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ORIGINAL RESEARCH

Evaluation Of The Impact Of Successful Primary Endoscopic-Endonasal DCR On The Symptoms And The Quality Of Life Of The Patients

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ABSTRACT:

Introduction: Nasolacrimal duct obstruction (NLDO) causes inflammation of the lacrimal sac known as dacryocystitis.There are various methods of performing dacryocystorhinostomy for the treatment of nasolacrimal duct obstruction but endoscopic dacryocystorhinostomy is becoming more popular, compared with conventional external dacryocystorhinostomy. Present study is planned to evaluate the improvement in symptoms and quality of life of patients after endoscopic endonasal DCR and its comparison with external DCR.

Materials and Methods: The presentstudy was conducted 60 cases that were diagnosed as nasolacrimal duct obstruction or chronic dacryocystitis.The study population was divided in three groups i.e., group I for endonasal endoscopic dacryocystorhinostomy with silicon stent, group II for endonasal endoscopic dacryocystorhinostomy without silicon stent and group III for conventional (external) DCR.During each postoperative visit the patients were asked common ocular symptoms of NLDO.

Results: 51 cases (85%) were females, and 9 cases (15%) were males. The male to female being 1: 4.45. Though the number of female patients was significantly greater than males ($p<0.01$) they were evenly distributed in two groups. Primary EN-DCR is a highly successful surgical procedure with an over all success rate of 92.5%, and external DCR has success rate of (90%) which is not significant.

Conclusion: Successful primary EN-DCR seems to have a significant positive impacton the patients' symptoms and QoL.

Keywords: Dacryocystitis;Endoscopic-Endonasal DCR; Nasolacrimal Duct Obstruction.

INTRODUCTION

Nasolacrimal duct obstruction (NLDO)causes inflammation of the lacrimal sac known as dacryocystitis. It generally affects two age groups, infants and adult females over 40 years of age. Congenital dacryocystitis is almost always chronic, while acquired dacryocystitis may be acute or chronic. Chronic dacryocystitis is the common form of dacryocystitis which arises from nasolacrimal duct occlusion. While obstruction of the nasolacrimal duct may present with epiphora, it may also present with a mucocele, pyocele or recurrent acute dacryocystitis.[1]

There are various methods of performing dacryocystorhinostomy for the treatment of nasolacrimal duct obstruction. Endoscopic dacryocystorhinostomy is becoming more popular, compared with conventional external dacryocystorhinostomy. It has gained momentum over the last decade, due to increased familiarity of otolaryngologists with the endoscopic anatomy of nasal cavity. [1,2]

The endonasal approach to the lacrimal sac was first described by Caldwell in 1893,[3] and later in 1911 by West, however, its use remained limited due to difficulties in visualizing the endonasal structures during operation. The introduction of the rigid endoscope provided the catalyst for endonasal dacryocystorhinostomy.[4]

The first cadaver study demonstrating the feasibility of endoscopic endonasal DCR was published by Rice in 1988.[5]McDonogh and Meiring published the first clinical study of endoscopic endonasal DCR in 1989.[6]The principal advantage of the endonasal technique is that it is performed endoscopically through the nose and does not require an external skin incision. Recent studies with endonasal DCR have shown success rates comparable with external DCR approaches.[7]Present study is planned to evaluate the improvement in symptoms and quality of life of patients after endoscopic endonasal DCR and its comparison with external DCR.

MATERIALS AND METHODS

The present randomized study was conducted among the patients of Chronic Dacryocystitis admitted in the Department of Otorhinolaryngology, Sardar Patel Medical College & Hospital, Bikaner over a period of 1 year. The study consisted of 60 cases that were diagnosed as nasolacrimal duct obstruction or chronic dacryocystitis and who were fulfilling inclusion criteria during the study period. Inclusion criteria comprised of patients with history of persistent watering or mucoid/mucopurulent discharge from eye, patients in whom sac syringing reveals obstruction in the lower passage with regurgitation from the other punctum, patients with mucocoele, patients with external lacrimal fistula and those who were willing to undergo surgery. Exclusion criteria comprised of patient with epiphora with no signs of lacrimal drainage obstruction on sac syringing, patient with ectropion/ entropion/ lower lid laxity, patient with canalicular and punctal obstruction, patient with post traumatic bone deformity, patient with history of radiation therapy and patients with sinonasal malignancy and granulomatous conditions.The study population was divided in three groups i.e., group I for endonasal endoscopic dacryocystorhinostomy with silicon stent, group II for endonasal endoscopic dacryocystorhinostomy without silicon stent and group III forconventional (external) DCR.

A written fully explained consent stating the voluntary participation of subjects in the study was taken before the enrollment of the subjects. All cases selected for the study were evaluated using preformed proforma. A detailed history was taken as to age, sex, socioeconomic status, occupation, nature and duration of symptoms etc. Nasolacrimal Duct Obstruction Symptom Score (NLDO-SS) questionnaire was given, and symptom score will be calculated.[8]

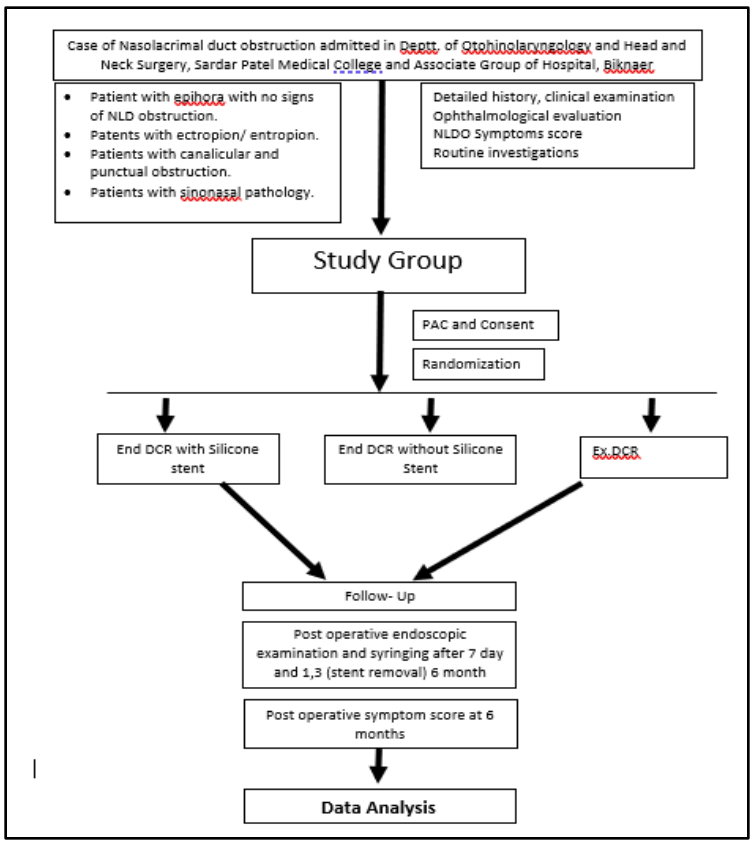
Detailed preoperative clinical examination was done. Radiological studies done like X-ray study of PNS water's view and NCCT paranasal sinuses wherever required. Routine blood investigations, urine examination, X-ray chest (PA) view, ECG will be done in all patients.Findings in the nasal cavity were assessed and scored by using the Lund-MacKay (Lund and Mackay 1993) staging system (Appendix). During the preoperative visit (Studies II-IV), all the patients filled out a Nasolacrimal Duct Obstruction Symptom Score (NLDO-SS) questionnaire and preoperative data study forms.[8] Pre-anaesthetic check-up and xylocaine sensitivity testing of all the patients were done.External infiltration was performed just below the medial canthus of the eye, in order to anaesthetize and ensure vasoconstriction at the anterior lacrimal crest and lacrimal fossa.

For post-operative assessment, Merocel nasal pack removed on 3rdpost operative day. All the patients were treated with Antibiotic eye drops (topical dexamethasone and ciprofloxacin eye-drops) given four times a day for three to four weeks in order to ensure continuous flow through the lacrimal system, and intranasal saline spray or saline nasal drops advised four to five times a day to avoid crust formation for one month. Advice to avoid nose blowing for four to seven days was given to avoid nasal hemorrhage and orbital emphysema. During the postoperative visit the rhinostoma site and middle meatus were cleaned with suction by using 0^{o} nasal endoscope in localanesthesia. Lacrimal syringing was performed in all the cases.

Endoscopic visualization of the nasal cavity performed.During each postoperative visit the patients were asked common ocular symptoms of NLDO.[9] The surgical outcome was considered successful if the saline solution freely reached the nose during the lacrimal sac irrigation and if the patients had no tearing or recurrent infection of the lacrimal sac.[10]

The data from the patients proforma compiled into Microsoft Excel 2007 spreadsheet. The open-Epi software from CDC[10] was used for statistical calculations. Differences between the two groups were assessed with the Pearson ChiSquare and Fisher's exact test. The correlations between categorical variables were assessed with Pearson's correlation coefficient. The level of statistical significance was set to 5%.

Differences were regarded as statistically significant if a two-sided *P*-value was less than 0.05. Data are expressed as the number of cases or mean with standard deviation (SD).



RESULTS

In our study of total 60 cases, 51 cases (85%) were females, and 9 cases (15%) were males (table 1). In group I, 18 cases (90%) were females and 2 cases (10%) were males, while in group II, 16 cases (80%) were females and 4 cases (20%) were males and Group III 17 cases (85%) were females and 3 cases (15%) were male.The male to female being 1:5.66.

Objective analysis was done by syringing (table 2). During the first week syringing was not done in Group I patients due to the presence of the stent. Silicone stent removed at 3 months thus at 12 weeks syringing in group I was patent in 19(95%) and non-patent in 1 case due to missing of stent knot. In group II syringing patency was seen in 18 (90%) and was non patent in 2(10%) of the cases. At 12th week, $p>0.05$. This test for objective analysis between the two groups statistically stands insignificant. *P*-value for Syringing result at 6^{th} month (1.00) explains no significant difference for syringing result in both groups.

Table 3 shows that *P*-value for symptomatic relief by EN-DCR at 4^{th}week, 12^{th} week and 6^{th} month is 1.00 showing no significant difference in symptomatic relief in between three groups. Symptomatic assessment at 1st week in group B, all the cases reporteda complete symptomatic relief (100%).At 4th week, in group I 95% cases reported complete relief. In group IIcomplete relief was reported by 90% cases *P*-value = >0.05 this test for the comparison of symptomatic assessment between the two groups statistically stands insignificant. At 12 weeks complete relief

from epiphora was reported by 19 (95%) of group I and 18(90%) of group II patients. *P*-value =>0.05. This test for subjective analysis for symptomatic relief stands statistically insignificant.
Table 4 shows comparison of outcome of Endoscopic DCR with and without silicone stents. Table 5 reveals results after 6th month Persistent watering after surgery was seen in 10 cases. In all of them syringing was negative. One patient with failure in group A had granulation tissue around the stent, we found granulation in 5 cases at the rhinostomy site, and stenosis at stoma site in 4 cases (6.67%) rhinostomal opening was seen in two cases which led to failure and in another patient, there was fibrosis at the rhinostomal opening which led to failure.
Overall success rate was 91.67%. Though the success rate of Group I was (95%) better than Group II (90%), Group III (90%) it was not statistically significant. (*P*-value= 0.5)

Table1: Distribution of cases according to Sex

Sex	**Group I (n=20) (With silicon stent) No of cases (%)**	**Group II (n=20) (Without silicon stent) No of cases (%)**	**Group III (n=20) External dacrosystorhinostomy No of cases (%)**	**Total of cases**
Male	2	4	3	9 (15%)
Female	18	16	17	51 (85%)
	20	20	20	60

Table 2: Comparison of Objective analysis by syringing results between two groups

Syringing results (Objective analysis)	**Group I (n=20) (With silicon stent) No of cases (%)**	**Group II (n=20) (Without silicon stent) No of cases (%)**	**Group III (n=20) External dacrosystorhinostomy No of cases (%)**
Patency at 4th week	-	19	19
Patency at 12th week	19	18	18
Patency at 6th Months	19	18	18
$\chi 2 = 0.00$P value=1.00			

Table 3: Comparison of Post-operative Symptomatic relief between two groups (Subjective assessment).

Post-operative Symptomatic relief	**Group I (n=20) (With silicon stent) No of cases (%)**	**Group II (n=20) (Without silicon stent) No of cases (%)**	**Group III (n=20) External dacrosystorhinostomy No of cases (%)**
Complete relief at 4th week	20	19	19
Complete relief at 12th week	19	18	18
Complete relief at 6th Months	19	18	18
$\chi 2 = =0.000$P value=1.00			

Table 4: Comparison of outcome of Endoscopic DCR with and without silicone stents

	Group I (n=30) (With silicone stent) No of cases (%)	Group II (n=30) (Without silicone stent) No of cases (%)	Group III (n=20) External dacrosystorhinostomy No of cases (%)
Clinical features			
Epiphora	1	2	2
Lacrimal sac swelling	-	-	1
Nasal endoscopy			
Granulations	2	3	-
Stenosis	1	1	-
Syringing/symptomatic relief at 6th month			
Free flow of saline	19	18	18
Obstruction/ regurgitation	1	2	2

Table 5: Results after 6th month

Group	Objective analysis		Subjective assessment	
	Patent	**Non patent**	**Relieved**	**Non Relieved**
Group I	19	1	19	1
Group II	18	2	18	2
Group III	18	2	18	2

DISCUSSION

We studied 60 cases presented with epiphora out of which, 51 cases (85%) were females, and 9 cases(15%) were males. The sex ratio of male to female being 1:5.66. Though the number of female patients was significantly greater than males (p<0.01) they were evenly distributed in two groups.In a study Sonkhyaet al[4] studied 226 cases of NLD obstruction; out of those 179 were female (79 per cent) and 47 male (21 per cent). The youngest patient was an eight-year-old girl and the eldest a 74-year-old woman. The main presenting complaint was epiphora (95 per cent); this included cases presenting with purulent discharge at the medial canthus (21 per cent), mucocele (13 per cent) and lacrimal fistula (3 per cent).

From the technical perspective, several investigators described their experience with variations in terms of removal of bone or soft tissue, and theuse of stents during surgery. Javateet al[11]noted a successrate of 98% in 117 patients who underwent EDCR using radiofrequency instrumentation for mucosa removal, followed by mitomycin C application(0.5 mg/mL for 3 minutes), followed by placement of a double stent.Cokkeser et al[12] reported success in 87% of 62 patientswho underwent bone removal with a hammer and chisel technique. Ibrahim et al[13] described their experience with an endoscopically guided trephination procedure and reported success in 83% of 19 patients in their study. We found free flow of normal saline in 37 out of 40 cases (92.5%). Persistent watering after surgery was seen in 3 cases. In all

of them syringing was negative. We found granulation in 5 cases at the rhinostomy site and stenosis at stoma site in 3 cases. Though the success rate of Group I was (95%) better than Group II (90%), it was not statistically significant.

The creation of nasal or lacrimal sac mucosal flaps was reported by several investigators in recent years. WormaldPJ et al[7] found success rates of 95.7% and 91% in patients who underwent EDCR with nasal and lacrimal sac flaps.Masseguret al[14] reported success in 93% of patients who underwent hammer and chisel EDCR in conjunction with lacrimal sac and posteriorly based nasal mucosal flaps.

The studies evaluating the effect of silicon tubes after EN-DCR have shown considerable inconsistency. There are studies that demonstrate favorable effects of silicone tubing, such as the prevention of the obliteration of the rhinostomy site, leading to more successful EN-DCR.[15]On the other hand, other studies have reported that the omission of silicone tubes does not increase the risk of obliteration.[16,17]

In our study the success rate of EN DCR with silicone stenting is 95%. Complete symptomatic relief was seen in 19 (95%) cases, & 1(5%) reported nosymptomatic relief. Aslan Set al[18] in their study of 42 eyes with prolene stent reported asuccess rate of 92.9%. They reported that the results were very good in 81%, as goodin 11.9% and no change in 7.1%. which is similar to our results with silicone stenting.

Many variations of endoscopic dacryocystorhinostomy with little modificationslike the use of stents, laser and Mitomycin-C have been described in the last decade,with equally good results. A bicanalicular silicone tube is the stent most often used inDCR procedures to prevent obliteration of the rhinostomy opening after DCR.Several prognostic factors may affect the outcome of primary EN-DCR. Önerciet al[19] demonstrated that EN-DCR is a relatively infrequent operation, with an obvious learning curve. Thus, experience plays an important role in the success of the procedure.

A history of chronic or recurrent sinusitis, or additional nasal surgery at the same time with EN-DCR, has been shown to increase the risk of EN-DCR failure.[20]In the present study, we adhered to the recommendation to clean the rhinostomy site one week after operation[4,7,21]and performed the local irrigation of the nasal cavity with saline spray[16] and antibiotic-steroid eye drops for two weeks postoperatively.[22]

In the present study, primary EN-DCR was found to result in marked improvements in QoL and in symptoms related to obstruction of the nasolacrimal duct in both the groups. Our finding supports those of previous studies. reporting a positive impact on QoL related to EN-DCR.[23,24]Our study indicates that successful primary EN-DCR has a significant impact on the patients' QoL, and the health benefits improved significantly up to six months after operation.

CONCLUSION

Primary EN-DCR is a highly successful surgical procedure with an overall success rate of 92.5%, and external DCR has success rate of (90%) which is not significant. Successful primary EN-DCR seems to have a significant positive impacton the patients' symptoms and QoL.

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