Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/95hmxe55

A COMPARATIVE STUDY OF EXTERNAL VERSUS ENDOSCOPIC DACRYOCYSTORHINOSTOMY

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ABSTRACT

Purpose: To compare external versus endoscopic dacryocystorhinostomy.

Methods: In this prospective, randomized interventional study, total 100 patients (50 patients in each group) were enrolled as per exclusion and inclusion criteria for 1 year 6 months of study duration. Patients were randomized into two groups- Group I: 50 patients who were undergo external dacryocystorhinostomy (by one of the two surgeons) and Group II: 50 patients who were undergo endoscopic endonasal.

Statistical analysis: It was performed using SPSS software (SPSS Inc., Chicago, IL, USA) for Windows program (21.0 version).

Results: Among the both group majority of pt. were between 41-70 yr. In both the groups, females were predominant. The success rate of external DCR (98%) in this study was slightly higher than endoscopic DCR (94%) but was statistically non – significant.

Conclusion: The difference between endoscopic and external DCR was not statistically significant. We concluded that these two distinct dacryocystorhinostomy methods are viable alternatives.

Keywords: External dacryocystorhinostomy, Nasolacrimal duct obstruction, Endonasal dacryocystorhinostomy.

Introduction

Dacryocystorhinostomy (DCR) is the gold standard for treating individuals with acquired nasolacrimal duct obstruction.**1** NLDO manifests as epiphora, swelling over sac area, regurgitation positive and Dacryocystitis. It can be performed externally (EXT) or endoscopically (END). The reported success rates for this procedure range between 80% and 95% in the literature. External DCR has several advantages over endoscopic DCR, including direct visualization of the lacrimal sac, absence of expensive instrumentation, and the ability to form and suture flaps between the lacrimal sac and nasal mucosa. The latter is the primary reason for the increased success rate when compared to endoscopic DCR. External DCR has concern of medial canthal scar and disruption of the orbicularis, which may result in an irregular tear pump, as well as greater postoperative morbidity due to the skin incision. **2**

The advantages of the endonasal technique include the absence of surgical scarring and a lower rate of skin infections, ectropion, and medial canthal ligament damage.

The purpose of this study is to compare external and endoscopic dacryocystorhinostomy in order to demonstrate the efficacy of both methods.

Aim and Objective:

Aim

To compare the study of external versus endoscopic dacryocystorhinostomy.

Objectives

1. To study the outcome of external dacryocystorhinostomy.
2. To study the outcome of endoscopic endonasal dacryocystorhinostomy.
3. To compare the outcome of external dacryocystorhinostomy with that of endoscopic endonasal dacryocystorhinostomy.

Materials and Methods:

After obtaining the Institutional Ethics Committee approval of our institution, this prospective, randomised interventional study was conducted on 100 patients who attended the ophthalmology and the ENT outpatient departments diagnosed for primary acquired nasolacrimal duct obstruction or chronic Dacryocystis. This study was conducted in 1 year and 6 months. These 100 patients were divided into 2 groups (Group I and Group II) of 50 patients each. Group I patients were undergone external dacryocystorhinostomy with silicon tube whereas in group II endoscopic dacryocystorhinostomy was performed.

Patients with any canalicular and punctal obstruction, lacrimal pump insufficiency, any previous history of sac surgery, or any nasal pathology where dacryocystorhinostomy is not advisable were excluded from our study.

Statistical Analysis

Statistical analysis was performed using SPSS software (SPSS Inc., Chicago, IL, USA) for Windows program (21.0 version). A Chi-square test was used to find the significance of study parameters on a categorical scale. The continuous variables were evaluated by mean (standard deviation) or range value when required. The dichotomous variables were presented in number/frequency. To compare the means between the two groups, analysis by Student t-test. A p-value of < 0.05 or 0.001 was regarded as significant.

Table-1: Tabular distribution of age of study population among different groups.

AGE	GROUP-I		GROUP-II		P-VALUE
	N	%	N	%	
18-40	15	30.00%	17	34.00%	X=4.688 p=0.0960
41-70	35	70.00%	29	58.00%	
>70	0	0.00%	4	8.00%	
Grand Total	**50**	**100.00%**	**50**	**100.00%**	
MEAN±SD	48.04±11.82		48.08±12.99		

Table-2: Tabular distribution of Gender of study population among different groups.

GENDER	GROUP-I		GROUP-II		P-VALUE
	N	%	N	%	
Female	45	90.00%	50	100.00%	X=5.263 **p=0.0218***
Male	5	10.00%	0	0.00%	
Grand Total	**50**	**100.00%**	**50**	**100.00%**	

Table-3: Success rate of study population among different groups.

	Group – I	Group – II
Success rate	**98%**	**94%**

Table-4: Epiphora in study population among different groups at Different Follow-ups.

FOLLOW-UP					
EPIPHORA	**GROUP-I**		**GROUP-II**		**P-VALUE**
	PRESENT	**ABSENT**	**PRESENT**	**ABSENT**	
DAY 1	0	50	0	50	X=11.73 P=0.9828
1 WK	0	50	0	50	
2 WK	0	50	0	50	
4 WK	1	49	2	48	
8 WK	1	49	2	48	
12 WK	1	49	2	48	
16 WK	1	49	3	47	
20 WK	1	49	3	47	
24 WK	1	49	3	47	

Table-5: Syringing in study population among different groups at different Follow-ups.

FOLLOW-UP					
SYRINGING	**GROUP-I**		**GROUP-II**		**P-VALUE**
	PATENT	**NON - PATENT**	**PATENT**	**NON - PATENT**	
DAY 1	50	0	50	0	X=11.73 P=0.9828
1 WK	50	0	50	0	
2 WK	50	0	50	0	
4 WK	49	1	48	2	
8 WK	49	1	48	2	
12 WK	49	1	48	2	
16 WK	49	1	47	3	
20 WK	49	1	47	3	
24 WK	49	1	47	3	

Results

This Prospective, randomized, and interventional study was conducted into two groups- Group I: 50 patients who underwent external dacryocystorhinostomy (by one of the two surgeons) and Group II: 50 patients who underwent endoscopic endonasal. Patients were comparable to each other in terms of age-wise distribution (table 1). Among both groups, majority of pt. were between 41-70 yr. and statically no significant difference was observed(p-0.0960). In both the groups, females were predominant. (table 2). The statistically significant difference was observed[p=0.0218*] between the Gender distribution among both groups.

In group-I out of 50 patients, 1(2%) patient had Fibrosed SAC condition during surgery. whereas, in group-II, 2 (4%) patients had Fibrosed SAC condition during surgery. Statistically a non-significant difference was observed[p=0.5577] in the SAC condition of enrolled patients' eye among both groups at Intra-op.

The success rate of external DCR (98%) in this study was slightly higher than endoscopic DCR (94%) but was statistically non – significant (table 3). In group – I, 1 patient had early tube fall out of nasal cavity (at 1 week) which further showed symptom of epiphora (table 4) and syringing (table 5) was found non patent (at 4 weeks) and ultimately required reinterventions**.** In group – II, 2 patients had granulation at ostium (found in nasal endoscopy at 4 weeks) and 1 patient had nasal synechiae formation (found in nasal endoscopy at 8 weeks) which further showed symptom of epiphora (table 4), and non-patent syringing (table 5) and they required reintervention.

Discussion

Dacryocystorhinostomy is a continuously evolving procedure and many of its aspects are being actively investigated in order to establish a preferred approach. Although the success rate of endoscopic DCR was found to be slightly lower than the success rate of external approach, both external and endoscopic DCR are performed on a regular basis worldwide. 48, 49, 50

In the present prospective, randomized, and interventional study patients was randomized into two groups- Group I: 50 patients who were undergo external dacryocystorhinostomy and Group II: 50 patients who were undergo endoscopic endonasal. The mean age of the both groups were 48.04±11.82 and 48.08±12.99 and were comparable. Among both group majority of the patients were of age between 41-70 years followed by 18-40 year and statistically non-significant difference. Majority of the patients were female as compared to male [p=0.0218*]. Majority In group-I out of 50 patients, 1(2%) patient had found Fibrosed SAC condition during surgery. whereas, in group-II, 2 (4%) patients had Fibrosed SAC condition found during surgery. Silicon tube was used on all the patients in Group-I. All patients in group-II had no orbital injuries at all.

In group- I, no patient showed epiphora till 2 weeks although, after 2 weeks 1(2%) patient showed epiphora from 4 weeks onwards at each follow-up Whereas in group II no patient showed epiphora uptill 2 weeks, although 2 patients showed epiphora from 4 weeks onward which increased to 3 patients from 16 weeks. Statistically a non-significant difference was observed [p=0.9828]

In both the groups all patient's syringing was found patent up to 2 weeks.In group- I 1(2%) patient showed non patent syringing from 4 weeks whereas in group II 2(4%) patients had non patent syringing from 4 weeks which increased to 3 from 16 weeks. Statistically non-significant (p=0.9828) difference was observed

In group-I, 1(2.00%) patient required Reintervention. However, in group-II, 3(6.00%) patients required Reintervention.

Okuyucu et al. and Semsettin et al. report that endoscopic and external DCR have a negative effect on nasal mucociliary clearance function; those effects might be due to post-operative oedema and the continuous washing effect of the lacrimal fluid through the neo-ostium. Nonetheless, the influence of these procedures on nasal airflow has yet to be studied [50, 54].

Quality of life evaluation after DCR is traditionally performed by the Glasgow questionnaire that assesses the effect of an intervention on the health status of patients [56]. Here, an inventory of nasal and eye symptoms was used in order to specifically evaluate the quality of life in a relevant context. A bimodal improvement in quality of life was observed after both endoscopic and external DCR: The first after the operation, and the second after stent removal.

Joshi et al., 2014 [61] prospective, non-randomized study done on 80 eyes of 72 patients presented with epiphora or chronic dacryocystitis. In their study, female to male ratio was 2.69:1. This shows that the nasolacrimal sac and duct obstruction is more common in females than males. This result corroborates with previous studies. [62-63] Similar to above studies finding, we also found female dominancy as compared to male. he also found that average time required for endoscopic DCR was 49 minutes as compared to external DCR was 119.6 minutes. They found that surgical times are closely related to the surgical experience of the surgeon and intraoperative bleeding. Similarly, we also observed most of the endoscopic DCR procedure time of < 1 hrs as compared to external DCR. Moreover, selected surgeon performed DCR make this observation more reliable.

Complication rate was low in both types of surgery. Complication of excessive intraoperative bleeding occurred in external and endoscopic DCR was 10 (33.3%) and five (10%) cases, respectively. This finding corroborates with study done by **Moras et al. [63]**

The primary surgical success rate in endoscopic DCR group was 90% and 96.7% in external DCR group after 1st month of follow-up period. In endoscopic DCR group, all five (10%) of patients with persistent obstruction of neo-ostium subsequently underwent revision procedures. At 6 month of follow–up, 46 (92%) out of 50 cases ultimately had a successful surgical outcome in endoscopic DCR compared to external DCR which showed 28 (93.3%) out of 30 cases a successful outcome. This difference was not statistically significant (P = 0.609). Similarly, in Exo-group-I, only 8% patients

underwent Reintervention as compared to 16% in Endo-group-II. Although, here we also found no statistically significant difference.

The success rate for endoscopic DCR appears to be comparable to the "gold standard" external approach, with success rate ranging from 78% to 97%. [24,25]. In **Joshi et al., 2014 [61], success** rate in both group is comparable to various studies. **Khan et al.,** showed that success rate was 73.3% with endoscopic approach and 80% with external approach.[59]

Only two surgeons were responsible for both dacryocystorhinostomy methods, was the strength of the present study. However, author recommended further multicentric study with large sample size to increase the reliability and generalizability of the present study findings. **Conclusion**: Dacryocystorhinostomy is the preferred treatment for Chronic Dacryocystitis. The difference between endoscopic and external DCR was not statistically significant. Both the external and endonasal techniques have benefits and drawbacks. In both cases, the incidence of complications is modest. In external DCR, however, success rates are modestly greater, but endoscopic DCR provides the significant advantages of no external scarring and early post-operative rehabilitation. The choice of surgical approach should be determined by the patient's preference, the availability of resources, and the surgeon's skill, with the patient informed of the benefits and drawbacks of each option.

Thus, we concluded that these two distinct dacryocystorhinostomy methods are viable alternatives. External and endonasal DCR were also equally effective based on patency of passage. Although, scar-free procedure of endoscopic DCR might be more advantageous.

Limitations of the Study

- A larger sample size and multicentric study with high precision and accuracy may be recommended for more reliable interpretation of the data
- Additionally, the study needs long term follow up to determine the success rate between ext. and endo DCR.

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