

**ENDOSCOPIC DCR VERSUS EXTERNAL DCR**

Rukma Bhandary<sup>1</sup>, Ajay A. Kudva<sup>2</sup>, Deepalakshmi Tanthry<sup>3</sup>, Devan P. P<sup>4</sup>, Mahesh S. G<sup>5</sup>, Sowmya<sup>6</sup>, Sudhir Hegde K<sup>7</sup>

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**ABSTRACT: PURPOSE:** To compare success rates of endoscopic dacryocystorhinostomy (DCR) and external DCR for acquired nasolacrimal duct obstruction (NLDO). **MATERIALS AND METHODS:** A prospective comparative non randomized study of 64 patients who presented with acquired NLD obstruction to a tertiary hospital. They were fully evaluated to ascertain the site of obstruction and patients with distal obstruction were included in the study. 34 patients underwent endoscopic DCR and 30 patients underwent external DCR **RESULTS:** 64 patients were included in the study and 72 procedures carried out. Success was achieved in 65 cases and failure in 7. Of the 7 failed cases, anatomical obstruction at the fistula site was found in 3, whereas functional failure was found in 4. In our patients, endoscopic DCR had a significantly higher success rate than external DCR, 95.23% versus 83.33% (P = 0.03). **CONCLUSIONS:** The success rate of Endoscopic DCR for acquired NLDO in our group of patients was 95.23%, with endoscopic surgery showing better results.

**KEYWORDS:** Chronic Dacryocystitis, Nasolacrimal Duct Obstruction (NLDO), Endoscopic dacryocystorhinostomy, External dacryocystorhinostomy.

**INTRODUCTION:** The surgery of dacryocystorhinostomy (DCR) is over 100 years old.<sup>1</sup> Cladwell.<sup>2</sup> described the first intranasal approach at the start of the last century and around the same time Toti.<sup>1</sup> reported the external approach. Mc Donough and Meiring.<sup>3</sup> described the first endoscopic endonasal DCR in 1989 and since then gained popularity among otorhinolaryngologist trained in endoscopic surgeries. The endonasal endoscopic approach is come of age due to its advantages which include preservation of the lacrimal pump function, decreased operative time and avoidance of a cutaneous scar. The main problems of endoscopic technique are long term patency and osteotomy closure due to granulation tissue.<sup>4</sup> Massaro et al.<sup>5</sup> in 1990 was the first to introduce laser intranasally using the microscope for visualization. In 1991 Gonnering et al,<sup>6</sup> used the endoscope and laser in combination and referred the surgery as endoscopically laser assisted lacrimal surgery.

**MATERIALS AND METHODS:** A prospective randomized study was conducted at our tertiary hospital on patients diagnosed with nasolacrimal duct obstruction or lacrimal sac disease between May 2012 and November 2013 for 18months. A total of 64 patients were included in the study among which 30 were in the external DCR group in the Department of Ophthalmology and 34 were in the Endoscopic DCR group in the Department of Otorhinolaryngology. Diagnosis was done on the basis of clinical examination like regurgitation test and syringing and sometimes dacryocystography was done. Patients with canicular block or higher obstruction were excluded from the study. There were 26 males and 38 females among the 64 patients. There were 8 patients who had bilateral disease and were in the endoscopic group. So total of 72 procedures were carried out on the 64 patients.

Surgical technique for endoscopic DCR: Endoscopic DCR is performed under general anesthesia or local anaesthesia. The patient is placed in a supine position with the head elevated 15

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degrees. After shrinkage of the nasal mucosa with packing gauze soaked in a mixture of 1:200,000 epinephrine and 4% lidocaine, the mucosa surrounding the lacrimal sac is infiltrated with the 2% lidocaine with 1:100000 adrenaline. A 4 mm diameter, zero or thirty degree endoscope is used. Using a sickle knife, a vertical mucosal incision is made 8 mm anterior from the attachment of uncinata process at the lateral nasal wall and it is extended from just above the anterior attachment of the middle turbinate to the attachment of the inferior turbinate. The mucosal flap is elevated backwards off the maxillary bone and removed with cutting forceps. Bone covering the lacrimal sac is then gently removed with rongeurs or diamond DCR burr until the sac is widely exposed to the level of the fundus.

It is important to remove all bone covering the common canalicular opening. A metallic lacrimal probe is passed through inferior canaliculi and gently pushed medially to tent the lumen of the sac and to facilitate the incision on the sac. A horizontal incision then is made with a keratome on the inferior border of the exposed sac wall. After identifying the lumen, a vertical incision is made with a keratome and extended to the fundus of the sac. An anteriorly based lacrimal sac flap is created, everted and adjusted to accurately oppose the nasal mucosa. A small gel foam patch soaked in antibiotic solution is packed lightly in the exposed sac to keep the flap in position throughout the initial healing period. Light nasal packing is required unless there has been associated nasal surgery. Each patient is postoperatively prescribed oral antibiotics, nasal steroid spray and ophthalmic drops, and is followed regularly. Nasal irrigation with saline is performed to prevent crust formation.

Surgical technique for External DCR: The surgery can be done under general anesthesia or local anesthesia. The latter is the most commonly employed modality. Local anesthesia is given by both infiltration as well as topical application. For infiltration 2% lignocaine with adrenaline is used. A drop of topical proparacaine is placed in conjunctival cul de sac for intraoperative comfort. Nasal mucosa is sprayed with 10% lignocaine 1-2 puffs followed by packing with 4% lignocaine and 0.5% xylometazoline. The incision is curvilinear incision of about 10-12 mm in length, 3-4 mm from the medial canthus along the anterior lacrimal crest. Blunt dissection is carried on to reach the periosteum. A Freer's elevator is used to separate the periosteum from the bone and reflect it laterally along with the lacrimal sac to expose the lacrimal fossa. All efforts should be made to preserve the medial canthal tendon and dissected only when needed. Once the lacrimal fossa is exposed, bone punching should be started at the junction of lamina papyracea of the ethmoid and lacrimal bone.

The Kerrison bone punch should be gently inserted between the bone and the nasal mucosa and the ostium sequentially enlarged. The first step is to create sac flaps. To do this, a Bowman's probe is passed through the lower punctum and bent in such a way to tent the sac as posterior as possible to create a large anterior and small posterior flap. Using the probe as guide, an "H"-shaped incision is made with the help of a number 11 or 15 blade right across the sac from the fundus to the nasolacrimal duct. Flaps are raised and the posterior one is cut. The second step is to fashion nasal mucosal flaps. With the help of number 11 blade incisions are made in the nasal mucosa along the bony ostium except anteriorly to have a hinged flap. The large anterior flap is raised and the posterior small residual flap is cut. It is important to oppose nasal mucosal and sac flap edge to edge.

Excess nasal mucosa can be excised in a controlled manner. Once flaps are secured, the orbicularis is sutured back with 6-0 vicryl followed by skin with 6-0 silk.

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The patients were discharged on the second postoperative day. The patients were followed up after one week, one month and six months after the surgery for enquiring about their symptom relief and to do a nasal endoscopy to visualize the rhinostomy and for syringing. We defined a successful outcome as a marked improvement in preoperative epiphora, a patent neo-ostium on nasal endoscopic examination and a free flow on syringing. Statistical analysis was conducted between the two groups and p value less than 0.05 was considered significant.

**RESULTS:** Of the 64 cases 26 were male (40.62%) and 38 were female (59.37%) patients. The youngest patient included in this study was 18 year old girl and the eldest was 56 year old man. Of these 64 patients, 8 patients had bilateral disease and were included in the endoscopic group. There were 30 patients in the external DCR group among the 64, and 34 patients in the endoscopic DCR group. Among the 34 patients 8 had bilateral disease and so 42 procedures were performed totally. Patient had symptoms of epiphora which was the most common symptom, followed by mucopurulent discharge from the eye. Among the 64 patients, 63 patients underwent primary DCR and there was one patient who had undergone external DCR previously was included in the endoscopic group. Patients in both the groups were followed up for 6 months to 1 year.

Success rate was evaluated based on endoscopic visualization of the rhinostomy, free flow on syringing and symptomatic improvement. Overall success rate of the procedure was (5 failures out of 30) 83.33% for the external DCR group and (2 failures out of 42) 95.23% for the endoscopic DCR group. Of the 5 failures among the external DCR group rhinostomy was not visualized endoscopically. Among the 2 failures in the endoscopic group, 1 had granulation at the rhinostomy site and the other had a wide rhinostomy but the pump mechanism was not functioning owing to his previous history of external DCR and therefore had intermittent epiphora. The other case of granulation at the rhinostomy site had excessive bleeding intraoperatively. A statistical analysis between the success rate of the 2 groups revealed p value as 0.03 which was considered as statistically significant.

**DISCUSSION:** DCR is the treatment of choice for chronic dacryocystitis and it can be performed via the external or endoscopic approach. Endonasal endoscopic DCR has well known advantages over the standard external DCR like it avoids facial scarring, division of the medial canthal ligament and disruption of the pump action of the lacrimal sac. It has minimum morbidity and less risk of intraoperative bleeding. It also enables direct access to the rhinostoma site, reducing tissue damage.<sup>7</sup> It can also be performed during acute dacryocystitis as it has a shorter operating time and easy access route.<sup>8</sup> Simultaneous nasal and paranasal sinus pathologies can be treated in the same sitting. Regular evaluation and care of the operative site is possible with the help of endoscope.<sup>9</sup>

Our study included patients above 18 years, with female preponderance of 59.37% which is similar to other studies like Sudip Kr Das et al.<sup>9</sup> Chronic dacryocystitis has been observed to be more common in women of low socioeconomic group due to poor hygiene, exposure to smoke and dust. Use of cosmetics on eyes also increases the chances of transmission of infection.<sup>10,12</sup>

Our study reveals that endoscopic DCR results are better than external DCR (95.23% compared to 83.33%) while studies like Sudip Kr Das et al have similar results to external DCR.<sup>9</sup>

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**AUTHORS:**

1. Rukma Bhandary
2. Ajay A. Kudva
3. Deepalakshmi Tanthry
4. Devan P. P.
5. Mahesh S. G.
6. Sowmya
7. Sudhir Hegde K.

**PARTICULARS OF CONTRIBUTORS:**

1. Assistant Professor, Department of Otorhinolaryngology, AJIMS & RC, Mangalore.
2. Associate Professor, Department of Ophthalmology, AJIMS & RC, Mangalore.
3. Assistant Professor, Department of Otorhinolaryngology, AJIMS & RC, Mangalore.
4. Professor & HOD, Department of Otorhinolaryngology, AJIMS & RC, Mangalore.

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5. Associate Professor, Department of Otorhinolaryngology, AJIMS & RC, Mangalore.
6. Senior Resident, Department of Otorhinolaryngology, AJIMS & RC, Mangalore.
7. Professor & HOD, Department of Ophthalmology, AJIMS & RC, Mangalore.

**NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Rukma Bhandary,  
Assistant Professor,  
Department of Otorhinolaryngology,  
A. J. Institute of Medical Sciences &  
Research Centre, Kuntikana, Mangalore.  
E-mail: rukmabhandary99@yahoo.com

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