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Endoscopic Endonasal Dacryocystorhinostomy: Best Surgical Management of Chronic Dacryocystitis

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ABSTRACT

Objective

To determine the outcome and success rate in endoscopic endonasal dacryocystorhinostomy in form of reduction in symptom and postoperative patency of sac.

Method

It is retrospective study which was carried out in ENT department of P.D.U. medical college and hospital, Rajkot during 2 years. Demographic information, presenting symptoms, clinical assessment, surgical management, postoperative functional status and follow-up were recorded..

Results

100 cases of chronic dacryocystitis were operated by endoscopic endonasal DCR. The average age group was 31-40 years(44%) with 56 females and 44 males. 16 cases had deviated nasal pathology so that simultaneously septoplasty with endoscopic endonasal DCR was done. 6 operated cases had failed due to synechiae formation. Overall success rate of endoscopic DCR was 86%.

Conclusions

Endoscopic endonasal dacryocystorhinostomy is preferred technique and best surgical management of chronic dacryocystitis with nasolacrimal duct obstruction.

KEYWORDS: Endoscopic endonasal dacryocystorhinostomy, Nasolacrimal duct, lacrimal apparatus, Chronic dacryocystitis, Epiphora, Neo-ostium

I. INTRODUCTION

The nasolacrimal drainage system serves as a conduit for tear flow from external eye to the nasal cavity. Epiphora (excessive watering) is a common complaint which can be secondary to excessive production of tears or arise from proximal obstruction in drainage system[1]. Dacryocystorhinostomy (DCR) is the standard treatment for nasolacrimal duct obstruction[2]. Dacryocystorhinostomy (DCR) is a surgical procedure by which the lacrimal flow is diverted into the nasal cavity by making an artificial fistula in the lacrimal sac when nasolacrimal duct gets blocked. Dacryocystorhinostomy has two approaches one is external or convential method and the another one is endoscopic endonasal method. External dacryocystorhinostomy (DCR) was first described in 1904 by Toti[3]. In the hands of experienced surgeons, success rates for external DCR are between 90 and 95%[4]. External DCR was previously considered as the best treatment of chronic dacryocystitis but Caldwell firstly introduced endonasal approach which was later modified by West in 1910[5]. Endoscopic endonasal DCR was firstly performed by Rice in 1988 and has several advantage like no facial scar and preservation of lacrimal pump[6,7] .The endoscopic approach also provides the surgeon unprecedented visualization of the lacrimal sac during dissection and marsupialization[7]. The endonasal surgical approach of the lacrimal sac assisted by endoscopy is carried out today with high success rates. Despite the satisfactory results reached with the traditional external approach, but it has the disadvantage of requiring a skin incision and a consequent local scar[8,9].With the development and enhancement of the endonasal techniques, the endoscopic approach is increasingly preferred by surgeons. In this study, we describe our experience with convential endoscopic endonasal DCR without any other assisted technique. Objective of this study is to determine the outcome and success rate in endoscopic DCR in form of reduction in symptom and postoperative patency of sac and also briefly review the lacrimal sac anatomy.

II. MATERIAL AND METHODS

It is retrospective study which was carried out in ENT department of Pandit Deendayal Upadhyay medical college and hospital Rajkot, Gujarat , India among 100 cases over the period of 2 years from June 2017 to may 2019. We were included all patients of chronic dacryocystitis(CDC) with complete nasolacrimal duct block, after resolution of acute inflammation, CDC associated with allergic rhinitis or deviated nasal septum. Patients were properly explained about prognosis. We excluded all patients of active dacryocystitis, canalicular obstructions, lacrimal

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sac tumour, dacryolith, traumatic obstructions and previous history of external DCR surgery. In 1966, Bjork described the bicanalicular intubation in endoscopic dacryocystorhinostomy, which was limited to cases of canalicular disorders and reoperations[10,11]. We studied 100 patients fulfilling inclusion criteria. 20 out of 100 cases of chronic dacryocystitis with allergic rhinitis and 16 cases with deviated nasal septum. All patients of epiphora were preoperatively assessed clinically. Besides the clinical examination, all routine laboratory test and blood investigation has been done. Tearing is what we call an excess of tears caused by irritation (conjunctival disease, blepharitis, eyelid malpositioning, and others). Epiphora is the tearing that happens secondary to obstruction of its draining system: stenosis or obstruction of the lacrimal point(s) and/or canaliculi or nasolacrimal duct block. Preoperatively, through examination of lacrimal system that included probing test and sac syringing that was done and diagnosis was confirmed by ophthalmology department in all patients. Lacrimal flow can be assessed using the Jones dye test[12.] The Jones I test is a functional measure of tear flow. It is performed by placing a drop of fluorescein dye into the eye, followed by intranasal observation for tear flow. An endoscope (or cotton-tip applicator) is placed into the nose after 2 and 5 minutes. If dye is noted, patency and function is confirmed. Unfortunately, false-negative tests can be seen in up to 42% of patients. It is very important to have a preoperative diagnosis of stenosis or narrowing, for instance, of the canalicular system, because in such cases, besides the possibility of correcting it in the same dacryocystorhinostomy procedure, the patient must be told of the possibility of a worse surgical outcome. Dacryocystography is a diagnostic test that is very much utilized to pinpoint the site of obstruction, in which a contrast medium is injected through the canaliculus and a radiograph is taken. Usually, when we have a complete obstruction of the nasolacrimal duct, we find an upstream dilatation of the lacrimal sac[13]. Contrast medium failure in penetrating the lacrimal sac may indicate obstruction of the common canaliculus. Should the contrast pass easily through the nasolacrimal duct, this may indicate a functional problem instead of an anatomical one. The test is contraindicated in the presence of acute dacryocystitis. Other tests which may be carried out are the lacrimal system scintigraphy, which may help in the diagnosis of these cases of functional, and not anatomical disorders[13]. Eventually, a CT scan may be ordered in order to assess neighboring structures (anterior orbit, paranasal sinuses, etc.). Nasolacrimal duct obstructions was confirmed by syringing where resistance to saline flow and regurgitation from opposite punctum was seen and simultaneously patients underwent a standard rigid nasal endoscopy to rule out septal deviation and any additional nasal or sinus pathologic conditions. Informed consent was obtained in every patient. Surgery was carried out by 0 degree nasal endoscope (4 mm). In this procedure, we restore the flow of tear into the nose from lacrimal sac when nasolacrimal duct does not function**.** When we did nasal endoscopy, we found deviated nasal septum in 16cases so simultaneously endoscopic DCR with septoplasty was done.

Then we taken regularly every patient for follow up at one week, 3rd week, 6th week and 3rd month. In this study surgical outcome measures by resolution of epiphora, absences of discharge and patency of ostium which is confirmed by sac syringing and endoscopic evaluation of neoostium

III. RESULTS

100 cases of chronic dacryocystitis were operated by endoscopic endonasal DCR over period of 2 years. Most common presenting symptom in chronic dacryocystitis was epiphora which was almost 100% in our study.

Table 1Symptomology of CDC

Presenting symptoms	n(%)
Epiphora only	52(52)
Epiphora with discharge	28(28)
Epiphora with swelling	12(12)
Others	8(8)

n- number of patients

Table 2 Presenting age group in chronic dacryocystitis

Age group	N(%)
<10 year	8
11-20 years	8

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21-30 years	12
31-40 years	44
41-50 years	16
51-60 years	12

n- number of patients

Majority (44 out of 100) of the patients were presented of chronic dacryocystitis in age group of 31–40 year with female dominance (52%). 20 out of 100 cases were in age group of 41- 50 year . Least common presenting age was in the paediatric age group. In this study slightly left side higher incidence were present.

Table 3 lateralty and gender incidence of chronic dacryocystitis.

Incidence	N(%)
Laterality	
Right	48(48)
Left	52(52)
Gender incidence	
Male	44(44)
Female	56(56)

n- number of patients

The outcome of endoscopic DCR operation for each eye was categorised into complete cured, partial cured or no improvement according to degree of symptomatic relief following the operation.

Table 4 Cure Rate of operated case of Endoscopic DCR

Cure rate	n(%)
Completely cured	96(96)
Partially Cured	3(3)
Failure	1(1)

n- number of patients

Among 100 cases, 96 were completely cured which measured by resolution of epiphora, absences of discharge from punctum and patency of neo-ostium which was confirmed by sac syringing and postoperative nasal endoscopic evaluation of neo-osteum. 4 patients had partially improvement or no improvement in operated cases of endoscopic DCR because those has not come in regular follow up and some had nasal abnormality other problem. Also Endoscopic dacryocystorhinostomy has failed due to synechiae formation followed by granulation. Success rate is different in hands of experienced and inexperienced hands

IV. DISCUSSION

Endonasal DCR is far superior than external DCR reason is simple and obvious[14]. Most of patients are females so if in any way a scar can be prevented over face will be a better option[15]. Females have significantly smaller dimensions in the lower nasolacrimal fossa and middle nasolacrimal duct. Hormonal changes that bring about a generalized de-epithelization in the body may cause the same within the lacrimal sac and duct. An already narrow lacrimal fossa in women predispose them to obstruction by the sloughed off debris [16]. Morever an injudicious use of kaajal and adulterated cosmetics applied on the wrong side of eyelashes can also play important role in obstruction of nasolacrimal system. Female to male ratio advocated in one study recently was 10:1 in a study of 800 DCR cases [15]. Anatomical variation of sac is dependent on anatomy of lateral wall of nose which is the sole reason of direct visualization under endoscopic guidance helps in achieving 100% success. Adequate removal of bone during procedure is the only root for success for surgery. In follow up patient should be strictly instructed to clear nose proper by using buffered saline solution to clear crusts/clots overlying endonasal sac ostia.

V. CONCLUSIONS

Endoscopic endonasal DCR is gaining grounds in recent era because of comparable success rate, no skin scar, less tissue dissection,

less intraoperative hemorrhage and decrease postoperative morbidity. So that endoscopic DCR technique is much more to treat the disorder of lacrimal system successfully. Endoscopic endonasal dacryocystorhinostomy is preferred technique and best surgical management of chronic dacryocystitis with nasolacrimal duct obstruction.

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Declaration of Competing Interest
The authors have no conflicts of interest to disclose.

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