



**ORIGINAL RESEARCH PAPER**

**ENT**

**ENDOSCOPIC DACRYOCYSTORHINOSTOMY WITH STENTING – OUR EXPERIENCE IN A TERTIARY CARE CENTER**

**KEY WORDS:** Nasolacrimal Duct, Dacryocystorhinostomy, Silicone Stenting, Trans-Nasal, Lacrimal Drainage System

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**ABSTRACT**

**Background:** The dacryocystorhinostomy (DCR) is a surgery aiming in formation of fistula of the lacrimal sac into nasal cavity. It is the preferred method of therapy for nasolacrimal duct blockage distally. Ophthalmologists and ENT surgeons both perform it. The development of surgery that increases surgical effectiveness is silicone stenting. **Materials And Method:** Between 2013 and 2022, 50 patients underwent surgery in Department of ENT, Sapthagiri Institute of Medical Science and Research, Bangalore. To arrive at a clinical diagnosis, a complete physical examination and a thorough history were performed. Endoscopic Dacryocystorhinostomy with silicone stenting was performed as the primary form of treatment. **Conclusions:** In individuals with nasolacrimal duct blockage, endoscopic DCR with stenting is safer and more affordable than external DCR.

**INTRODUCTION:**

The dacryocystorhinostomy is a surgery aiming in formation of fistula of the lacrimal sac into nasal cavity. It is the preferred method of therapy for nasolacrimal duct blockage distally. Ophthalmologists and ENT surgeons both perform it. Ophthalmologists do the external approach, and otorhinolaryngologists perform the internal endoscopic transnasal method.

Caldwell provided the first DCR (intranasal method) explanation in 1893. Thanks to McDonough and Meiring, it became well-known.<sup>1</sup> The ability to see the surgery site was impeded by intranasal dacryocystorhinostomy in the twentieth century. The development of fiber-optic endoscopes in the late 1980s and 1990s improved surgical outcomes. It has various benefits, including preventing face scarring, preventing the division of the medial canthal ligament, limiting damage, and maintaining the lacrimal pump drainage.<sup>2</sup>

There are three different approaches for nasolacrimal duct obstruction: external DCR, endoscopic DCR with contact laser and surgical endoscopic DCR without laser.<sup>3</sup> Endoscopic DCR is a simple, minimally invasive technique that may be performed on patients of any age. It offers extensive visibility, a high success rate, and few complications. Holmium:YAG, Argon, and CO<sub>2</sub> are a few of the lasers that are employed. Loop-shaped silicone stents are placed in the superior and inferior canaliculi, removed through the common canaliculi, and then fastened intranasally. Another benefit is the ability to treat related nasal conditions such a deviated nasal septum, hypertrophied turbinates, and concha in the same location<sup>4</sup>.

The stent's purpose is to maintain the neo-patency of ostium throughout the early phases of healing, which lowers the risk of recurrence and synechia development<sup>5,6</sup>.

Chronic dacryocystitis, an inflammation of the nasolacrimal drainage system, causes blockage of the drainage channel. According to the research, utilising stents during surgery has success rates between 63% and 97%.<sup>6</sup> Kerrison punch, powered drill, and lasers are among more modalities used<sup>7</sup>.

Endoscopic dacryocystorhinostomy is recommended when medical therapy is ineffective<sup>8</sup>. Placement of stent intranasally during endoscopic dacryocystorhinostomy

requires surgical techniques with detailed knowledge of intranasal anatomy and keen attention to hemostasis are essential.<sup>10</sup>

**MATERIALS AND METHOD:**

This descriptive clinical case series study was conducted at the Department of ENT, Sapthagiri institute of Medical Science and Research Centre, Bangalore from 2013 to 2022.

There were 50 patients who were treated with endoscopic DCR with silicone stenting. The age of the patients in the study ranged from 26 to 50 years and included both sexes. Informed consent was obtained from the patients.

A detailed history and thorough physical examination was done by ophthalmologist and otorhinolaryngologist to arrive clinical diagnosis. Diagnostic nasal endoscopy and routine blood investigations were done. Lacrimal sac obstruction was confirmed by lacrimal irrigation and Dacryocystogram(DCG).



**Figure 1:** Right distal nasolacrimal duct obstruction in DCG.

Management was mainly surgical and Dacryocystorhinostomy with silicone stenting was done in all cases. Irrigation confirms the complete patency of lacrimal drainage system at 6 months. Further follow up was done at 28 weeks and stent was removed between 3 to 6 months

The resolution of epiphora with patent ostium during nasal endoscopy at the end of six months was accepted as a successful result. The eyes with no epiphora were grouped as good improvement. The eyes which experienced epiphora occasionally were grouped as partial improvement. The eyes that still had epiphora were grouped as no improvement.

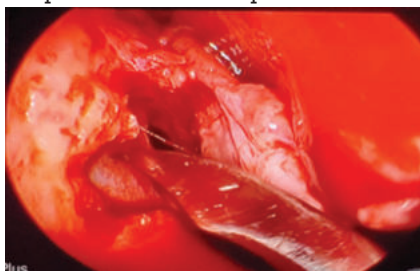
**Surgical Technique:**

All 50 patients underwent DCR under local anesthesia. The nasal cavity on the side of surgery was decongested for 15 minutes using cottonoid pledgets soaked in 5ml of lidocaine 4% with 5ml of xylometazoline.. Patients were given premedication.

Inside the operating room, cottonoid pledgets were removed from the nasal cavity. Using nasal endoscope, 2% lidocaine with adrenalin anesthetic solution was injected submucosally to the lateral nasal wall corresponding to the sac location just anterosuperior to the insertion of the middle turbinate. The initial goal is to expose the lacrimal bone and frontal process of the maxilla. Initially a superior incision should be made horizontally 10mm above the axilla of the middle turbinate. This incision should extend from 2-3mm posterior to the axilla and run forwards for approximately 10mm onto the frontal process of the maxilla. The blade should then be turned vertically and a cut made on the frontal process of the maxilla from the superior incision to just above the insertion of the inferior turbinate. Finally, a cut is made horizontally and the inferior mucosal incision made from the insertion of the uncinata to join the vertical incision. An elevator was used to lift the mucosal flap, keeping the mucosa between the middle turbinate and the lateral nasal wall intact.

Bone over the lacrimal sac area was removed using Kerrison's punch. Lacrimal sac was identified by passing a lacrimal probe through the inferior canaliculus into the sac, or by pressing on the skin inferior and medial to the medial canthus and observing the movement of the sac.

Vertical incision is made on the medial wall of the sac and the opening was widened using cutting punch forceps. The patency of the lacrimal drainage system was checked with saline irrigation. Lacrimal punctum was dilated using punctum dilator. Then silicone stenting was done. Nasal pack was done on operated side.



**Figure 2:** Endoscopic view showing vertical incision done on right lacrimal sac

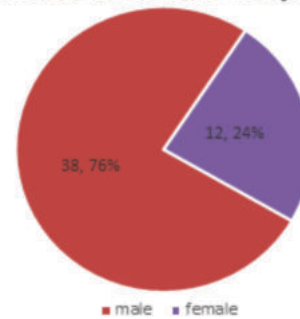
**Postoperative Follow-up**

All the patients were discharged on the next day of the procedure after removing the nasal pack. Oral antibiotics were given for 7 days. Saline nasal drops and topical antibiotic eye drops were given four times a day for 2 weeks and were advised to do lacrimal massage 5 times a day. Patients were examined endonasally in the ENT clinic in second and fourth week in the first month. Nasal endoscopy was done once a month until the stent removal. The stent was removed at the end of 3 - 6 months. Patency of the lacrimal system was assessed by rigid nasal endoscopy and irrigation with saline.

**RESULTS:**

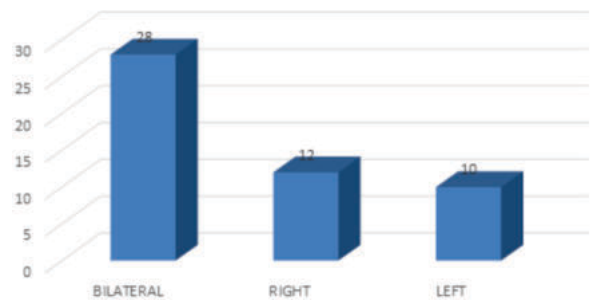
Fifty patients with diagnosis of chronic dacryocystitis were managed from 2013 to 2022 in department of ENT, Sathagiri institute of Medical Science and Research Centre, Bangalore.38 (76%) were females,12 (24%) were males. Among them 28 (56%) had bilateral,12 (24%) had right sided and 10 (20%) had left sided dacryocystitis.

Distribution of sex of subjects



**Figure 3 :** Distribution of sex of subjects

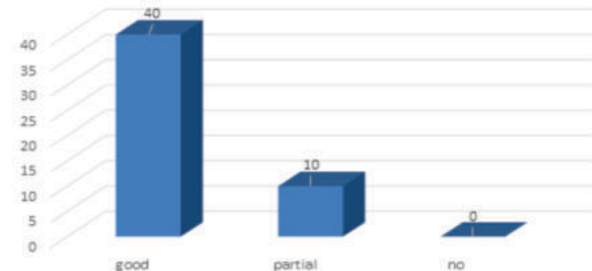
DISTRIBUTION OF DISEASED SIDE



**Figure 4:** Distribution Of Diseased Side

Out of 50 patients , 40(80%) significantly improved epiphora and showed good improvement. Other 10(20%) showed partial improvement in 6months, took more time and showed good improvement.

Distribution based on clinical improvement



**Figure 5:** Distribution based on clinical improvement

**DISCUSSION:**

DCR surgery consists of fistulization of the lacrimal sac into the nasal cavity. It is presently the main stay of treatment of distal nasolacrimal duct obstruction. The first report of DCR (intranasal approach) was by Caldwell in 1893. Later in 1904, Toti described DCR by external approach.

Endoscopic DCR is growing popular as it is a relatively quick and easy surgery for distal obstruction of the nasolacrimal drainage system. Closure of the rhinostomy opening was considered a essential factor for failure in external DCR and inadequate bone removal is one of the cause of failure. Numerous instruments can be used to remove the bone which includes drill, curette, Smith-Kerrison forceps or laser (KTP, Diode, Argon,Holmium: YAG, CO2)<sup>7</sup>.

The success rate depends on providing a wide intranasal

stoma with removal of adequate bone around the stomal area, reducing the chances of postoperative stenosis and adhesions. Inadequate bone removal is the commonest cause of postoperative stomal stenosis. Technical error in locating the sac, intra operative bleeding hampering the vision or small obliterated atrophic sac or impaired canalicular function also leads failure of DCR.

Endocanalicular stenting is believed to maintain the patency of the ostium during the post operative period & healing process. Controversial, silicone stents are used to keep the neo-ostium open after the procedure and are thought to maintain the patency of the ostium by preventing circular stenosis in the post-operative healing period, the use of silicone stents is considered routine in many institutions. Insertion of silicone stents prevents rhinostomy stenosis and helps to stabilize epithelialization between two mucosal surfaces having surgical continuity. A bicanalicular silicone tube is the stent most often used in DCR procedures to prevent obliteration of the rhinostomy opening after DCR.

It has numerous advantages and is widely preferred and shows high success rate. Easy to perform, cost effective, no external incision is done and it prevents restenosis of duct.

**CONCLUSION:**

With newer advances, endoscopic DCR with silicone stenting gives excellent results. It decreases the failure rate to great extent. Further research and learning curve is needed in this area.

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