

Original Research Article

Nasal Endoscopic Dacryocystorhinostomy – The Nizamabad experience

Anand Acharya^{1*}, Modini P.², G. Lakpati³

¹Associate Professor, ENT Department, GMC, Nizamabad, India

²Associate Professor, Ophthalmology Department, GMC, Nizamabad, India

³Assistant Professor, ENT Department, GMC, Nizamabad, India

*Corresponding author email: acharya.is.anand@gmail.com

	International Archives of Integrated Medicine, Vol. 3, Issue 4, April, 2016. Copy right © 2016, IAIM, All Rights Reserved. Available online at http://iaimjournal.com/	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 29-02-2016	Accepted on: 16-03-2016
	Source of support: Nil	Conflict of interest: None declared.
How to cite this article: Acharya A, Modini P., Lakpati G. Nasal Endoscopic Dacryocystorhinostomy – The Nizamabad experience. IAIM, 2016; 3(4): 15-20.		

Abstract

Chronic dacryocystitis results very often from obstruction to the nasolacrimal duct. It manifests as epiphora or watering of the eyes. The lacrimal sac gets expanded and also the wall of the sac gets thickened as a result of collection of mucopus due to obstruction of the nasolacrimal duct. Treatment of chronic dacryocystitis is by a surgical approach which consists of making an opening between the lacrimal sac and the nasal cavity above the obstruction. This operation is called dacryocystorhinostomy which can be done by external approach or nasal endoscopic approach. The intranasal or nasal endoscopic approach is the more functional route of surgery because it preserves the lacrimal apparatus as near normal as possible. Hence this surgery is being advocated as the first line of treatment for epiphora of chronic dacryocystitis. Experience of nasal endoscopic dacryocystorhinostomy done at Government Medical College, Government General Hospital, Nizamabad, Telangana is being reported with comparison of results published in literature.

Key words

Chronic dacryocystitis, Obstruction to nasolacrimal duct, Epiphora, Nasal endoscopic dacryocystorhinostomy, Dacryocystocoele, Mueller's pump.

Introduction

Tears of the eyes are the result of secretion from the lacrimal gland situated in the orbit on the outer and upper aspect above the eyeball under cover of frontal bone. The secretions drain into

the upper and lower puncta situated at the medial ends of upper and lower eyelids. The secretions drain via the common canaliculus into the lacrimal sac which eventually opens by way of nasolacrimal duct into the inferior meatus of

nasal cavity. The opening is guarded by the valve of Hasner [1].

Obstruction at the level of distal nasolacrimal duct results in epiphora manifested as constant presence of moist eyes and also over flow of tears from the eyes. It also manifests as reddening of eyes, can also cause disturbance in vision and reading due to presence of continuous tear film which cannot be cleared. Treatment consists of diverting the flow above the obstruction by doing a dacryocystorhinostomy [2]. Methods employed for this surgical route is by external approach and an internal approach.

External approach consists of making an incision at the medial end of the orbit at the level of medial canthus. The lacrimal sac is approached and the sac is dissected away from the lacrimal fossa. The lacrimal fossa is perforated with a bone punch or a drill and the nasal mucosa is exposed. Incision of the medial wall of the lacrimal sac and the incision on the nasal mucosa is done. The lacrimal mucosa and the nasal mucosa are sutured to create a fistulous opening connecting the lacrimal sac and nasal cavity.

The intra nasal approach consists of creating a fistulous connection between the lacrimal sac and the nasal cavity via the nose. The lacrimal sac is located above and anterior to the middle turbinate. After elevating the nasal mucosa at the antero-superior level of the attachment of middle turbinate, bony covering of the medial wall of the lacrimal sac is removed by punch or drill if very thick. The medial wall of the lacrimal sac is incised and everted so that there is union of the mucosa of lacrimal sac and the mucosa of the nasal cavity [3].

Intranasal endoscopic dacryocystorhinostomy as it approaches the lacrimal fossa by the nasal route does not need an external incision. Also there is minimal dissection because the bony covering on the medial wall of lacrimal sac is very often thin. The area of lacrimal sac opposite the common canaliculus is covered by the frontal process of the maxilla. At this place bony drilling is needed to expose the lacrimal sac

completely. Dacryocystorhinostomy opposite the common canaliculus does not lead to stenosis and closure. It is this surgical step which is the basis of success of this operation. During intranasal approach, there is no division of the medial canthus. This results in preserving the integrity of the orbicularis oculis muscle. The medial fibres of orbicularis oculi which are attached to the lateral wall of lacrimal sac are preserved. Hence the Mueller's pump mechanism is undisturbed. At the same sitting, any nasal pathology which can be a deviated nasal septum or a hypertrophied middle turbinate or nasal polyposis which can obstruct the surgical opening can be tackled easily.

This way the intranasal approach is a functional surgery for treatment of epiphora due to chronic dacryocystitis. Any granulation which can cause obstruction to the surgical fistula post operatively can be approached directly and can be removed with minimal intervention.

Materials and methods

All patients with constant watering of the eyes, which can be unilateral or bilateral, approached the Department of Ophthalmology were included. Assessment was done by way of ROPLAS test (Regurgitation of Pus on pressure over the Lachrymal Sac) and syringing of the lacrimal drainage path through the lower punctum to confirm the blockage of the distal nasolacrimal duct. Patients with distal nasolacrimal duct obstruction only were selected for endoscopic endonasal dacryocystorhinostomy. Patients were cleared for surgery by general examination and hematological clearance.

Diagnostic nasal endoscopy was done to rule out any nasal causes like deviated nasal septum or polyps in the nose. These caused postoperative adhesions which can block the dacryocystorhinostomy and lead to failure. Septoplasty or polypectomy also was done at the same time as dacryocystorhinostomy in patients who have ipsilateral deviated nasal septum or a

nasal polyp on the same side. Surgical success at the end of operation was confirmed by syringing of the lacrimal sac through the lower punctum.

Patient was followed up postoperatively at the end of 1 week, 1 month and 3 months and 1 year by doing a nasal endoscopy and finding a patent rhinostoma and regurgitation on pressure over the medial canthus [4]. No epiphora at the end of 3 months was taken as a surgical success according to the guidelines published by the Royal College of Ophthalmologists (1999) [5].

From May 2013 to May 2015, a total number of 35 cases of epiphora due to distal nasolacrimal duct obstruction were detected in Government Medical College, Nizamabad. All the cases underwent lacrimal syringing and pre operative surgical hematological and virological clearance. All the patients were operated by nasal endoscopic approach. The results are tabulated and evaluated.

The number of patients operated were 35, constituting 21 females and 14 males. Females outnumbered the males as has been reported in all studies. In our series, left side was more common as compared to the right, 22 patients had on left side and 13 patients had obstruction on the right side. Similar observation has been noted by others. 2 patients had dacryocystocoeles (**Figure - 1**).

Figure – 1: Dacryocystocoele.



Females were noticed to have more nasolachrymal duct obstruction due to

anatomical narrowing, [3], usage of cosmetics, particularly in India where black indigenously prepared kohl used to blacken the edge of the lids-may lead to infections of the punctal opening and using coal and cow dung during cooking leading to chronic conjunctivitis [1].

Untreated chronic dacryocystitis may lead to formation of acute abscess or a dacryocystocoele. All the patients were operated by nasal endoscopic approach under local anesthesia. Nasal packing was done with 4% lidocaine with adrenaline in dilution of 1; 100000 in the area of the attachment of the middle turbinate and the nasal septum. This enabled complete mucosal shrinkage and vasoconstriction along with surface anesthesia and widening of the nasal cavity. Infiltration anesthesia used was local lidocaine infiltration in the area of lacrimal fossa. 2% lidocaine with 1: 200000 concentration of adrenaline was used for infiltration. This area was delineated to be about 2 cm X 1 cm above and inferior to the anterior attachment of the middle turbinate to the lateral wall of the nose often called as axilla of middle turbinate. After 10 minutes interval to let the action of lidocaine and adrenaline to take effect, incision with a No. 15 scalpel blade is given. Mucosa is elevated with an elevator, exposing the medial bony covering of the lacrimal fossa. In many situations, the covering is very thin and friable. The lacrimal bony covering and the thick bone of the maxilla was punched out with 2 mm Kerrison's bone punch. Exposure of the sac is identified with pressure over the medial canthus. Transmitted mobility of the sac by digital pressure on the medial side of orbit at the level of the lacrimal sac confirms the exposure of the sac. During our operations, the exposure of sac on the left side was found to be more direct and quick. There was more difficulty in exposure on the right side due to the handling of the nasal endoscope and also the position of the head rotated to the right side. The frontal process of the maxilla was punched out widely to expose the lacrimal sac till it ballooned out from the lacrimal sac. The help of the ophthalmologist was taken at this stage. The medial wall of the

lacrimal sac was tented by passing a lacrimal probe through the lower punctum. A sharp sickle knife was used to open the lacrimal sac. Posteriorly based flap was developed by making the incision on the lacrimal sac as laterally as possible after exposure of the lacrimal sac. Horizontal cuts on the lacrimal sac lead to a large opening. The everted lacrimal wall was approximated flush with the nasal mucosa. The aim of this step is get the lacrimal sac marsupialised with the nasal mucosa to get a large stoma for persistent, permanent and successful results. The flaps were held in opposition by placing gel foam pieces. The gel foam gets absorbed eventually leading to union of the flaps. A marsupialized lacrimal sac to the nasal cavity is the ideal goal of endoscopic nasal dacryocystorhinostomy procedure [6].

Results

Out of the 35 patients who came with epiphora and swelling beside the eye to the Government Medical College and Hospital, Nizamabad were diagnosed to have distal nasolacrimal duct obstruction. The results were analyzed and tabulated.

All the patients were followed up for a period of 1 year (**Figure – 2**). 29 patients had relief from epiphora. 5 patients had a decrease in the amount of watering from the eye. 1 patient had no relief. Repeat syringing revealed a total obstruction at the nasal level. This patient was taken up for revision surgery which revealed closure of the nasal opening. Stoma was reopened and marsupialised. 29 patients had relief which is 82% success rate comparable with other studies [7]. Operating time was noticed to be 15 to 25 minutes. Minor bleeding from the operating site was noticed in 5 cases. Thick bone at the lacrimal fossa needed punch and gouge for bone removal for exposure of lacrimal sac in 5 cases.

One patient had a grossly deviated septum towards the side of operation (**Figure - 3**). Lacrimal fossa could not be visualized during endoscopy (**Figure - 4**). Hence septoplasty was

necessary in this patient before the main surgery for proper exposure of lacrimal sac (**Figure - 5**). Post operative adhesions and closure of dacryocystorhinostomy opening are definite occurrences when septum is deviated to the same side if not operated before dacryocystorhinostomy. Hence, septoplasty operation is necessary.

Figure – 2: Postoperative 1 year after endonasal dacryocystorhinostomy.



Figure – 3: Deviated nasal septum towards lacrimal fossa on left side.



Presence of Dacryocystocele caused bone thinning and expansion of lacrimal sac. This enabled easy exposure and sac incision and eversion of edges was easy. The results of surgery were more predictable when dacryocystocele was present. Chronic

dacryocystitis results in thickening of the sac and incision is noticed to be difficult. Also eversion of the sac was found to be cumbersome because of fibrosis.

Figure – 4: Endoscopic picture of DNS.



Figure – 5: Lacrimal fossa after septoplasty.



Discussion

Epiphora due to chronic dacryocystitis or dacryocystocele resulting from obstruction to distal part of nasolacrimal duct, is treated surgically by creating a fistula between the lacrimal sac and the nasal mucosa.

Chronic dacryocystitis is a disease affecting the pediatric as well as adult individuals. It affects the poor socioeconomic as well as people with good nutrition. Causes of anatomical narrowing of the nasolacrimal duct are seen more often in females. Hence the presentations in the literature show a female predominance. More cases are on the left side –reasons attributed are anatomical or genetic-not entirely defined. Poor eye hygiene resulting from use of cosmetics to darken the eyelids, more particularly in females, particularly

kohl or *kajal* using indigenous materials which are not clean, leads to obstruction of the lower puncta or the distal nasolacrimal duct.

Operative treatment described is by making a fistula between the lacrimal sac and the nasal mucosa to bypass the distal nasolacrimal duct. The fistula is to be done above the level of obstruction so that the tears drain into the nasal cavity. External approach consists of making an incision at the level of medial canthus of the orbit and making a fistula by lateralizing the lacrimal sac and creating a bony window in the lacrimal fossa and suturing the lacrimal and nasal mucosal flaps. This means making an incision on the face and it also entails cutting the orbicularis oculis muscle which hampers the pump mechanism of drainage of the lacrimal secretions. The other route of surgical method is to create a fistula between the lacrimal sac and the nasal mucosa by endo nasal route. This avoids an external scar and also does not damage the orbicularis muscle covering the lateral aspect of lacrimal sac as the approach is medial to the sac. This approach is more functional as the physiology of drainage of lacrimal secretions is not disturbed. This route of surgery also can be revised if there is obstruction to the stoma easily by nasal approach.

The nasal endoscopic dacryocysto rhinostomy has undergone many developments since its introduction by West [8]. Usage of indwelling silicone stents, light source into the sac by using intra canalicular fiberoptic cable to define the lacrimal sac, endonasal laser to create a fistula, suturing the lacrimal and nasal flaps to get a good stoma and using clips to keep the stoma patent have been devised of late [9]. Our experience in using these advances is limited because of non-availability of the appliances needed. The results of approaching the lacrimal sac endonasally are comparable to the studies reported in the literature. As the learning curve improves, the satisfaction of good outcome to both the surgeon and the patient will improve.

Conclusion

Endonasal endoscopic dacryocystorhinostomy is a surgical procedure to overcome the epiphora resulting from obstruction to the nasolacrimal duct at the distal end. It is a functional surgery of the lacrimal drainage system. It retains the pump mechanism of the lacrimal sac. It does not involve the cutting of the medial bundles of orbicularis oculis muscle because the approach is from the opposite end. Mueller's pump mechanism leads to a dilatation of the lacrimal sac on closure of the orbicularis oculis muscles leading to a suction action on the tears collected in the medial side of conjunctival sac. It avoids incision on the face. It can be done even in cases of lacrimal abscess and impending rupture of the sac abscess. It can prevent a lacrimal fistula as the abscess drainage from the nasal side leads to decongestion of the abscess. It needs a learning curve. Initial results may be discouraging but steps to improve the results lead to good results. Making a wide bony opening in the lacrimal fossa, eversion of the sac flaps, removing the bone of the frontal process of maxilla to expose the common canaliculus, insinuating the nasal flap onto the lacrimal sac after exposure lead to good results [6]. Selecting cases with left side obstruction in the beginning of the learning gives good encouragement as the approach is easy on left side. Patients with dacryocystocele give good results because of expansion of the sac due to long standing obstruction and thinning of the lacrimal bone helps in easy dissection and ease of approximation of nasal and lacrimal sac flaps, Chronic dacryocystitis results in thick and densely adherent flaps and gives an impression of good stoma but it is found to contract and close or narrow the stomal opening.

Acknowledgements

We thank the Superintendent, Government General Hospital, Nizamabad for permitting us to use the hospital patient records for this study and report.

References

1. Singh M, Jain V, et al. Intranasal endoscopic DCR (End-DCR) in cases of dacryocystitis. *Indian J Otolaryngol.*, 2004; 56(3): 177-183.
2. Becker BB. Dacryocystorhinostomy without flaps. *Ophthalmic Surg.*, 1988; 19: 419-427.
3. Naik S. Comparative study of prolene wire stent & silicon tube stent used in 150 cases of endonasal dacryocystorhinostomies. *Pakistan J Otolaryngol.*, 2011; 27: 42-45.
4. Vishwakarma R, Sing N, Ghosh R. A study of 272 cases of endoscopic dacryocystorhinostomy. *Ind J Otolaryngol Head Neck Surgery*, 2004; 5(4): 260-262.
5. Yung MW, Hardman-Lea S. Analysis of the results of surgical endoscopic dacryocystorhinostomy: Effect of the level of obstruction. *Br J Ophthalmol.*, 2002; 86: 792-794.
6. Tsirbas A, Wormald PJ. Endonasal dacryocystorhinostomy with mucosal flap. *Am J Ophthalmol.*, 2003; 135: 76-83.
7. Leong Sc, Karkos PD, Burgess P, Haliwell M, Hampal SA. Comparison of outcomes between nonlaser endoscopic endonasal and external dacryocystorhinostomy: single centre experience and a review of British trends. *Am J Otolaryngol.*, 2010; 31: 32-37.
8. Hartikainen J, Antila J, Varpula M. Prospective randomized comparison of endonasal endoscopic dacryocystorhinostomy and external dacryocystorhinostomy. *Laryngoscope*, 1998; 108: 1861-1866.
9. Kirtane M V, Abhineet Lall, Kashmira Chavan, Dhruv Satwalekar (2013) Endoscopic Dacryocystorhinostomy with Flap Suturing. *Indian J Otolaryngol Head Neck Surg.*, 2013; 65(Suppl 2): S 236-241.