probing, or lacrimal scintigraphy are used for the diagnosis of nasolacrimal duct obstruction.<sup>7</sup> Lacrimal scintigraphy is a physiological test<sup>7,8</sup> that is likely to yield abnormal results in patients with functional nasolacrimal duct obstruction.

Access this article online



www.ijss-sn.com

**Month of Submission :** 09-2016  
**Month of Peer Review :** 10-2016  
**Month of Acceptance :** 10-2016  
**Month of Publishing :** 11-2016

**Corresponding Author:** Dr. Prajwalli Reddy, Professor, Department of Ophthalmology, MR Medical College, Kalaburagi, Karnataka, India.  
E-mail: prajwalli\_reddy@yahoo.com

**Treatment**

DCR involves the creation of an alternative route for the drainage of tears between the lacrimal sac and nasal cavity, bypassing the nasolacrimal duct. This can be achieved either by an external approach or through the nasal cavity using an endoscope (endonasal approach).

**External DCR**

A small incision made 1 cm from the medial canthus to reduce the risk of scars and avoid the angular vessels. The periosteum at the anterior lacrimal crest is incised, and subsequently, the lacrimal fossa is entered (Figure 1). The lacrimal and maxillary bones are removed using Kerrison Rongeurs to create a large rhinostomy.<sup>9</sup> The lacrimal sac and nasal mucosa are opened longitudinally, the sac contents are examined, and a silicon stent is routinely inserted and tied loosely to prevent cheese wiring of the canaliculi.

**Endoscopic Endonasal DCR**

A 0-degree nasal endoscope is used to visualize the anatomy of the lacrimal area just anterior to the middle turbinate in the lateral wall of the nose. The mucosa elevated from the lacrimal bone (Figure 2). Kerrison punch is used to remove the lacrimal bone to identify the nasolacrimal duct which is followed superiorly to the sac. Then the sac is incised and contents evacuated.<sup>10-14</sup> Silicon stents can be placed from the punctum into the nasal cavity to maintain the patency.

**MATERIALS AND METHODS**

This clinical study was conducted at the Department of ENT, KBN Medical College and Department of Ophthalmology, MR Medical College, Kalaburagi between June 2015 and November 2015. The standard protocol as mentioned above to diagnose and select patients for surgery was followed including syringing of the sac. The fitness for surgery was established for all the patients. The external approach was done by the ophthalmologist at MR Medical College and the endoscopic approach by the ENT surgeon at KBN Institute of Medical Sciences. The age groups of the patients ranged from 10 years to 70 years. Of the patients female: male ratio was found to be 4:1.

**RESULTS**

A total of 50 patients were included in the study which were respectively selected by the authors for the procedure. 30 patients (60%) underwent external dacryocystorhinostomy, and the remaining 20 (40%) underwent endonasal dacryocystorhinostomy. The results were evaluated for 6 months depending on the symptom improvement and patients' quality of life.

The aim of the study was to compare the outcomes and complications involving both groups.



Figure 1: Exposure in external DCR



Figure 2: Endonasal exposure and removal of Lacrimal bone

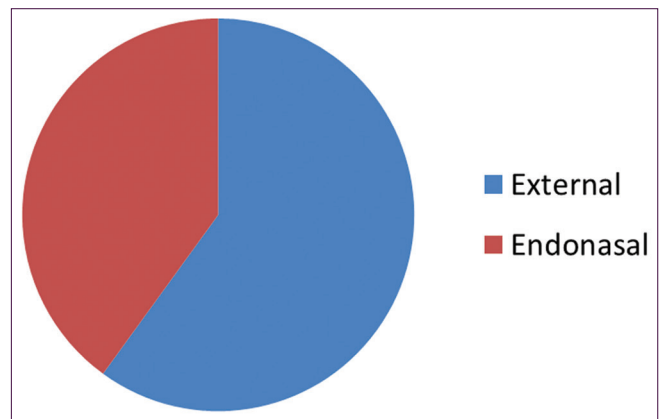


Figure 3: Comparison of the study groups in volume

Of the 30 patients who underwent an external DCR, 2 patients (6.6%) had troublesome intraoperative bleed, 4 patients (13.33%) had a recurrence of epiphora suggesting a stenosis of the ostomy, 1 patient (3%) had a bad scar formation. The remaining patients (76%) had a good improvement in terms of symptom-free life.

**Table 1: Comparison of the incidence and frequency of complications in both external and Endonasal DCR**

Procedure	Complications		
External DCR (n=30)	Bleeding (6.6%)	Recurrence of epiphora (13.33%)	Scar (3%)
Endoscopic DCR (n=20)	Difficult sac localization (25%)	Recurrence of epiphora (10%)	Synechiae (5%)

In the next group who underwent an endonasal approach, 5 patients (25%) had a high location of the sac which resulted in poor visualization. 2 patients (10%) had recurrence of symptoms in form of epiphora, and another 1 patient (5%) had nasal obstruction postoperatively as a result of synechiae (Table 1).

## DISCUSSION

The advantages of external DCR include high predictability and the direct visualization of the anatomy. The technique also facilitates accurate anastomosis between the lacrimal sac and nasal mucosa. However, external DCR has some disadvantages, including facial scarring, lacrimal pump dysfunction resulting from the interruption of medial canthal anatomy and the orbicularis oculi muscles, and limitations in acute dacryocystitis patients with abscess formation.<sup>15</sup>

An endoscopic approach reduces the risk of interfering with the medial canthal tendon and lacrimal pump physiology. This approach also reduces scarring, which is cosmetically important for certain patient groups, particularly young individuals.<sup>16</sup> This also has a shorter postoperative recovery time and reduced rates of postoperative complications. Endoscopic endonasal DCR plays an established role in revision DCR surgery. In the case of cicatricial obstruction at the osteotomy site, it is easier to perform endoscopic revision, and the patient is more likely to accept such a revision without visible external cuts.

Compared with external DCR, endoscopic DCR is more expensive, with high equipment costs. Endoscopic DCR is also technically more difficult to learn, and there is a definite learning curve.<sup>17,18</sup>

## CONCLUSION

There is not much to compare between the two approaches as far as a primary surgery is concerned in terms of success rate as both of them give equally good results in good hands.

## REFERENCES

- Cheung LM, Francis IC, Stapleton F. Symptom assessment in patients with functional and primary acquired nasolacrimal duct obstruction before and after successful dacryocystorhinostomy: A prospective study. *Br Ophthalmol* 2007;91:1671-4.
- Duggal P, Chakravorty S, Azad RK, Mohan C. An epidemiological study on patients undergoing dacryocystorhinostomy. *Indian J Otolaryngol Head Neck Surg* 2006;58:349-51.
- Berlucchi M, Tomenzoli D, Trimarchi M, Lombardi D, Battaglia G, Nicolai P. Dacryocystocele in the adult: Etiology, diagnosis and treatment. *Acta Otorhinolaryngol Ital* 2001;21:100-4.
- Piane R, Romano L, Nuti D, Romano F, Passali D. Endonasal dacryocystorhinostomy: A personal experience. *Acta Otorhinolaryngol Ital* 1999;19:255-9.
- Dolman PJ. Comparison of external dacryocystorhinostomy with nonlaser endonasal dacryocystorhinostomy. *Ophthalmology* 2003;110:78-84.
- Presutti L. Endonasal dacryocystorhinostomy. *Acta Otorhinolaryngol Ital* 1995;15:449-53.
- Karim R, Ghabrial R, Lynch T, Tang B. A comparison of external and endoscopic endonasal dacryocystorhinostomy for acquired nasolacrimal duct obstruction. *Clin Ophthalmol* 2011;5:979-89.
- Deviprasad D, Mahesh SG, Pujary K, Pillai S, Mallick SA, Jain V. Endonasal endoscopic dacryocystorhinostomy: Our experience. *Indian J Otolaryngol Head Neck Surg* 2009;61:223-6.
- Zaidi FH, Symanski S, Olver JM. A clinical trial of endoscopic vs external dacryocystorhinostomy for partial nasolacrimal duct obstruction. *Eye (Lond)* 2011;25:1219-24.
- Saroj G, Rashmi G. Conventional dacryocystorhinostomy versus endonasal dacryocystorhinostomy-a comparative study. *Indian J Otolaryngol Head Neck Surg* 2010;62:296-8.
- Türkcü FM, Oner V, Tas M, Alakus F, Iscan Y. Anastomosis of both posterior and anterior flaps or only anterior flaps in external dacryocystorhinostomy. *Orbit* 2012;31:383-5.
- Shun-Shin GA, Thurairajan G. External dacryocystorhinostomy – An end of an era? *Br J Ophthalmol* 1997;81:716-7.
- Linberg JV, Anderson RL, Bumsted RM, Barreras R. Study of intranasal ostium external dacryocystorhinostomy. *Arch Ophthalmol* 1982;100:1758-62.
- Feng YF, Yu JG, Shi JL, Huang JH, Sun YL, Zhao YE. A meta-analysis of primary external dacryocystorhinostomy with and without mitomycin C. *Ophthalmic Epidemiol* 2012;19:364-70.
- Kao SC, Liao CL, Tseng JH, Chen MS, Hou PK. Dacryocystorhinostomy with intraoperative mitomycin C. *Ophthalmology* 1997;104:86-91.
- Caldwell GW. Two new operations for obstruction of the nasal duct, with preservation of the canaliculi and an incidental description of a new lacrimal probe. *NY Med J* 1893;57:581-2.
- Sinha V, Gupta D, Prajapati B, More Y, Khandelwal P, Singh SN, *et al.* Endoscopic dacryocystorhinostomy with conventional instruments: Results and advantages over external dacryocystorhinostomy. *Indian J Otolaryngol Head Neck Surg* 2008;60:207-9.
- Puxeddu R, Nicolai P, Bielamowicz S, Serra A, Puxeddu P. Endoscopic revision of failed external dacryocystorhinostomy. *Acta Otorhinolaryngol Ital* 2000;20:1-5.

**How to cite this article:** Reddy R, Reddy P. External versus Endonasal Dacryocystorhinostomy: A Comparative Study. *Int J Sci Stud* 2016;4(8):35-37.

**Source of Support:** Nil, **Conflict of Interest:** None declared.