Section: ENT

Original Research Article

SURGICAL TREATMENT OF LOWER LACRIMAL PATHWAY OBSTRUCTION: ROLE OF ENT SURGEON

Krupa Suvagiya[1], Vaibhavi Bakul Vyas[2], Prerna Arvindbhai Savaliya[3], Krishna Birendrakumar Makadia[4]

[1]1Assistant Professor, Department of Otorhinolaryngology (ENT), MPKB Medical College, Atkot, Rajkot, Gujarat, India.
[2]Assistant Professor, Department of ENT, Government Medical College, Ratnagiri, Maharashtra, India.
[3]Senior Resident, Department of Otorhinolaryngology (ENT), Institution: Shantabaa Medical College, Amreli, Gujarat, India.
[4]Department of ENT, SDH, Visavadar, District Junagadh, Gujarat, India.

Received : 06/11/2025
Received in revised form : 29/12/2025
Accepted : 15/01/2026

Keywords:
Endo DCR, Epiphora, nasolacrimal duct (NLD), Chronic Dacryocystitis, syringing.

Corresponding Author:
Dr. Krupa Suvagiya,
Email: suvagiyakrupa1112@gmail.com

DOI: 10.47009/jamp.2026.8.1.61

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

Int J Acad Med Pharm
2026; 8 (1); 318-324

ABSTRACT

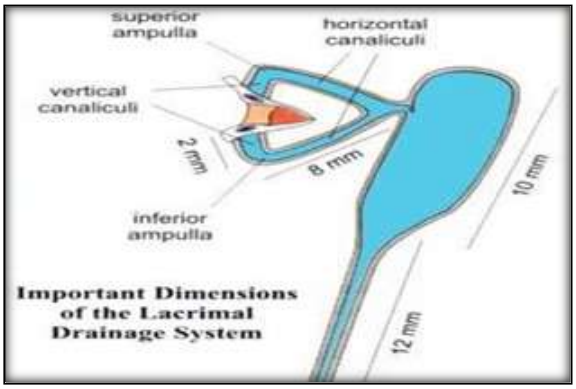
Background: Obstruction of the lacrimal pathway is manifested by epiphora, eyelid stickiness, blurred vision and nasal pain. Surgery is the treatment of choice. Endoscopic Endonasal Dacryocystorhinostomy (EN-DCR) is recognized as the most effective treatment for patients with obstructions of the lacrimal system at the level of the sac or in the nasolacrimal duct with aim to create a passage for tear between the lacrimal sac and the nasal cavity. **Materials and Methods:** A prospective study of 50 patients who were clinically diagnosed of having chronic dacryocystitis in period between July, 2017 to June,2019 was carried out at ENT DEPARTMENT, GMERS Medical College and Civil Hospital, sola, Ahmedabad. Data regarding nose examination, lacrimal drainage system (syringing), per-operative, postoperative complications and surgical outcome were collected and analyzed. Written consent was taken. Surgical outcome was accessed by symptomatic relief and patency of lacrimal drainage system. **Result:** In our study, maximum incidence of disease was found in third and fourth decade of age group and the mean age was 38 years. The incidence in females (80%) were more than males (20%), left side lacrimal sac lesions (64%) are more than right sided (36%) pathology. Total cure rate was 88% by EN-DCR. **Conclusion:** The endoscopic DCR has many advantages over exteternal DCR like scarless surgery, least traumatic, precious technique and less post operative morbidity. Important advantage of performing endoscopic DCR is also preservation of medial canthal ligament of eye which is more physiological because it preserves larcimal pump mechanism, exposure of the sac is much better endoscopically and both the sides can be operated simulteniously if pt has bilateral pathology and gives better esthetic results post operatively which is more acceptable by the patients. And it's an approach for revision cases of Endo or failed External DCR without any complications.

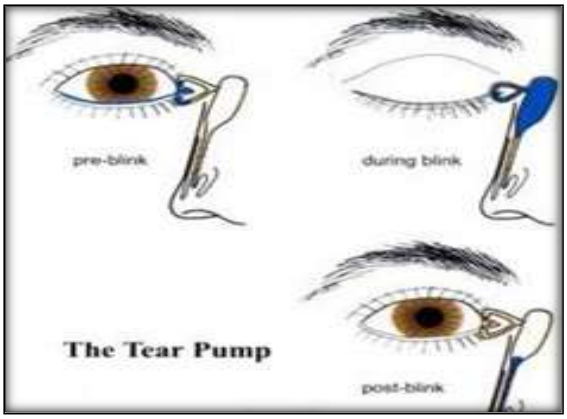
INTRODUCTION

The lacrimal apparatus comprises the structures concerned with the formation of tear by the main lacrimal gland and accessory lacrimal gland and its transport, passage includes puncta, canaliculi, lacrimal sac and nasolacrimal duct. Tear fluid is preserving clear cornea, blinking action of the lids was essential for spreading the tears and maintaining moist surface on anterior portion of the Eyeball. Contraction of the lacrimal part of the orbicularis oculi creates a positive pressure that forces tears down the nasolacrimal duct and into the nose and when the eyes open, the canaliculi and sac expand, creating negative pressure that draws tears from the canaliculi into the sac.

Chronic dacryocystitis is a result of chronic obstruction due to systemic disease, repeated infection and subsequent stagnation of tears in nasolacrimal apparatus due to dacryoliths, chronic inflammatory debris of the nasolacrimal system. The obstruction may be an idiopathic inflammatory stenosis (primary acquired nasolacrimal duct obstruction) or maybe secondary to trauma, infection, inflammation, neoplasm, or mechanical obstruction (secondary acquired lacrimal drainage obstruction).

ISSN (O): 2687-5365; ISSN (P): 2753-6556





There is a bimodal distribution with most cases either occurring just after birth in congenital cases or in adults older than 40 years of age. In adults, whites tend to be more affected. Serious morbidity and mortality are low with dacryocystitis. Chronic Dacryocystitis is generally seen in women of low socioeconomic group due to their personal hygiene, long duration of exposure to smoke in kitchen and dust in external environment. It could be due to consequence of long term use of cosmetics, especially on the rim of the lower eye lids or could be anatomical narrowing of the lacrimal drainage system in female as compared to male.[1]

Dacryocystitis was first surgically endonasal described by Killian in 1889 and popularised by Caldwell in 1893, but failed to gain success due to narrow access to the anatomy of nasolacrimal apparatus. Toti in 1904 was the first one to perform External DCR successfully. With the advancement in the rigid Endoscope, in 1989 McDonough and Meiring performed first successful Endonasal DCR surgery.

Endoscopic Endonasal Dacryocystorhinostomy (EN-DCR) is recognized as treatment for patients with obstructions of the lacrimal system at the level of the sac or in the nasolacrimal duct. During the past 2 decades, advances in rigid endoscopic equipment and other instruments have made it possible to obtain more information about the anatomic landmarks of the nasolacrimal system, which led to the development of less-invasive and safer endoscopic techniques.

Advantages of EN-DCR over the external approach include lower morbidity, reduced intraoperative bleeding, shorter operative time, early rehabilitation and preservation of pump function.

This study has done to analyse effectiveness of EN-DCR for treating 50 Patients having chronic dacryocystitis, present with unilateral or bilateral epiphora, eyelid stickiness, pus discharge from punctum, swelling near medial canthus (sac region), lacrimal sac abscess, fistula formation. This technique also useful for past history of lacrimal surgery like external or endonasal DCR.

Aims and Objectives

- To manage Chronic Dacryocystitis by providing endonasal approach option to patient.
- To observe postoperative complication and reduce postoperative morbidity.
- To access long term result of endoscopic DCR.

MATERIALS AND METHODS

A prospective study of 50 patients who were clinically diagnosed of having chronic dacryocystitis in period between July,2017 to June,2019 was carried out at ENT DEPARTMENT, GMERS Medical College and Civil Hospital, sola, Ahmedabad.

Inclusion Criteria

All patients irrespective of age, sex having epiphora, stickiness of eyelid, swelling or external fistula or abscess at sac region (near lower medial canthus) following nasolacrimal duct blockage were included. (Epiphora due to revision and failed cases of external DCR also included.)

Exclusion Criteria

Congenital dacryocystitis, Suspicious of malignancy, case with canalicular and punctual obstruction /stenosis, Traumatic or bony deformity.

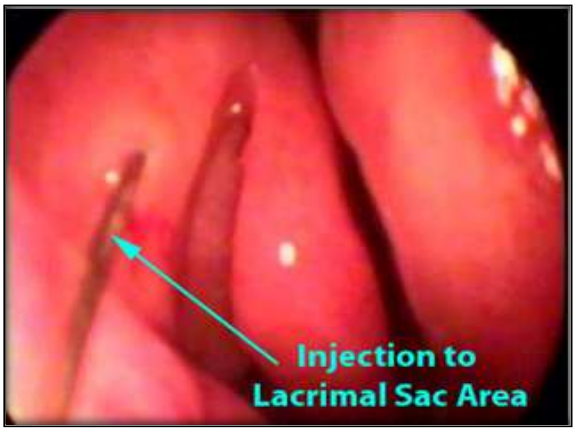
- A complete history, examination, regurgitation test and syringing was done in every patient.
- Endoscopic examination of nasal cavities was done for any nasal pathology especially mucosal disease, hypertrophied middle turbinate, nasal polyp, deviated nasal septum.
- Systemic diseases especially hypertension and diabetes were evaluated.
- All patients were explained about the difference and outcomes of both conventional and endoscopic dacryocystorhinostomy and a written consent from the patients was then taken for endoscopic dacryocystorhinostomy.

Surgical Steps-

Anaesthesia and preparation of surgical field

- Surgery is performed under local or general anaesthesia.
- Position- supine, slightly head flexed to 15 degrees, and slightly rotated towards the surgeon
- Local infiltration- Inject 2ml of 2% lidocaine with 1:200,000 adrenaline into the axilla of the middle turbinate and the frontal process of maxilla

ISSN (O): 2687-5365; ISSN (P): 2753-6556



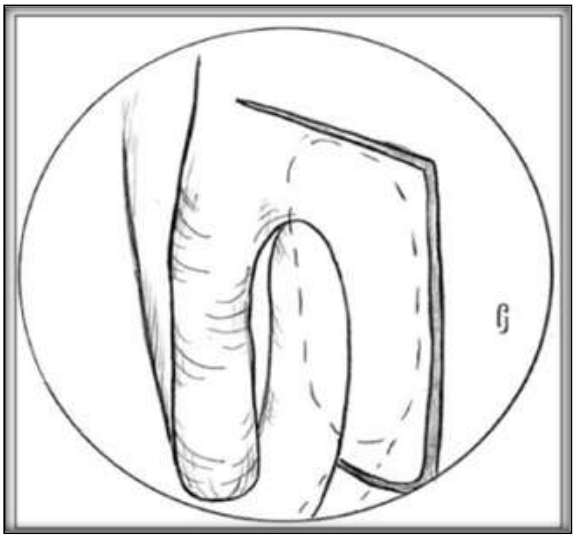
Correction of DNS (septoplasty) must be carried out when it obstruct or limit introduction of endoscope and the operative field (axilla upto end). Ideally place the septal incision on the side contralateral to the DCR.

Create a posteriorly based mucosal flap to expose the lacrimal bone

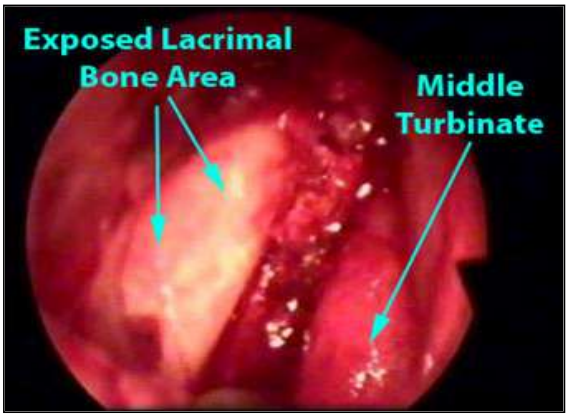
A mucosal flap is fashioned by Using a no 15 scalpel blade to make a superior incision that runs horizontally 8-9 mm above the axilla of the middle turbinate

Extend the incision anteriorly for approximately 10 mm onto the frontal process of the maxilla

Turn the blade vertically until the 2/3 of the middle concha height, Turn the blade horizontally and make the inferior incision from to the level just above insertion of inferior turbinate on lateral wall.

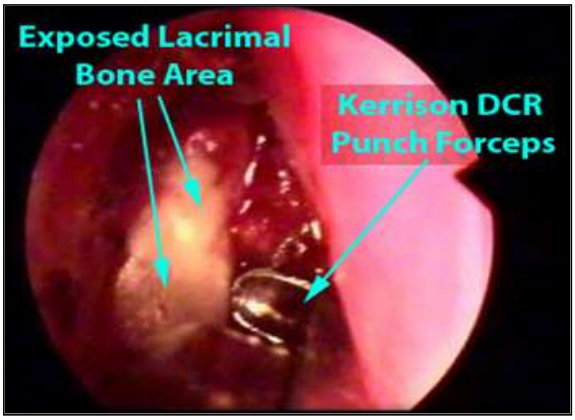


Raise a mucosal flap: Use a suction Freer dissector to raise a posterior based mucosal flap and to expose the junction of the hard frontal process of the maxilla and the thin lacrimal bone, i.e. the lacrimal crest of the maxilla, It is important to stay on bone to avoid losing the surgical plane.



Remove bone to expose lacrimal sac: Use a Kerrison's punch to remove the bone of the frontal process of the maxilla overlying the lacrimal sac.

Bone removal is continued superiorly up to the level of the axilla of the middle turbinate, so the sac forms a prominent bulge into the nasal cavity.



Marsupialise the lacrimal sac: Incise the medial wall of the sac only when the lacrimal probe can be clearly seen tenting the sac wall.

Use a DCR knife or Tonsil blade to vertically incise the sac.

Cut releasing incisions in the posterior and the anterior flaps of the sac.

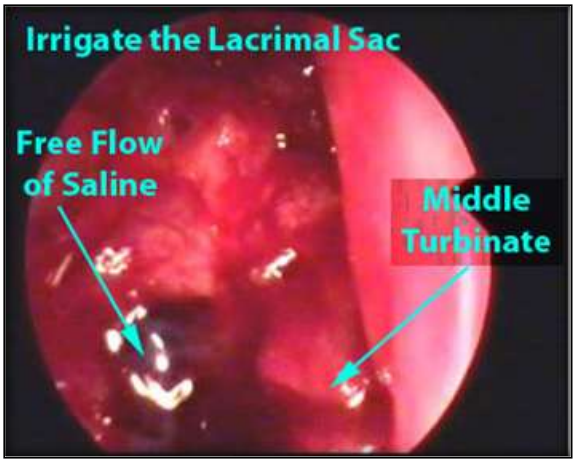
The sac must be widely marsupialised, and be widely open and lying flat on the lateral nasal wall, Trim the

ISSN (O): 2687-5365; ISSN (P): 2753-6556

mucosal flap so that only small superior and inferior rims remain and the lacrimal sac remains wide open. The lacrimal sac flaps remain folded backwards but the nasal mucosal flaps are repositioned to overlap each sac flap to encourage healing and ensure there is no exposed bone.

Pass the lacrimal probe from lower punctum of eye, negotiated it to come out from newly created stoma inside the nose to break any adhesion at opening of nasolacrimal duct.

Carry out sac syringing the free flow of saline indicates successful surgery.



Inserting silastic stents (If required, especially in revision case)

Dilate the puncta with a punctum dilator if the puncta are small Pass the silastic lacrimal tubes through the superior and inferior puncta into the nasal cavity Secure the tubes by tying the ends together, using 4-6 knots, on the nasal side.

Postoperative Care

Postoperatively, patients symptoms were evaluated,

- Prescribe a 5-day course of decongestant nasal drops
- Apply antibiotic+steroid eye drops for 2 weeks
- Patients are again seen at 1 weeks to clean the nose, remove crusts and to remove early adhesions
- Silastic tubes are removed after 4 - 6 weeks (if placed)

Follow UP

Patients were followed up regularly at week 1, week 2, week 6, week 10, 3 months and 6 months.

-endoscopic examination of nasal cavity performed on each visit with endoscope to evaluate the healing process, size and patency of the neo-ostium. Any clot or debris obstructing the ostium was also removed.

-Lacrimal syringing done to check patency.

RESULTS AND DISCUSSION

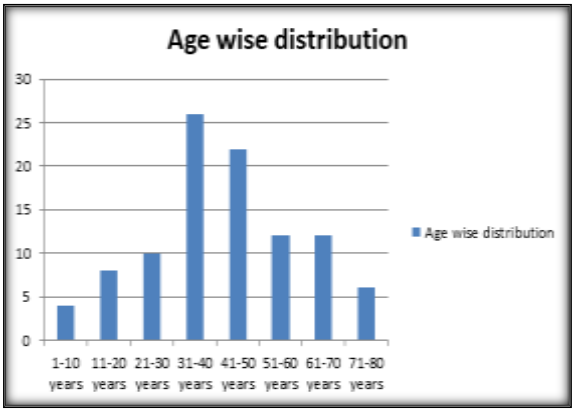


Table 1: Age Distribution

Studies	Age (in years) (M/C presentation)
M Hemanth Rao et al,[18]	31-45yrs
DR. R.Bhanu murthy et al,[19]	30-39yrs (3RDdecade)
Present Study	31-50yrs

In my study, commonest age group is between 31-40 years (26%), majority within 3rd and 4th decade. It is similar to M Hemanth Rao et al and R.Bhanu murthy et al.

Table 2: Gender distribution

Gender	Male	Female	Total
No. of patients	10	40	50
Total in percentage	20%	80%	100%
Studies		**Gender (Most affected)**	
M Hemanth Rao et al18		Female	
Nirupama Moran et al20		Female	
Present Study		Female	

In my study majority of were female (80%) with male to female ratio is 1:4. It could be due to anatomical narrowing of the lacrimal drainage system in female as compared to male.[16]

Table 3: Laterality of Chronic Dacryocystitis

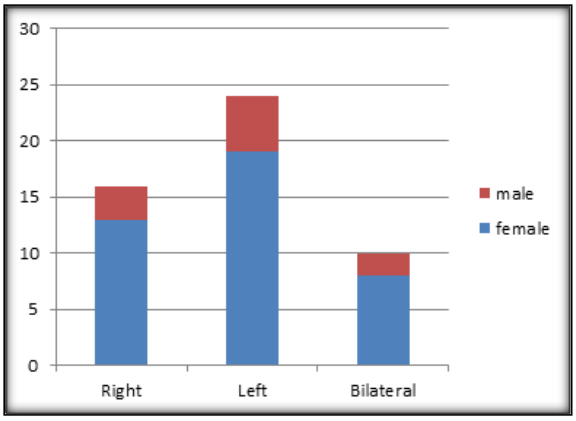
Studies	Laterality (Most common site)
M Hemanth Rao et al,[18]	Left side
DR. R.Bhanu murthy et al,[19]	Left side
Present Study	Left side

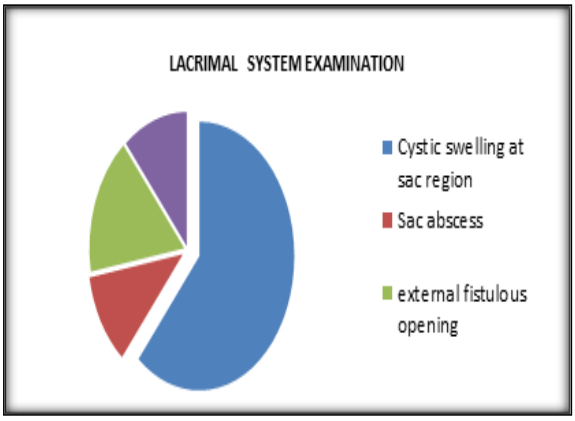
ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 4: Chief Complain of Patients

	Epiphora	Epiphora with Stickiness of eyelid	Epiphora with Swelling at sac region	Epiphora with Purulent discharge from puncta
Male	09	01	-	-
Female	22	02	12	04
Total in percentage	31(62%)	03(6%)	12(24%)	04(8%)

In my study, All patients had chief complain of epiphora (alone or associated with other complain) which is similar to M Hemanth Rao et al18 and Elina Penttila et al.[21]



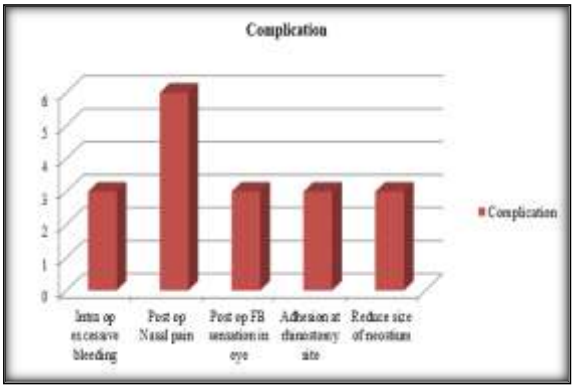


22% patients having cystic swelling near lower medial canthus were noticed in my study.
In case of sac abscess, patients were treated by oral antibiotic and topical eye antibiotic drops for 1-2 weeks, followed by surgical treatment.

Table 6: Result of Endoscopic DCR

Cure/Gender	Male	Female	Total
Total cure	08	29	37(74%)
Fail to cure	02	03	05(10%)
Revision surgery Total cure	00	07	07(14%)
Revision surgery Fail to cure	00	01	01(2%)
Total	10	40	50(100%)
Studies		**Total Cure (Revision and fresh surgery)**	
M Hemanth Rao		90%	
Dr. Nirupama Moran		85%	
DR. R.Bhanu murthy		90%	
Present Study		88%	

12% patients had complain of persisent epiphora and absent nasal patency after sugery. Through nasal endoscopy in follow up, we noticed adhesion, scarring at neostium site in 6% patients and reduced neostium size in 6% patients.
In 6% patients, having sacrring at neostium region, will be plan for revision surgery and another 6% patients, having reduction in size of neostium, will be plan for dilation of neostium.
Among those Patients having septal pathology, nearly 85% patient were required septoplasty along with EN-DCR.



In my study, most common postop complain was nasal pain.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 7: Post-operative complication (n=50)

	No. of patients	%
POST OP nasal pain	06	12%
POST OP foreign body sensation in eye	03	6%
Adhesion/scarring at rhinostony site	03	6%
Reduce size of neostium	03	6%

Table 8: Follow Up

Follow up	Patency		Symptomatic relief	
	Present	Absent	Epiphora -	Epiphora+
1 week	50	00	50	00
6 week	44	06	46	06
6 month	44	06	44	06

In my study,

- At 1 week follow up, all patients had nasal patency present,
- At 6 week follow up,6 patients had complain of epiphora and absent nasal patency. Through nasal endoscopy, we noticed adhesion, scarring at neostium site in 3 patients and reduced neostium size in 3 patients.
- At 6 month follow up, 6 patients had complain of epiphora and absent nasal patency. In 3 patients, having sacrring at neostium region, will be plan for revision surgery and another 3 patients, having reduction in size of neostium, will be plan for dilation.

CONCLUSION

50 patients with clinically diagnosed as chronic dacryocystitis treated by endonasal endoscopic Dacryocystorhinostomywere included in the study.

- Patients were in different age groups, commonest age group is between 31-40 years (26%), majority within 3rd and 4th decade. The youngest patient was 4 year old while the oldest patient was 80 years old.
- In my study majority of were female (80%).
- Left side chronic dacryocystitis is more common (48%). Both the sides can be operated simultaneously if patient has bilateral pathology.
- In my study, All patients were presented with complain of epiphora (alone or associated with sac swelling, eyelid stickiness, purulent discharge from puncta). Among those,24% patients having cystic swelling near lower medial canthus were noticed.
- In my study, patient also required septal surgery to reach target area. Among all Patients, 26% patients having septal pathology and among those nearly 4/5 patients were required septoplasty along with EN-DCR.
- In my study,88% patients were cured from epiphora by endoscopic dacryocystitis.
- During operation, we noticed excessive bleeding in 3 patients who were known case of hypertension. We also noticed excessive fibrous tissue and adhesion in revision cases. We were not found major complication like injury to lamina papyracea, severe lid edema, cerebrospinal fluid leak.
- At 6 month follow up, 6 patients had complain of epiphora and absent nasal patency. In 3 patients, having sacrring at neostium region, will be plan for revision surgery and another 3 patients, having reduction in size of neostium, will be plan for dilation.

Summary: Endoscopic Dacryocystorhinostomy is a valuable treatment method for patient those who present with epiphora and pus discharge from punctum.

The endoscopic DCR has many advantages over exteternal DCR like scarless surgery, least traumatic, precious technique and less post operative morbidity. the added advantage of performing endoscopic DCR is also preservation of medial canthal ligament of eye which is more physiological because it preserves larcimal pump mechanism, exposure of the sac is much better endoscopically and both the sides can be operated simulteniously if pt has bilateral pathology. It gives better esthetic results post operatively which is more acceptable by the patients

REFERENCES

1. Milder B, Demorest BH. Dacryocystography: lacrimal apparatus. Ophthalmology 1954; 51:180.
2. Rajesh Vishwakarma, Neeraj Singh: A Study of 272 Cases of Endoscopic Dacryocystorhinostomy Indian Journal of Otolaryngology and Head and Neck Surgery, Vol. 56, No. 4, October - December, 2004
3. ANEL, D. (1713). "Sur Ia fistule lacrimale", Zappatte, Turin. (Cited by Duke-Elder, 1952.)
4. Davies MJ, Lee S, Lemke S, Ghabrial R. Predictors of anatomical patency following primary endonasal dacryocystorhinostomy: a pilot study. Orbit. 2011;30:49–53.
5. Griffiths JD. Nasal catheter use in dacryocystorhinostomy. Ophthal Plast Reconstr Surg. 1991;7(3):177-86.
6. Dacryocystorhinostomy Chandler PA,Trans Am Ophthalmol Soc. 1936; 34():240-63.
7. Picó G. A modified technique of external dacryocystorhinostomy. Am. J. Ophthalmol. 1971;72(4):679–690.
8. A simplified dacryocystorhinostomy. 1954-1970.Iliff CE Arch Ophthalmol. 1971 May; 85(5):586-91.
9. McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. J Laryngol Otol. 1989;103:585–587.
10. Ozanics V, Jakobiec F. Prenatal development of the eye and its adnexa. In: Jakobiec F, ed. Ocular Anatomy, Embryology, and Teratology. Philadelphia: Harper & Row; 1982:11–96.
11. Imre A, Imre SS, Pinar E, Ozkul Y, Songu M, Ece AA, Aladag I. Transection of Nasolacrimal Duct in Endoscopic Medial Maxillectomy: Implication on Epiphora. J Craniofac Surg. 2015 Oct;26(7):e616

ISSN (O): 2687-5365; ISSN (P): 2753-6556

12. Jones LT, Wobig JL. Congenital anomalies of the lacrimal system. In: Surgery of the Eyelids and Lacrimal System. Birmingham, AL: Aesculapius; 1976: 157–173.
13. Hurwitz JJ. Embryology of the lacrimal drainage system. In: Hurwitz JJ, ed. The Lacrimal System. Philadelphia: Lippincott-Raven; 1996:9–13.
14. Cassady JV. Developmental anatomy of the nasolacrimal duct. Arch Ophthalmol 1952;47:141–158.
15. Duke-Elder S. Congenital deformities. Part 2. In: Duke-Elder S, ed. System of Ophthalmology. Vol 3. St. Louis: CV Mosby; 1964:923–940.
16. www.acadamy.org.uk/lacrimal dilation and syringing David P. Austen
17. Sprekelsen. MB.Endoscopic dacryocystorhinostomy Surgical techniques and results. Laryngoscope.1996; 106:187-89.
18. Woog JJ. The incidence of symptomatic acquired lacrimal outflow obstruction among residents of Olmsted County, Minnesota, 1976 –2000 (an American Ophthalmological Society thesis). Trans Am Ophthalmol Soc 105:649 – 666, 2007.
19. Brig Gen Md Jakaria Hossain MBBS, DO, FCPS, Adviser Specialist in Ophthalmology, CMH Dhaka
20. Hemanth Rao & Satyanarayana; Endonasal Endoscopic Dacryocystorhinostomy for Dacryocystitis Cont Med A Dent September-December 2016 Volume 4 Issue 3 9
21. DR.R.BHANU MURTHY:Clinical Study of Endoscopic Endonasal Dacryocystorhinostomy for Chronic Dacryocystitis-Our Experience in 50 Cases And Review of Literature INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH Volume : 5 | Issue : 6 | June 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48
22. Nirupama Moran,Role of Endonasal Endoscopic Dacryocystorhinostomy In Dacryocystitis IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 4 Ver. X (Apr. 2015), PP 98-100
23. Elina Penttila, Endoscopic dacryocystorhinostomy as treatment for lower lacrimal pathway obstructions in adults: Review article (Allergy Rhinol 6:e12–e19, 2015; doi: 10.2500/ar.2015.6.0116).