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Study the demographic, clinical and surgical outcomes of endoscopic dacryocystorhinostomy

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***Abstract*---**Background & Method: This study was done with an aim to study the demographic, clinical and surgical outcomes of Endoscopic Dacryocystorhinostomy. The records of patients who underwent Endoscopic DCR in the last five years were retrieved from the archival records of Department of Otorhinolaryngology and Head-Neck Surgery, K.G.M.U and were reviewed for demographic data, laterality, pre-operative complaints, co-morbidities, clinical and surgical profiles, adjunctive procedures, complications, and success rates at the last follow up. Result: The distribution of cases according to operation type is shown in table-7. Among the cases, Endoscopic DCR Left operation was performed in 94 (41.6%) cases while Endoscopic DCR Right operation was performed in 131 (58.0%) cases. There was one case operated with Endoscopic Bilateral DCR. On comparing pre to post op tearing status, it was found that at pre op the mean tearing score was 5.80±2.02 which was reduced to 1.17±1.35 at post op. So a mean reduction of 4.63±0.12 was observed which was significant statistically ($p<0.001$). Conclusion: Endoscopic DCR can be adopted the first-line surgical procedure for the treatment of acquired Nasolacrimal duct obstruction. Endoscopic DCR avoids external scar, endoscopic visualization and assessment can be done immediately with correction of pathology including endonasal pathologies (DNS, turbinate hypertrophy etc.). Disadvantages of endoscopic DCR include need for expensive instruments, difficult

learning technique and difficulty in suturing nasal and lacrimal flaps. With advancement in instrumentation and modifications technique, the possibility of success rates of endoscopic DCR appears to be comparable to the 'Gold Standard' external DCR with success rate ranging from 80-95% in various studies study. As in our study it was 87%.

***Keywords*---**demographic, surgical, endoscopic, dacryocystorhinostomy.

Introduction

The lacrimal apparatus is a well-connected anatomical structure that is situated within the orbit that is responsible for the production and drainage of tears. The secretory functions of the lacrimal apparatus are finely controlled by the autonomic nervous system. The sympathetic fibers arise from the carotid plexus, while the parasympathetic fibers originate from neurons of the superior salivatory nucleus in the brainstem.[1] Tearing develops when there is a gross imbalance between production of tears and drainage function of lacrimal system.[2] Hyper secretion (lacrimation) is excessive tearing caused by reflex hyper secretion due to irritation of the cornea or conjunctiva e.g. trigeminal nerve stimulation in corneal disease.

Epiphora occurs with poor lacrimal drainage due to-

- Mechanical obstruction of the lacrimal drainage system resulting from trauma, dacryocystolithiasis, sinusitis, and congenital nasolacrimal duct obstruction.
- Lacrimal pump failure (functional epiphora) can be attributed to eyelid laxity (as in facial nerve palsy), eyelid malposition or evenpunctum eversion.

The majority of nasolacrimal system obstruction is unknown. Idiopathic obstruction is seen more frequently with increasing age and exhibits a female preponderance. Surgical/ facial trauma, granulomatous conditions such as Wegener's granulomatosis and sarcoidosis, malignancy, infections, and radiation exposure can be regarded as the less common causes.[3] Dacrocystorhinostomy (DCR) is performed to alleviateepiphora resulting from an obstruction of the lacrimal apparatus[4]. It should be noted that while a significant number of patients suffer nasolacrimal injury after FESS (up to 15%), actual obstruction resulting in epiphora is very rare[5].

Material & Method

After obtaining approval from medical ethical committee (Ref code 97th ECM II B-Thesis/p79) of King George Medical University, the study was conducted in the Department of Otorhinolaryngology and Head-Neck Surgery, King George's Medical University, Lucknow for One Year.

Inclusion Criteria

• All operated patients of chronic dacryocystitis who had undergone Endoscopic DCR**.**

Exclusion Criteria

• Patients not willing to take part in study**.**

Study Sample

All the cases of chronic dacryocystitis who were admitted and operated via Endoscopic DCR in the last five years (2015-2019). A total of 315 Endoscopic DCR cases were performed in our institution in the last five years, and out of which 226 patients consented to participate in the study.

Methodology

The records of patients who underwent Endoscopic DCR in the last five years were retrieved from the archival records of Department of Otorhinolaryngology and Head-Neck Surgery, K.G.M.U and were reviewed for demographic data, laterality, pre-operative complaints, co-morbidities, clinical and surgical profiles, adjunctive procedures, complications, and success rates at the last follow up. Anatomical success was defined as patent ostium on irrigation and functional success as free flow of normal saline into theostium on lacrimal syringing (per op and post op) and resolution of epiphora. These patients were contacted telephonically and called for follow-up on OPD basis. Those who agreed to visit OPD were presented with questionnaires (GBI questionnaires and NLDO-SS) and the data was recorded and further analyzed and compared. As for the remaining patients who were unwilling for an OPD visit, questionnaires were presented telephonically and the answers recorded for further analysis.

The symptoms of the patients were evaluated using the Nasolacrimal Duct Obstruction Symptom Score (NLDO-SS) questionnaire. The NLDO-SS questionnaire is a suitable and validated tool for subjective postoperative outcome assessment after an Endo-DCR procedure. It consists of eight items: five items focused on the common ocular symptoms of NLD obstruction; two items describing the conditions in the nasal cavity; and one general condition. The symptoms were graded using an 11-point numeric rating scale (from 0 being for Nosymptom to 10 being for worst imaginable symptom). The total score for the NLDO-SS ranges from 0 to 80 points.

Results

Table – 1: Age Distribution of Cases

Age Group	No.	%
<=15 years	25	11.1
16 - 25 years	49	21.7
26 - 35 years	36	15.9

36 - 45 years	55	24.3
46 - 55 years	31	13.7
> 55 years	30	13.3
Total	226	100.0

The age wise distribution of cases is shown in table-1. Among the cases, maximum were within the age range 36 – 45 years with proportion 24.3%, followed by the age range 16 – 25 years with proportion 21.7%.

Table – 2: Distribution of Cases according to Unilateral/Bilateral

UNILATERAL/BILATERAL	No.	%
Unilateral	194	85.8
Bilateral	32	14.2
Total	226	100.0

The distribution of cases according to unilateral/bilateral diagnosis is shown in table-6. Among the cases, 194 (85.8%) diagnosis was unilateral and rest 32 (14.2%) diagnosis was bilateral.

Table – 3: Distribution of Cases according to Operation Type

Operation	No.	%
ENDOSCOPIC DCR LEFT	94	41.6
ENDOSCOPIC DCR RIGHT	131	58.0
ENDOSCOPIC BILATERAL DCR	1	.4
Total	226	100.0

The distribution of cases according to operation type is shown in table-7. Among the cases, Endoscopic DCR Left operation was performed in 94 (41.6%) cases while Endoscopic DCR Right operation was performed in 131 (58.0%) cases. There was one case operated with Endoscopic Bilateral DCR.

Table – 4: Pre to Post Op Comparison of Tearing

Tearing	Mean	SD	Mean Diff.	SE (Diff.)	t-value	p-value
Pre Op.	5.80	2.02	4.63	0.12	38.40	<0.001
Post Op.	1.17	1.35				

On comparing pre to post op tearing status, it was found that at pre op the mean tearing score was 5.80±2.02 which was reduced to 1.17±1.35 at post op. So a mean reduction of 4.63±0.12 was observed which was significant statistically ($p<0.001$).

Discussion

Endoscopic DCR was first explained by Caldwell in 1893, in which portion of inferior turbinate was removed & NLD was followed till lacrimal sac. It was modified by West and Halle (1914) using microscope for good Endoscopic

visualization[6]. The interest of Endoscopic approach was renewed along with the invention of rigid nasal endoscopes in the 1970s. Rice performed cadaveric surgery demonstrating endoscopic intranasal DCR in the year 1988 which was followed by review of 4 patients in 1990. The first clinical study on intranasal endoscopic DCR with the use of 300Storz Hopkins endoscope for visualization throughout surgery was published by McDonough and Meiring in the year 1989. Wormald PJ, in the year 2002, demonstrated powered endoscopic DCR with complete sac exposure & primary mucosal anastomosis. Variant of endoscopic DCR like use of stents, LASER & use of Mitomycin C have been tried in last few decade, with variable but overall good results, comparable to that of external DCR[7].

Thus although external DCR was considered as the Gold Standard treatment of NLD obstruction, but endoscopic DCR is gaining much more popularity among patients due to equal promising results, due to lack of external facial scar and without disruption of the medial palpebral ligament and the angular facial vessels. Our study aims to evaluate subjective outcomes of endoscopic DCR and changes in the quality of life after endoscopic DCR using GBI scoring system.

Classically, performing DCR is the optimum intervention. Previous studies show that DCR relieves the symptoms and improvement in quality of life of the patient. Our analysis was based on three parameters: the evaluation surgical outcome using NLDO-SS and an objective evaluation, the assessment of improvement in the quality of life of the patients using the GBI questionnaire, as well as the assessment, through a questionnaire, of the satisfaction of the patient[8]. The results showed significant improvement of the symptoms of the patients using a validated symptom score. These scoring systems provide a better quantification of the improvement in the patients and of the degree of any residual symptoms, if any. Recently, additional lacrimal symptom questionnaires have validated to provide advantage in quantification of lacrimal symptoms of patients and their impact on their social life[9]. These questionnaires should be of a great benefit for future studies with DCR, as well as in comparing the outcome after various procedures. Our results highlight improved quality of life after intervention. One of the major limitations of our study was absence of a control group consisting of patients submitted to a staged procedure. This can be attributed to the retrospective nature of our study.

A total of 315 endoscopic-DCRs were performed in our institution in the last five years of which 226 willingly participated in the study. Out of these, Unilateral 194(85.8%), Bilateral 32 (14.2 %) with 111 (49.1%) males and 115 (50.9%) were females and the mean age at surgery was 45.3 years old (range16–55 years old). There was a history of epiphora in 203 patients (90%), Recurrent dacryocystitis was also observed in 30 patient (13%). success achieved in 87% cases. This is similar and supported bythe study of Herzallah et al (2004)who conducted a total of 128 endoscopic DCRs during the study period in which 13 cases were bilateral (10.2%), with a male to female ratio of 1:2.25 and the mean age at surgery being 45.3 years old (range: 23–65 years old)[10]. There was a history of bilateral epiphora in 13 patients. Recurrent dacryocystitis was also observed in18 sides (69.2%), Postoperative success was documented in 24 out of the 26sides (92.3%). In the study of Ben Simon GJ et al (2005), one hundred and forty-three patients (48

male and 95 female; mean age, 63 years) underwent 176 DCR surgeries for acquired NLDO wherein the success rate was 76.7%(achieved in 135 cases) and failure was 23.3% (seen in 41 cases).

The clinical symptoms of NLD obstruction varied among our study patients. Some of the symptoms can be troublesome, as blurred vision and orbital pain consequent via epiphora and recurrence of dacryocystitis[11]. These symptoms can cause minor inconveniences for some individuals, but they are extremely troublesome for others and may significantly deteriorate their quality of life included tearing(90%), Discharge in the eye(62%), Swelling around eye(50%), Pain around eye(40%), Change in visual acuity(2%), Nasal blockage(20%),Nasal discharge(8%).

Conclusion

Endoscopic DCR can be adopted the first-line surgical procedure for the treatment of acquired Nasolacrimal duct obstruction. Endoscopic DCR avoids external scar, endoscopic visualization and assessment can be done immediately with correction of pathology including endonasal pathologies (DNS, turbinate hypertrophy etc.). Disadvantages of endoscopic DCR include need for expensive instruments, difficult learning technique and difficulty in suturing nasal and lacrimal flaps. With advancement in instrumentation and modifications technique, the possibility of success rates of endoscopic DCR appears to be comparable to the 'Gold Standard' external DCR with success rate ranging from 80-95% in various studies study. As in our study it was 87%.

Study Designed: Retrospective Study

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