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Original Research Article

Endoscopic dacryocystorhinostomy for nasolacrimal duct obstruction: an assessment of post-operative outcomes at a tertiary health care centre

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ABSTRACT

Background: Endoscopic dacryocystorhinostomy (Endo DCR) is a well-established surgical treatment for nasolacrimal duct obstruction (NLDO) cases. Advances in surgical technique and a better understanding of the anatomy have resulted in improvement of the success rate. The objective of this study is to assess the factors responsible for the recurrence of nasolacrimal system obstruction by evaluating the post-operative outcomes of Endo DCR at a tertiary health care centre.
Methods: A retrospective study was conducted in the department of ENT, GVP IHC and MT, Visakhapatnam – Andhra Pradesh on 52 patients who underwent Endo DCR procedure from September 2018 to September 2021. The data regarding lacrimal drainage system, operative details, surgical outcomes and complications were analysed.
Results: Fifty-two patients (18 male and 34 female) underwent 63 Endo DCR surgeries for NLDO. Success was achieved in 50 cases (79.4%), and failure in 13 (20.6%). Of the 13 failed cases, anatomical obstruction at the fistula site was found in 6 (46.2% of failed cases), whereas functional failure with no evidence of obstruction was found in 7 (53.8%).
Conclusions: The success rate appears to be influenced by preoperative parameters like clinical as well as radiological examination of eye and nose; ruling out intraoperative conditions like sinusitis, deviated nasal septum, polyps. These are essential for better coordinating therapeutic expectations and better patient selection. Endo DCR proved to be a safe invasive procedure as it has direct approach to the sac and produced excellent results without any external scar.

Keywords: Dacryocystitis, Endo DCR, Nasolacrimal duct, Epiphora

INTRODUCTION

Chronic obstruction of the nasolacrimal duct leads to inflammation or infection of the lacrimal sac (dacryocystitis). The main symptom of dacryocystitis is epiphora, sometimes inflammation of conjunctiva and extrudation of pus from puncta may be seen.[1] Endoscopic dacryocystorhinostomy (Endo DCR) is a procedure that involves creating a passage of the lacrimal sac into the nose by bypassing the obstructed nasolacrimal duct.[2] It is the standard treatment for nasolacrimal duct obstruction. The lacrimal sac, which is connected to the nose, is opened by removing the bone and the mucosa between these two structures at the level of the middle meatus. The traditional technique-of-choice by ophthalmologists is the external approach, in which an incision is made on the skin in order to access the bone, followed by an external osteotomy, opening the nasal mucosa and creating the lacrimal sac flaps from outside to the inside.[3] The Success rates of DCR by both approaches, the external and the endoscopic one, are higher than 90% in experienced hands. For the patients who wants to avoid a scar on the face, Endo DCR is an

alternative to conventional technique. Endo DCR is a safe, fast and effective method to relieve stenosis distal to the common canaliculus. It Should also be considered for revision surgery in the patients who have a failed External DCR. The ophthalmologist is responsible for the differential diagnosis of epiphora as well as for indicating the surgery, intra and post-operative syringing. The otorhinolaryngologist is then responsible for the pre-operative diagnosis of associated nasal disorders (i.e. Obstructive deviation of the nasal septum, nasal conchae hypertrophy, synechia, polyps, chronic rhinosinusitis, and others) and the concurrent intraoperative treatment of these disorders when present, besides exposing, opening and making the lacrimal sac flaps assisted by nasal endoscopy. Postoperative care must be carried out by both, ophthalmologist and otorhinolaryngologist, until complete healing and the patency of lacrimal pathway is achieved.[4]

Endo DCR has many advantages over external DCR. It is less invasive technique. Endo DCR avoids a potential injury to the medial canthal structures thus retaining the pump mechanism. Co-existing factors like nasal septal deviation, hypertrophied turbinates and paranasal sinus diseases can simultaneously be dealt in the same procedure. This technique reduces operative time and patient morbidity and also controls hemostasis.[5] The present study was conducted with the aim to assess the factors responsible for the recurrence of nasolacrimal system obstruction by evaluating the post operative outcomes of EndoDCR.

METHODS

A retrospective clinical study was conducted in the department of ENT, GVP IHC and MT, Visakhapatnam – Andhra Pradesh on 52 patients who underwent 63 Endo DCR procedures from September 2018 to September 2021. Preoperatively, all patients underwent a comprehensive ophthalmologic examination and an assessment of the lacrimal drainage system including the lacrimal syringing test and probing along with preoperative diagnosis of associated nasal disorders. Endo DCR was indicated when the obstruction site was located in the lacrimal sac (saccal obstruction) or in the nasolacrimal duct (postsaccal obstruction). Surgical success was defined as symptomatic improvement with no further episodes of dacryocystitis and a patent rhinostomy evidenced endoscopically after the surgery. Failure was considered as anatomical if the rhinostomy osteum was closed and functional if the osteum was open but the epiphora symptoms persisted. The data regarding lacrimal drainage system, operative details, surgical outcomes and complications like nasal bleeding, sump syndrome, nasal synechiae, post-operative crusting were all recorded and analysed.

Statistical analysis

Data were entered in MS-Excel and analysed in Statistical package for social sciences (SPSS) V25. Descriptive statistics were represented with percentages, Mean with SD.

RESULTS

Fifty-two patients underwent 63 Endo DCR surgeries for NLDO.

Table 1: Demographic data of study subjects.

Variable	Category	Count	%
Age	26-35	17	32.7
	35-44	35	67.3
Gender	Male	18	34.6
	Female	34	65.4

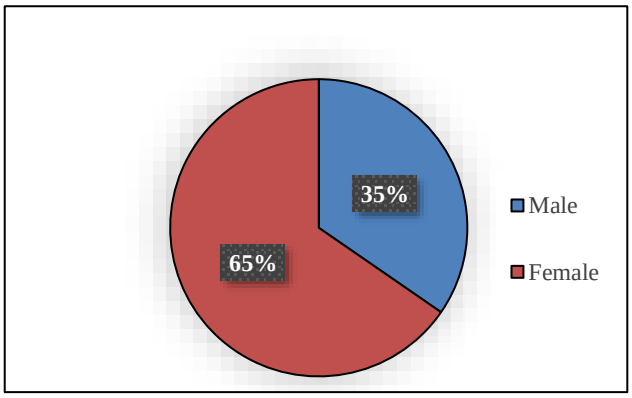

Figure 1: Distribution of study subjects according to their sex.

Table 2: Distribution of study subjects according their laterality of operation.

Lateral	Count	%
Only left	17	33
Only right	24	46
Both	11	21
Total	52	100

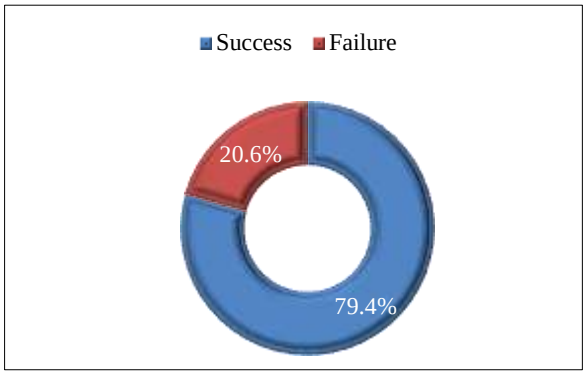

Figure 2: Surgical outcome in Endo DCR cases.

From table1 majority (67.3%) of the study subjects were in the age group 35-44 years. 65.4% were females.

Table 3: Abnormalities in failure cases.

Abnormalities in failed cases	Count	%
Anatomical obstruction at the fistula site	6	46.2
Functional failure with no evidence of obstruction	7	53.8

79% of the study subjects had unilateral and 21% had bilateral operation.

Success was achieved in 50 cases (79.4%), and failure in 13 (20.6%) (Figure 2).

Of the 13 failed cases, anatomical obstruction at the fistula site was found in 6 (46.2% of failed cases), whereas functional failure with no evidence of obstruction was found in 7 (53.8%).

Post-surgery complications

Surgery revision was performed in 13 cases, but it was successful in only 6 cases; patients who failed the first revision were likely to benefit from additional revisions. Complications included 1 patient with nose bleeding on the first postoperative day that resolved with nasal packing and 2 patients with sump syndrome that resolved after endoscopic revision, nasal synechiae seen in 3 cases (4.8%) and postoperative crusting in 15 cases (23.8%).

DISCUSSION

In the present study, most of the patients were in 35-44 years age group and female dominance was observed. The study by Woog, which examined the epidemiology of lacrimal obstruction, demonstrated that the most common form of acquired symptomatic lacrimal obstruction is nasolacrimal duct obstruction (NLDO), which occurs with an annual frequency of 0.02%. The same study also confirmed that acquired lacrimal pathway obstruction was most common in middle-aged individuals which was in accordance with our study. Moreover, 69% of patients with all forms of obstructions and 73% with NLDO were female which was also observed in our study. The close anatomic relationship of the lacrimal sac, nasolacrimal duct, and paranasal sinuses may represent a major predisposing factor for the obstruction of the nasolacrimal pathway. Acute infections in the nasal cavity or recurrent and chronic infections of the paranasal sinuses can readily spread through the nasolacrimal duct, followed by mucosa inflammation before scar formation and final stenosis.[6]

Ophthalmologists and otorhinolaryngologists, particularly those specializing in performing Endo DCR, are the primary consultants for patients with disorders of the lacrimal duct. The goal of the basic examination is to determine the reason of epiphora or lacrimation. Epiphora may be a result of a disorder of tear drainage, example-caused by mechanical obstruction, lid malposition, or lacrimal pump failure. Excessive tearing may also be caused by reflex hypersecretion. The reasons for hypersecretion may be dry eye syndrome, allergy, infections, tumours, hormonal changes, foreign bodies, and many neuronal stimuli. Diagnostic probing and syringing of the lacrimal pathway are usually sufficient to evaluate the function of the lacrimal drainage system or to determine the location and extent of the obstruction in patients with epiphora. If the nasolacrimal pathway is open, then the solution flows freely into the nose. In cases of canalicular stenosis, the cannula cannot contact the bony wall of the lacrimal sac, and this results in reflux through the irrigated punctum. If the stenosis is in the common canaliculis or in the lower lacrimal pathway, then reflux will occur via the opposite punctum.[7]

Manfred Weidenbecher et al in his study noted 72% of septal deviation, 32% of maxillary sinusitis, 20% hyperplasia of turbinates, 14% nasal polyposis and none of these in 16% patients.[8] In our study, associated nasal pathology was DNS which was seen in 8 patients (16%), but none required septoplasty as it was not obscuring the field of surgery.

In this study, success rate was defined by an anatomically patent nasolacrimal system ascertained by nasolacrimal irrigation at the end of 4 months after surgery. 57 (90%) patients had successful outcome at the end of 4 months. The success rates were comparable with the success rates of studies done by David et al, who reported 100% success rate.[9] Hartikainen et al reported a success rate of 75%, and Cokkeser et al reported a success rate of 88.2%. Cases in which the lacrimal passage remained blocked and showed persisting epiphora were regarded as failure. Regurgitation on pressure over lacrimal sac area was positive in most of these cases. Onerci et al quoted, false localization of the lacrimal sac, granulation tissue formation, retained bony spicules, inadequate removal of the medial wall of the sac and synechiae between the lateral wall and the middle turbinate are the most common cause of failure.[10]

It is indisputable that postoperative care has a major influence on the healing process and plays an important part in the success or failure of Endo DCR. Postoperative care options include the administration of systemic antibiotics or a combination of antibiotic-steroid eye drops, local irrigation of the rhinostomy site with a saline solution nasal spray, intranasal steroids, and debridement of the intranasal wound. In this study 15 (30%) patients had a problem of crusting which was removed under endoscopic guidance and patients were advised for alkaline nasal douching to prevent further crusting. 3 patients (6%) had synechiae at rhinostomy site. Hartikainen et al came to the conclusion that the most important modification necessary to improve the success rate for endoscopic DCR is a weekly postoperative intranasal cleaning of crusts and mucus at the rhinostomy site, which was true in our study too.[11]

The outcome assessments should be based on relief of symptoms, absence of dacryocystitis, and objective signs, and there needs to be an adequate follow-up time. The assessments of objective findings include endoscopic visualization of neo-ostium, lacrimal sac irrigation. Patient satisfaction regarding symptom relief and improvement in quality of life is the predominant consideration when determining the success of a surgical intervention. We examined various pre-operative and operative parameters that might influence the surgical outcome in order to identify reasons for failure and to improve patient selection. However, Jung et al studied the outcome of 1083 Endo DCR surgeries and reported that age, sex, early tube removal, and indication for surgery were not correlated with higher failure rates.[12]

Although the success rate of primary Endo DCR is high, not all procedures succeed, in particular, revision procedures tend to have a lower success rate. Surgery revision was performed in 13 cases, but it was successful in only 6; patients who failed the first revision were likely to benefit from additional revisions. The most common reason for the failure of this operation is the formation of granulation tissue or scar over the rhinostomy site.

Limitations

In the present study, only 52 cases, underwent 63 Endo DCR surgeries for NLDO. A large sample study may produce better results.

CONCLUSION

The success rate appears to be influenced by preoperative parameters like ocular and nasal clinical examination involving probing, sac syringing, diagnostic nasal endoscopy and radiological examination involving CT PNS and by ruling out intraoperative conditions like sinusitis, deviated nasal septum, polyps. These are essential for better coordinating therapeutic expectations and better patient selection. The findings of the study also concluded that Endo DCR was a simple, safe and less invasive procedure as it has direct approach to the sac. It can be performed as a day care procedure under local and general anaesthesia with excellent results. This procedure is cosmetically acceptable as there is no external scar. It has the advantage of operating in acute cases, lacrimal abscess and any intranasal pathology can be dealt simultaneously. Small lacrimal sac and site of obstruction were important risk factors for functional failure in cases with lacrimal drainage obstruction.

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