

## DIFFERENT PROSPECTS OF ENDOSCOPIC DCR

Kapil Kumar Singh<sup>1</sup>, Nikunj Jain<sup>2</sup>, Ajeet Maurya<sup>3</sup>, Vipul Khushwah

<sup>1</sup>HOD, Department of ENT & Neck Surgery, LLRM Medical College, Meerut.

<sup>2</sup>Senior Resident, Department of ENT & Neck Surgery, LLRM Medical College, Meerut.

<sup>3</sup>Junior Resident, Department of ENT & Neck Surgery, LLRM Medical College, Meerut.

<sup>4</sup>Junior Resident, Department of ENT & Neck Surgery, LLRM Medical College, Meerut.

**HOW TO CITE THIS ARTICLE:** Singh KK, Jain N, Maurya A, et al. Different prospects of endoscopic DCR. J. Evolution Med. Dent. Sci. 2018;7(08):1067-1070, DOI: 10.14260/jemds/2018/243

### PRESENTATION OF CASE

Dacryocystitis is the inflammation of lacrimal sac. Acquired dacryocystitis can be acute or chronic.<sup>[1]</sup> Epiphora is invariably present, Acute dacryocystitis is manifested by the sudden onset of pain, erythema, and oedema overlying the lacrimal sac region.<sup>[2]</sup> Other features may be local tenderness that may extend to the nose, cheek, teeth, and face, purulent discharge from the puncta, sac may rupture and fistulise through the skin. More serious sequelae of acute dacryocystitis include extension into the orbit with formation of an abscess and development of orbital cellulitis. In this case series we have 3 patients presenting with epiphora and purulent discharge from puncta.

### DIFFERENTIAL DIAGNOSES

- Acute Complications of Sarcoidosis.
- Adult Blepharitis.
- Bacterial Conjunctivitis (Pink Eye).
- Basal Cell Carcinoma.
- Canaliculitis/ Actinomycosis.
- Chalazion.
- Congenital Anomalies of the Nasolacrimal Duct.
- Conjunctival Melanoma.
- Dermoid Cyst.
- Encephalocele.
- Episcleritis.
- Headache, Children.
- Neonatal Conjunctivitis (Ophthalmia Neonatorum).
- Obstruction Nasolacrimal Duct.
- Orbital Cellulitis.
- Preseptal Cellulitis.
- Primary Congenital Glaucoma.
- Squamous Cell Carcinoma, Eyelid.

### CLINICAL DIAGNOSIS

The diagnosis is clinical and paraclinical.

### Physical examination

Patients of dacryocystitis commonly present with tearing, mattering, purulent reflux from medial canthal massage. Nasolacrimal irrigation should not be performed in patients with obvious mucoid reflux.

*Financial or Other Competing Interest: None.*  
*Submission 21-12-2017, Peer Review 04-02-2018,*  
*Acceptance 12-02-2018, Published 19-02-2018.*

*Corresponding Author:*

*Dr. Kapil Kumar Singh,*

*R-2, Medical College Campus, Near SBI Bank,*

*LLRM Medical College, Meerut-250004, U. P.*

*E-mail: drkapil76@gmail.com*

*DOI: 10.14260/jemds/2018/243*



Rarely present with complication of local cellulitis and orbital cellulitis

### Investigations

Supportive laboratory analysis includes a complete blood count, blood culture and culture of the ocular surface. Antineutrophil cytoplasmic antibody to rule out granulomatosis with polyangiitis (Wegener's granulomatosis). Antinuclear antibody (ANA) testing useful in very rare cases of dacryocystitis caused by lupus involvement of the lacrimal drainage system with resultant obstruction and infection.

### Imaging Studies

- **Plain x-ray films**  
Facial skeletal anomalies, foreign bodies, posttraumatic aetiologies and mass lesions.
- **CT Scans**  
Occult malignancy or mass as a cause of dacryocystitis.
- **MRI**  
Differentiating cystic lesions from solid mass lesions, lacrimal sac diverticuli.
- **Dacryocystography (DCG) and Dacryoscintigraphy**  
Adjunctive diagnostic modalities when anatomical abnormalities of the nasolacrimal drainage system are suspected.

### PATHOLOGICAL DISCUSSION

Congenital dacryocystitis is caused by incomplete canalization of the nasolacrimal duct (specifically at the valve/membrane of Hasner).

Both aerobic bacteria and anaerobic bacteria have been cultured from paediatric and adult patients with dacryocystitis. The most common organisms isolated from the lacrimal sacs of children with dacryocystitis include *Staphylococcus aureus*, *Haemophilus influenzae*, beta-haemolytic streptococci, mycobacterial species, and pneumococci. Methicillin-Resistant *Staphylococcus aureus* (MRSA) is more common in patients with acute dacryocystitis than with chronic dacryocystitis.

Nasal pathology that can predispose to dacryocystitis includes the following: hypertrophied inferior turbinate, deviated nasal septum, nasal polyp, and allergic rhinitis.

Obstruction of the nasolacrimal duct by a tight inferior meatus has been noted in many infants. In our study all 3 patients has staph in pus culture from puncta.

The aetiology of dacryocystitis includes nasal disease and ectrodactyly-ectodermal dysplasia clefting (EEC) syndrome,

as outlined below.

Nasal Disease	EEC Syndrome
<ul style="list-style-type: none"> <li>• Sinusitis (maxillary, ethmoidal)</li> <li>• Hypertrophic rhinitis</li> <li>• Vasomotor rhinitis</li> <li>• Syphilitic rhinitis</li> <li>• Rhinitis ozaenosa</li> <li>• Adenoids</li> <li>• Eczema of nares</li> <li>• Purulent rhinitis</li> <li>• Nasal trauma</li> <li>• Ethmoidal tumor</li> <li>• Nasal tumor</li> <li>• Atrophic rhinitis sicca</li> <li>• Rhinitis fibrinosa</li> <li>• Enlarged inferior turbinate</li> <li>• Foreign body in the nose</li> <li>• Septal deviation</li> <li>• Frontal sinus neoplasm</li> <li>• Nasal mucosal infection</li> <li>• Diphtheria</li> <li>• Measles</li> <li>• Scarlatina</li> <li>• Nasal septal abscess</li> <li>• Ethmoidal mucocele</li> <li>• Rhinolithiasis</li> <li>• Bacterial - Tuberculosis, syphilis, trachoma, Staphylococcus epidermidis (most common), Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli, Pneumococcus, Propionibacterium acnes, Mycobacterium fortuitum</li> <li>• Viral - Infectious mononucleosis</li> <li>• Fungal - Candida albicans, Aspergillus niger</li> </ul>	<ul style="list-style-type: none"> <li>• Osteoporosis</li> <li>• Lupus</li> <li>• Scleroma</li> <li>• Plasmoma</li> <li>• Leukemic infiltration</li> <li>• Trauma - Naso-orbital fractures, LeFort II fractures [3]</li> <li>• Postinflammatory stenosis of nasolacrimal duct</li> <li>• Graft-versus-host disease</li> <li>• Iatrogenic - Caldwell-Luc operation, Lautenschlager-Halle ozena operation, radical maxillectomy, ethmoidectomy, Sturmman-Canfield operation, postpunctal occlusion</li> <li>• Lacrimal sac tumor - Lymphoma, fibroepithelioma, transitional cell carcinoma, lymphoblastoma, neurilemoma, angiosarcoma, hemangiopericytoma, pseudotumour, melanoma, metastatic carcinomas, benign polyps</li> <li>• Lacrimal sac cyst</li> <li>• Postirradiation fibrosis</li> <li>• Wegener granulomatosis</li> <li>• Facial skeletal anomalies</li> <li>• Dacryolithiasis</li> <li>• Cilia impaction in lacrimal sac</li> <li>• IgG4 sclerosing dacryocystitis [4]</li> <li>• Impacted punctal plugs - Studies have documented an increased risk of canaliculitis and dacryocystitis associated with intracanalicular punctal plugs.[5]</li> </ul>

Most cases of dacryocystitis in adults are caused by stenosis of the lacrimal duct with resultant stagnation of lacrimal fluid and subsequent infection. In our study, all 3 patients had nasolacrimal duct blockage.

**DISCUSSION OF MANAGEMENT**

Nasal endoscopy is frequently useful in assessing the aetiology of dacryocystitis.[6]

**Medical Care**

Purulent infection of the lacrimal sac and skin should be treated similarly. Hospitalization is not mandatory unless the patient's condition appears serious.

Treatment with oral antibiotics (e.g., amoxicillin-clavulanate) is appropriate. Acute dacryocystitis with orbital cellulitis necessitates hospitalization with intravenous antibiotics. Ampicillin-sulbactam, ceftriaxone, and moxifloxacin are possible antibiotic alternatives. Vancomycin should be considered for suspected MRSA infection.[7]

In our study, patient with acute dacryocystitis was treated with oral amoxicillin-clavulanate and topical moxifloxacin drops for 5 days. When pus subsided, we planned for surgery. The treatment of choice is a dacryocystorhinostomy whether the patient is symptomatic or not.

**Surgical Care**

Chronic dacryocystitis almost always requires surgery. Acute cases are best treated surgically after the infection has subsided with adequate antibiotic therapy.[8] Some surgeons use an endonasal approach to dacryocystorhinostomy surgery with or without a laser.[9]

Balloon dacryoplasty has been popularized in the last several years, the long-term success rate of balloon dacryoplasty was 40.8% for complete obstructions and 68% for partial obstructions.[10]

**Endoscopic approach has several advantages, including the following [11]**

- It provides a better aesthetic result with no external scar.
- It allows a one-stage procedure to also correct associated nasal pathology that may be causative.
- It avoids injury to the medial canthus and/or pathologic scar formation.
- It preserves the pumping mechanism of the orbicularis oculi muscle.
- Active infection of the lacrimal system is not a contraindication to surgery.
- It is especially superior to the external approach in revision surgery.

- It is much less bloody and messy than the external approach.
- Because of the facility of the approach, the perioperative time is shorter.
- The success rate is comparable to the external approach.
- Its main advantage is the direct visualization of the lacrimal sac and the surrounding anatomical structures, but with the risk of potential injury of the canthal structures, cerebrospinal fluid leak and functional interference with the physiological action of the lacrimal pump.<sup>12,13</sup>

#### Disadvantages of endoscopic surgery

- It requires specialized training in nasal endoscopic surgery.
- The endoscopic equipment is an expense.

In our 3 patients, we did endo-nasal DCR.

#### Common Surgical Steps of ENDO-NASAL DCR

In all three cases, surgical procedure was performed under general anaesthesia. Nose was packed for 7 minutes with soak cottons in a solution containing 30 ml 4% Lignocaine mixed with 3 mg OD adrenaline. A 0-degree endoscope, 4 mm in diameter, was used.

Local infiltrations with 2% lignocaine and 1:100,000 adrenaline solutions, in the region of the anterior attachment of the middle turbinate, were made.

The next step consisted was endoscopic identification of the lacrimal sac. The anatomic landmark for identifying the position of the lacrimal sac is represented by the insertion of the root of the middle turbinate on the lateral nasal wall and the maxillary line.



**Figure 1. Endoscopic picture of nasal anatomy showing anterior end of middle turbinate (MT) and prominence of nasolacrimal duct (NLD)**

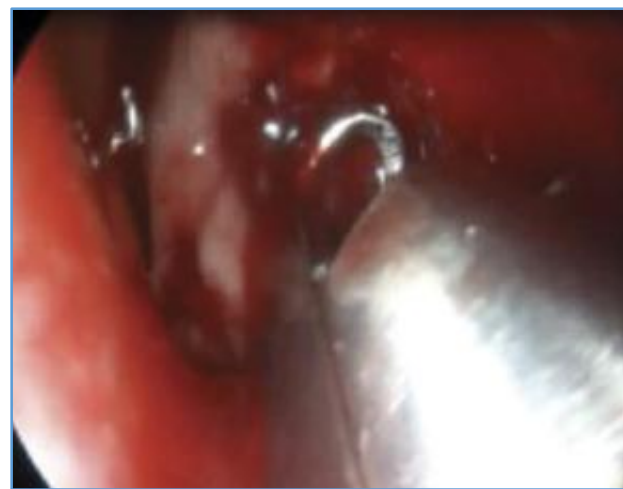
The lateral wall mucosa was incised with a Sickle Knife, and a posterior based flap created containing 3 incisions-

- **First**-Upper incision started adjacent to axilla of middle turbinate extending 7-8 mm outwards
- **Second**- lower incision started just above inferior turbinate extending same 7-8 mm laterally,
- **Third**-incision vertical joining above two incisions and then a posterior based elevated using a Freer elevator. To allow an adequate exposure of the lacrimal bone, we preserved the flaps of to expose the lacrimal sac and the bone

must be removed. This procedure was performed using a Kerrison's punch and drill (Figure 3, 4).



**Figure 2. Intra operative view incision of the lateral wall mucosa**



**Figure 3**



**Figure 4**

The bone removal should start from the maxillary line and performed anteriorly. After bone removal, the lacrimal sac was incised using a sickle knife and, in all cases, the purulent content was evacuated.

After this, lacrimal syringing was done from both upper and lower puncta with betadine to clear purulent secretions

and also patency of nasolacrimal duct was confirmed through nasal endoscopy with free flow of fluid.

Over the years, there have been controversies regarding the use of stents to maintain the patency of the communication between the lacrimal sac and the nasal cavity. The first to introduce the silicon stent was Gibbs in 1988<sup>14</sup>.

In one comparative study, performed in 2009, Kakkar showed that results of endoscopic DCR with and without stent are almost equal.<sup>15</sup> Studies reported by Acharaya et al.<sup>16</sup> and Harvinder et al.<sup>17</sup> had the same results. At the same time, Unlu et al. did not find any significant difference in success between stent DCR compared to non-stent DCR<sup>18</sup>.

Dortzbach et al. showed that silicone intubation is not without complications, the most common one being the biotolerance to this tube.<sup>19</sup>

In our opinion the endoscopic technique, with or without stenting, offers the advantage of a simple procedure performed by ENT doctors with minimal risks.

The procedure facilitates the use of different types of stents. Stenting is important for maintaining stable the permeability of the lacrimal pathways especially when relapses occur.

### Complications

Dacryocystorhinostomy, when properly performed, is a very safe and effective procedure. However, as with all surgical procedures, severe complications can occur.

- Haemorrhage
- Infection.
- Cerebrospinal Fluid (CSF)
- Failure of the dacryocystorhinostomy is most commonly due to an inadequate osteotomy or a fibrous closure at the surgical ostium.

### REFERENCES

- [1] Mills DM, Bodman MG, Meyer DR, et al. The microbiologic spectrum of dacryocystitis: a national study of acute versus chronic infection. *Ophthal Plast Reconstr Surg* 2007;23(4):302-6.
- [2] Pinar-Sueiro S, Sota M, Lerchundi TX, et al. Dacryocystitis: systematic approach to diagnosis and therapy. *Curr Infect Dis Rep* 2012.
- [3] Burduk PK, Dalke K, Olejarz E. Dacryocystitis as a complication of maxillofacial fracture repair with reconstruction. *Otolaryngol Pol* 2008;62(5):536-9.
- [4] Batra R, Mudhar HS, Sandramouli S. A unique case of IgG4 sclerosing dacryocystitis. *Ophthal Plast Reconstr Surg* 2012;28(3):e70-2.
- [5] Mazow ML, McCall T, Prager TC. Lodged intracanalicular plugs as a cause of lacrimal obstruction. *Ophthal Plast Reconstr Surg* 2007;23(2):138-42.
- [6] Ghose S, Chhabra MS, Thakar A, et al. Nasal endoscopy in congenital dacryocystitis. *J Pediatr Ophthalmol Strabismus* 2006;43(6):341-5.
- [7] Cosgrove SE, Avdic E, Dzintars K, et al. Antibiotic Guidelines 2015-2016. Treatment recommendations for adult inpatients. Baltimore, USA: Johns Hopkins Medicine 2015. [http://www.hopkinsmedicine.org/amp/guidelines/Antibiotic\\_guidelines.pdf](http://www.hopkinsmedicine.org/amp/guidelines/Antibiotic_guidelines.pdf). Accessed: May 29, 2017.
- [8] Baskin DE, Reddy AK, Chu YI, et al. The timing of antibiotic administration in the management of infant dacryocystitis. *J AAPOS* 2008;12(5):456-9.
- [9] Spielmann PM, Hathorn I, Ahsan F, et al. The impact of endonasal dacryocystorhinostomy (DCR), on patient health status as assessed by the Glasgow benefit inventory. *Rhinology* 2009;47(1):48-50.
- [10] Konuk O, Ilgit E, Erdinc A, et al. Long-term results of balloon dacryocystoplasty: success rates according to the site and severity of the obstruction. *Eye (Lond)* 2008;22(12):1483-7.
- [11] Marcet MM, Kuk AK, Phelps PO. Evidence-based review of surgical practices in endoscopic endonasal dacryocystorhinostomy for primary acquired nasolacrimal duct obstruction and other new indications. *Curr Opin Ophthalmol* 2014;25(5):443-8.
- [12] Karim R, Ghabrial R, Lynch TF, et al. A comparison of external and endoscopic endonasal dacryocystorhinostomy for acquired nasolacrimal duct obstruction. *Clinical Ophthalmology* 2011;5:979-89.
- [13] Shun-Shin GA, Thurairajan G. External dacryocystorhinostomy – an end of an era? *Br J Ophthalmol* 1997;81(9):716-7.
- [14] Gibbs DC. New probe for the intubation of lacrimal canaliculi with silicone rubber tubing. *Br J Ophthalmol* 1967;51(3):198.
- [15] Kakkar V, Chugh JP, Sachdeva S, et al. Endoscopic dacryocystorhinostomy with and without silicon stent: a comparative study. *Internet J Otorhinolaryngol* 2008;9:1.
- [16] Acharya K, Pradhan B, Thapa N. Comparison of outcome following endoscopic dacryocystorhinostomy with external dacryocystorhinostomy. *Nepalese J ENT Head and Neck Surgery* 2011;2(2):2-3.
- [17] Harvinder S, Rosalind S, Philip R, et al. Powered endoscopic dacryocystorhinostomy with mucosal flaps without stenting. *Med J Malaysia* 2008;63(3):237-8.
- [18] Unlu HH, Toprak B, Aslan A, et al. Comparison of surgical outcomes in primary endoscopic dacryocystorhinostomy with and without silicone intubation. *Ann Otol Rhinol Laryngol* 2002;111(8):704-09.
- [19] Dortzbach RK, France TD, Kushner BJ, et al. Silicone intubation for obstruction of the nasolacrimal duct in children. *Am J Ophthalmol* 1982;94(5):585-90.