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Functional Evaluation after Transnasal Endoscopic Dacryocystorhinostomyat Zagazig University Hospital

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The chronic form of dacryocystitis is associated with chronic tearing, lacrimal drainage system thickening, and accumulation of germs. It is a constant threat to the cornea and orbital tissue. Endoscopic Dacryocystorhinostomy (DCR) is accepted technique for the management of nasolacrimal obstruction which allows the direct drainage of tears from the lacrimal sac into the nasal cavity so epiphoraalleviation.This study is aimed to evaluate the functional results and success rate of endoscopic dacryocystorhinostomy for management of patients with nasolacrimal duct obstruction. A prospective interventional consisted of 20 patients with nasolacrimal system obstruction for more than 1 year and fit for general anasthesia, underwent endoscopic DCR. Before surgery, patient were underwent Full history taking, Complete physical examination, Anterior rhinoscopy, Nasal symptoms score, Routine laboratory investigations, Rhinological examination and Lacrimal drainage tests. The patients were followed up for 6 months after surgery then undergoing epiphora tests, nasal symptoms score for functional evaluation of endoscopic DCR.The mean age of the studied group was (26.9±9.1) ranged from (8-38) years and (90.0%) of them were females. Before surgery, all patients (100.0%) had epiphora, (15.0%) had mild nasal obstruction, (85.0%) didn't have nasal obstruction and no one had sneezing, nasal itching or rhinorrhea. it was pus in 17/20 cases (85.0%) and retained secretion in (15.0%). There was statistically significant improvement in epiophra post-operatively and statistically significant difference in nasal obstruction during the follow up period, statistically significant increase in nasal symptoms score postoperatively than preoperatively (0.15±0.36) versus (1.6±1.2) respectively.Endoscopic DCR is a minimally invasive and quick procedure, with a low perioperative complication rate and a similar success percentage, yielding results comparable to classic DCR.

Keywords: Dacryocystorhinostomy, Epiphora and proximal bicanalicular obstruction

INTRODUCTION

Obstruction of the nasolacrimal duct leads to stagnation of tears and mucous secretion in the lacrimal sac and the lacrimal drainage system which ends with dacryocystitis with clinical presentations include pain, redness, swelling over the inner side of the lower eyelid, and epiphora with or without purulent discharge (Bharathi et al. 2008). The etiology of nasolacrimal duct obstruction may be primary idiopathic stenosis, usually in elder female and middle age. It may be secondary, related to a malformation of the tear duct, injury, eye infection, neoplasm, or trauma. However, simple stenosis with epiphora may be tolerable by a large number of patients for many years. (Mills et al.2007).The chronic form of dacryocystitis is associated with chronic tearing, thickening of the lacrimal drainage system, and accumulation of germs, usually the majority of patients harbor multiple microorganisms. It is a constant threat to the cornea and orbital tissue. Complications of dacryocystitis include fistula, corneal ulcer, and orbital cellulitis; moreover, it causes social embarrassment due to long-lasting

epiphora (Kebede et al. 2010).

Chronic dacryocystitis is almost always managed surgically with high success rates. Probing is accepted as first-line management in chronic cases and can be done in the outpatient setting. Inevitably, patients will likely need to progress to further surgical options to treat the condition. Balloon dacryoplasty, nasolacrimal intubation, and nasolacrimal stenting have all been attempted with variable first-time success rates. If these therapies fail, evaluation for percutaneous dacryocystorhinostomy (DCR) or endoscopic dacryocystorhinostomy is then pursued(Magomedov, et al. 2018). This study is aimed to evaluate the functional results and success rate of endoscopic dacryocystorhinostomy for management of patients with nasolacrimal duct obstruction.

MATERIALS AND METHODS

A prospective interventional consisted of 20 patients with nasolacrimal system obstruction for more than 1 year and fit for general anasthesia, underwent endoscopic DCR conducted on ENT department, Faculty of Medicine, Zagazig University.

Ethics Committee approval, all patients were informed and consented for the surgery. The patients were followed up for 6 months after surgery then undergoing endoscopic examination, epiphora tests, nasal symptoms score for functional evaluation of endoscopic DCR.

Inclusion and exclusion criteria:

Patients with Idiopathic chronic dacryocystitis over one year were included in this study. While, exclusion criteria were pre-saccal obstruction, previous nasolacrimal surgery, malignancy in the paranasal sinuses, nasal cavity, or lacrimal pathway, mental disability, pregnancy or breast feeding.

1. Preoperative preparation:

All patients were undergoing for full history complete physical examination, Anteriorrhinoscopy, Nasal symptoms score, Routine laboratory investigations, Rhinological examination and Lacrimal drainage tests.

2. Operative procedure:

All patients received 2% xylocain with 1:10.000 adrenaline solution in a cotton wads 30 minutes before the operation to provide topical decongestion and haemostasis. All procedures were done under general anaesthesia, with hypotensive technique. Head ofthe patients were raised 30 degrees upwards and turned to the right of the patient towards the surgeon. High endoscopic approach septoplasty may be performed to create adequate potential space in anterior superior nasal cavity to facilitate our surgery. The 1.5×2 cm piece of mucosa anterior to the anterior attachment of middle turbinate dissected off but posteriorly based after incision with sickle knife. The lacrimal sac then opened vertically using sickle knife, while the sac is tented (critical point) by probe because clear tenting of the medial wall of the sac by probe means that the probe entered successfully through the common canaliculus into the lacrimal sac. Patency checked by saline irrigation via inferior canaliculus and flow through the nasal cavity through the new stoma is visualized endoscopicaly. All patients were stented with silicone stent.

3-Postoperative Follow up for 6 months:

The nasal pack was removed after 24 hours. All patients received systemic antibiotics, analgesics, antibiotic and steroid eye drops and local nasal decongestant, nasal steroid spray and saline nasal irrigation. All patients were regularly followed during the next six months, every week in the first month, and every month in the next five months. Nasal endoscopy with saline syringing to remove crustation, granulations and secretions.

All patients underwent nasal symptom score. The silicon stents removed from 2 to 3 months after the operation. All patients were assessed postoperatively subjectively and objectively (flourescein test and irrigation test) as regard resolution of epiphora after one month, and after six months.

Statistical analysis:

Data were analyzed using IBM SPSS 23.0 for windows (SPSS Inc., Chicago, IL, USA) and NCSS 11for windows (NCSS LCC., Kaysville, UT, USA). Quantitative data were expressed as mean± standard deviation (SD), Quantitative data were tested for normality using KolomogrovSmirnove test, assuming normality at $P>0.05$. Qualitative data were expressed as frequency and percentage.

RESULTSAND DISCUSSION

This study included 20 cases undergoing endoscopic Dacrycystorhinostomy (DCR) for nasolacrimal duct obstruction. the age of the studied group was (26.9±9.1) ranged from (8-38) years and (90.0%) of them were females (Table

1). Table (2) showed that (100.0%) of the studied group had Propping hard stop and Delayed FDDT. There were (70.0%) of the studied group had left endoscopic DCR (table 3) and (85.0%) of the studied group had pus and (15.0%) had retained secretion (table 4)

Table 1: Age and sex distribution of the studied group:

Variable	The studied group(20) mean ± SD (Range) median	
Age (years):	26.9±9.1 (8-38) 27	
Variable	**NO(20)**	**%**
Sex: Male Female	2 18	10.0% 90.0%

Table 2: Lacrimal drainage tests among the studied group:

Lacrimal drainage tests	NO(20)	%
Propping hard stop		
Yes	20	100.0%
No	0.0	0.00%
Delayed FDDT		
Yes	20	100.0%
No	0.0	0.00%

Table 3: Operation type among the studied group:

Variable	NO(20)	%
Operation type		
Right endoscopic DCR	**6**	**30.0%**
Left endoscopic DCR	**14**	**70.0%**

Table 4: Type of pathology among the studied group:

Variables	NO(20)	%
Pus	**17**	**85.0%**
Retained secretion	**3**	**15.0%**

Our result showed that (100.0%) of the studied group had posterior flap, silicon stent which removed from all cases after 3 months and (100.0%) had gel foam and sofratalle packing (table 5), (20.0%) of the studied group had nasal septal deviation while (100.0%) didn't have anatomical variations(Figure 1). (90.0%) of the studied group didn't have complications, while only one patient (5.0%) had synachiae& infection and another one (5.0%) had nasal polyp (table 6). The success rate among the studied group was 90.0% (figure 2).

Table (5):Flap type, stent used and packing type among the studied group:

Variables	NO(20)	%
Flap type Posterior	20	100.0%
Stent used Silicon for 3 months only	20	100.0%
Packing type Gel foam &sofratalle	20	100.0%

Regarding nasal symptoms and Epiophra among the studied group, there was statistically significant improvement in epiophra post-operatively and there was statistically significant difference in nasal obstruction during the follow up period. although there was no statistically significant difference in the studied group during the six months follow up period (Table 7). Regarding nasal symptoms score among the studied group, there was statistically significant difference in nasal symptoms score pre and postoperatively (Table 8).

The primary causes of lacrimal pathway obstruction include acute or chronic inflammation, trauma, or congenital malformations. Patients generally present with epiphora, eyelid and lacrimal sac swelling, purulent secretion, blurred vision, and facial pain. Dacryocystitis and recurrent conjunctivitis are typical. (Saleem, 2019). Dacryocystorhinostomy (DCR) surgery is the standard procedure for nasolacrimal duct obstruction treatment that aims to eliminate fluid and mucus retention within the lacrimal sac, and to increase tear drainage for relief of epiphora (water running down the face). A DCR procedure involves removal of bone adjacent to the nasolacrimal sac and incorporating the lacrimal sac with the lateral nasal mucosa in order to bypass the nasolacrimal duct obstruction. This allows tears to drain directly into the nasal cavity from the canaliculi via a new low-resistance pathway (Henson, 2018).

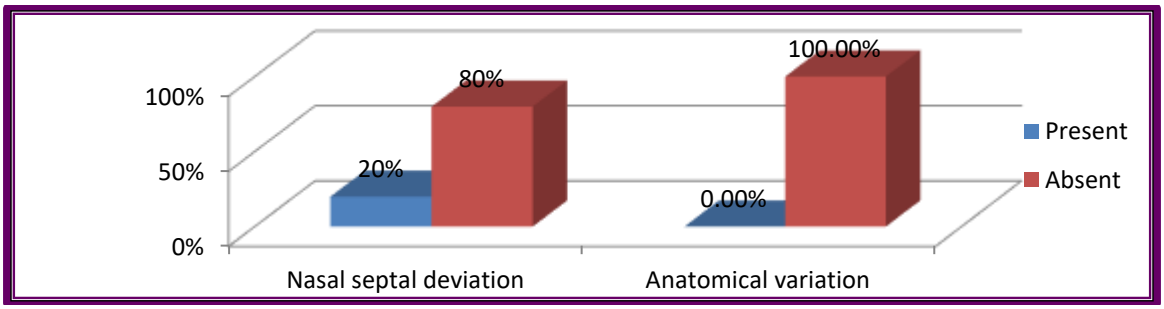

Figure 1: Bar chart for preoperative nasal endoscopic examination among the studied group

Table 6: Postoperative complications in the study group:

Postoperative complications	NO(20)	%
No complications	18	90.0%
Lt side synachiae& infection	1	5.0%
Nasal polyp	1	5.0%

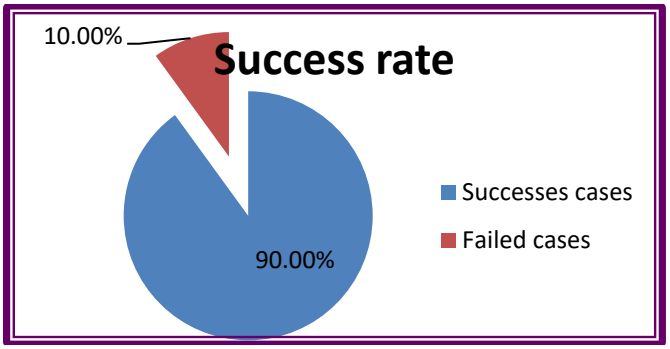

Figure 2: Pie chart for the success rate in the case group

Table 7: Comparing pre and postoperative nasal symptoms and Epiophra among the studied group:

Variable	Preoperative No (%)	1month Postoperative No (%)	3months Postoperative No (%)	6months Postoperative No (%)	p-value!
Rhinorrhea					
No	20 (100.0%)	20 (100.0%)	20 (100.0%)	20 (100.0%)	1
Yes	0.0 (0.00%)	0.0 (0.00%)	0.0 (0.00%)	0.0 (0.00%)	
Nasal itching					
No	20 (100.0%)	20 (100.0%)	20 (100.0%)	20 (100.0%)	1
Yes	0.0 (0.00%)	0.0 (0.00%)	0.0 (0.00%)	0.0 (0.00%)	
Nasal obstruction					
No	17 (85.0%)	6 (30.0%)	8 (40.0%)	16 (80.0%)	0.03*
Mild	3.0 (15.0%)	6 (30.0%)	7 (35.0%)	4 (20.0%)	
Moderate	0.0 (0.00%)	8 (40.0%)	5(25.0%)	0.0(0.00%)	
Sneezing					
No	20 (100.0%)	9 (45.0%)	12 (60.0%)	18 (90.0%)	0.7
Yes	0.0 (0.00%)	11 (55.0%)	8 (40.0%)	2 (10.0%)	
Epiophra					
No	0.0 (0.00%)	20 (100.0%)	20 (100.0%)	20 (100.0%)	0.001**
Yes	20 (100.0%)	0.0 (0.00%)	0.0 (0.00%)	0.0 (0.00%)	

*Statistically significant difference (P ≤ 0.05).
**Statistically highly significant difference (P ≤ 0.001).

Table 8: Comparing pre and postoperative nasal symptoms score among the studied group:

Variable	preoperative (20) mean ± SD Range		postoperative (20) mean ± SD Range	Paired t- test	p
Nasal symptoms score	0.15±0.36 (0.0-1)		1.6±1.2 (0.0-3)	2.8	0.003*
Variable	**Preoperative F(20) %**		**postoperative F (20) %**	**X^2**	**p**
Nasal symptoms score:					
Zero	17	85.0	315.0	6.9	0.001**
One	3	15.0	945.0		
Three	0.0	0.00	840.0		

*Statistically significant difference (P ≤ 0.05).

**Statistically highly significant difference (P ≤ 0.001).

Pre-operative diagnosis of associated nasal disorders (i.e. obstructive deviation of the nasal septum, nasal conchae hypertrophy, synechia, polyps, chronic rhinosinusitis, and others) are needed with concurrent intraoperative treatment of these disorders when present. Postoperative care must be carried out until complete healing is achieved and the lacrimal pathway is patent and working (Ali &Kaynak 2018). The complication rate of endoscopic dacryocystorhinostomy (DCR) in experienced hands was never higher than 2%. The most important complications stem from the surgeon losing sight of the anatomical landmarks during the procedure, with consequent damage to neighboring structures. More frequently, the dissection is extended too posteriorly, damaging the drainage of the maxillary and frontal sinuses. Orbit penetration, with exposure of the orbital fat, bleeding and damage to the eye muscles may also happen. The key anatomical landmark used to avoid such complications is the unciformapophysis. it must be spotted early on during the procedure and represents the posterior limit for the dissection. (Ben et al.2012). The aim of the current study was to evaluate the success rate of endoscopic dacryocystorhinostomy for management of patients with nasolacrimal duct obstruction assessing the functional results of endoscopic dacrycystorhinostomy as regard lacrimal secretion.

This interventional study included 20 cases undergoing endoscopic Dacrycystorhinostomy (DCR) for nasolacrimal duct obstruction. The mean age of the studied group was (26.9±9.1) ranged from (8-38) years and (90.0%) of them were females , this was in agreement with a study conducted by (Dulku et al. 2012) where (73%) of the study group were females.

Epiphora was left sided in (70.0%) of the case group and right sided in (30.0%) the cases undergoing endoscopic DCR within the affected side. The all studied group (100.0%) had positivepropping hard stop and delayed FDDT as lacrimal drainage tests for preoperative evaluation.The twenty patients had posterior flap during the procedure, silicon stent which removed from all cases after 3 months and had gel foam &sofratalle packing. This silicon stent explantation time was similar to the silicon stent explantation time made in a study conducted by Taşkıranwith average 4.3 months (Taşkıran et al. 2014). Regarding pathology of fluid, it was pus in 17/20 cases (85.0%) and retained secretion in (15.0%). Concerning preoperative symptoms in our study, all patients (100.0%) had epiphora, (15.0%) had mild nasal obstruction, (85.0%) didn't have nasal obstruction and no one had sneezing, nasal itching or rhinorrhea. Our study had a success rate (90.0%) was similar to Taşkıran et al. 2014 whose success rate was (89.1%), Also Kaynak et al. 2014in their recent article evaluating the success rate of dacryocystorhinostomy (DCR) with a follow-up time of 24.29 months reported that, at the third month follow-up, 85.4% of cases had complete resolution of their symptoms. However, the functional success rate decreased to 67.7% at 6 months, to 63.3% at 1 year, and to 60.3% at 2 years, while the patency of the lacrimal drainage system was restored in 93.1%, 74.6%, 69.5%, and 68.2% of the cases, respectively due to postoperative complication Adhesion ,synachiae and neo-ostium unstable . Our current study showed statistically significant improvement in epiophra post-operatively and there was statistically significant difference in nasal obstruction during the follow up period. But regarding other symptoms (sneezing, nasal itching and rhinorrhea), there was no statistically significant difference in the studied group during the six months follow up period. This was in contrast with Taşkıran et al. 2014 Whose study

reported early epiphora in 7 (20.5%) patients after explantation of the silicon stent. Regarding nasal symptoms score, there was statistically significant increase in nasal symptoms score postoperatively than preoperatively (0.15±0.36) versus (1.6±1.2) respectively.

CONCLUSION

Endoscopic DCR is a minimally invasive and quick procedure, with a low perioperative complication rate and a similar success percentage, yielding results comparable to classic DCR. Comparative studies with more patients and longer follow-up times should be planned to assess the difference between endoscopic and external approach. Further studies need to evaluate the cost effectiveness of this approach in a prospective randomized fashion.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

AUTHOR CONTRIBUTIONS

All author contributed in all parts of the paper.

REFERENCES

Ali MJ &Kaynak P (2018).Conjunctivodacryocystorhinostomy: Indications, Techniques, and Complications. In Principles and Practice of Lacrimal Surgery (pp. 291-302). Springer, Singapore.

Ben J, Brown C &McNab A (2012). Larger osteotomies result in larger ostia in external dacryocystorhinostomies. Arch Facial Plast Surg.; 14 (2):127-31.

Bharathi MJ, Ramakrishnan R, Maneksha V, Shivakumar C, Nithya V, Mittal S (2008). Comparative bacteriology of acute and chronic dacryocystitis. Eye 22:953–960 Epub 2007 Jun 29.

Dulku S, Akinmade A &Durrani OM (2012).Postoperative infection rate after dacryocystorhinostomy without the use of systemic antibiotic prophylaxis. Orbit, 31(1), 44-47.

Henson RPD (2018).Primary Endocanalicular Laser Dacryocystorhinostomy. In Principles and Practice of Lacrimal Surgery (pp. 239-251). Springer, Singapore.

Kaynak P, Ozturker C, Yazgan S, Karabulut O, Akar S, Demirok A, Yilmaz F (2014). Transcanalicular diode laser assisted dacryocystorhinostomy in primary acquired nasolacrimal duct obstruction: 2-year follow up. OphthalPlastReconstrSurg; 30(1): 28–33.

Kebede A, Adamu Y, Bejiga A (2010). Bacteriological study of dacryocystitis among patients attending in Menelik II Hospital, Addis Ababa, Ethiopia. Ethiop Med J 48(1):29–339.

Magomedov MM, Borisova OY, Bakharev AV, Lapchenko AA, Magomedova NM, Gadua NT (2018). [The multidisciplinary approach to the diagnostics and surgical treatment of the lacrimal passages].Vestn.Otorinolaringol. 2018;83(3):88-93.

Mills DM, Bodman MG, Meyer DR, Morton AD (2007). The microbiologic spectrum of dacryocystitis: a national study of acute versus chronic infection. OphthalPlastReconstrSurg 23(4):302–306.

Saleem AA (2019). Congenital Nasolacrimal Duct Obstruction and the Visual System.In Frontiers in Ophthalmology and Ocular Imaging.Intech Open.

Taşkıran A, Karadağ O, Arıkan S, Gencer B & Kara S (2014). Comparison of transcanalicular diode laser dacryocystorhinostomy and external dacryocystorhinostomy in patients with primary acquired nasolacrimal duct obstruction. Lasers in surgery and medicine; 46(4), 275-280.