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BILATERAL SIMULTANEOUS ENDO DCR : IS IT FEASIBLE?

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ABSTRACT

INTRODUCTION: Bilateral simultaneous endoscopic dacryocystorhinostomy (endo DCR) is rarely performed by surgeons, partly due to traditional teaching of performing surgery on one side first followed by the other after few months, partly due to fear of failure and imparing the patient's daily activity caused by bilateral nasal surgery. Hence vast majority of surgeons continue to perform endo DCR in a staged manner, repairing one side followed by the other after few months

OBJECTIVE : To evaluate the results of simultaneous bilateral Endo-DCR and its impact on the quality of life of the patients.

METHODS : We have conducted a retrospective analysis of patients who underwent bilateral simultaneous endo-DCR between Jan 2018 and Dec 2018 at our tertiary care hospital. The reviewed data included clinical presentation; operative details; success rate; pre and postoperative evaluation of the symptoms of the patients, using the Nasolacrimal Duct Obstruction Symptom Score Questionnaire; comparison of complications with cases undergoing only unilateral endo-DCR.

RESULTS: A total of 30 cases were bilateral (60 sides). Postoperative success was documented in 56 of the 60 sides (93.33%), with a mean follow-up duration of 18 months. Four failed sides were reported where both sides failed in same patient, while the remaining 2 were in 2 separate cases. For Bilateral Endo-DCR the preoperative symptom score was 38.5±4.22(mean±SD) and postoperative symptom score was 4.23±1.67 which was significantly lower (mean±SD). In Unilateral Endo-DCR the preoperative symptom score was 35.9±10.9(mean±SD) and postoperative symptom score was 4.46±1.78 which was significantly lower (mean±SD). The success rates in unilateral and bilateral cases were comparable, with no statistically significant difference. No significant difference was seen in complication rates between bilateral and unilateral cases.

CONCLUSION: Our results support that a simultaneous bilateral endo-DCR is a safe procedure that offers a high success rate, spares the patient from the stress of a second surgery, provides the patient with a bilateral resolution of the symptoms, and has no significant increase in complications.

KEYWORDS

dacryocystorhinostomy, epiphora, dacryocystitis, nasolacrimal duct, lacrimal sac, endoscopic DCR

INTRODUCTION

Epiphora is a common complaint. For some this is a minor inconvenience, but for others it can be extremely troublesome and a source of social embarrassment. While obstruction of nasolacrimal system may present with epiphora, it may also present with a mucocoele, pyocoele or recurrent acute dacryocystitis. The incidence of nasolacrimal obstruction is estimated to involve approximately 10% at 40 years increasing to 35 to 40% at 90 years of age [1].

The definitive treatment of NLD obstruction is dacryocyst orhinostomy (DCR), a relatively old surgical procedure that aims to bypass the obstruction by creating a new permanent canal between the lacrimal sac and the nasal cavity [2,3]. Originally, there are two different approaches to DCR: external, via skin incision, and an endoscopic approach (endo-DCR). In the last few years, endo-DCR has become the procedure of choice, since it has many advantages, including good aesthetic result, lack of external scars, preservation of the pumping mechanism of the orbicularis oculi muscle, and shorter operative time, with an overall success rate between 87 and 95% [4,5,6].

Although NLD obstruction can affect the lacrimal drainage systems of both eyes in some patients [7], it has been an established approach to perform two DCRs in separate settings to bypass one obstruction at a time [8]. Instead of that, a simultaneous procedure has been considered by some surgeons to correct both sides in the same operation [8,9].

Any surgery is a cause of significant stress to a human being, both physically and mentally. Not only the body undergoes various physiological changes during and after surgery, the patient is also under mental duress due to physical duress, sometimes combined with loss of wages due to leave taken for surgery, family readjustments and so on. In the experience of this tertiary care hospital, where the study was undertaken, a lot of patients have in the past shown interest in undergoing both sides of nasolacrimal surgery simultaneously, to minimise physical and mental stress as well as decreased amount of leave to be taken at place of work. The purpose of our retrospective study was to report our experience of performing a bilateral endo-DCR in one sitting, and to document its outcome, including complications, when compared to patients undergoing unilateral endo DCR.

MATERIALS AND METHODS

PATIENTS AND STUDY DESIGN

All the patients undergoing endoscopic dacryocystorhinostomy (endo DCR) at our hospital between 1st January, 2018 to 31st December, 2018 were analysed in this study. Patients having revision procedure were excluded. The patients undergoing simultaneous bilateral endo DCR were analysed further.The study was approved by the ethical committee board of our hospital.

The medical records of the patients have been reviewed for demographic data, etiology of NLD obstruction, medical history, duration of surgery, postoperative improvement, incidence of postoperative complications, hospitalization, duration of follow-up, as well as questionnaires to assess the satisfaction of the patients with the bilateral simultaneous procedure and the improvement in their quality of life.

Preoperative Assessment

Before surgery, all the patients underwent an evaluation of their symptoms and as well as a clinical examination both in the rhinology and ophthalmology departments to confirm bilateral NLD obstruction and the need for DCR on both sides. Irrigation, probing, and nasoendoscopy were performed on all the patients The operative procedure, the postoperative risks and complications were all explained to the patients and written informed consents were taken.

The symptoms of the patients were evaluated using the Nasolacrimal Duct Obstruction Symptom Score (NLDO-SS) questionnaire [9,10].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 item on the general condition (Table 1). The symptoms are graded using an 11-point numeric rating scale (0=no symptom, 10=worst imaginable symptom). The total score for the NLDO-SS ranges from 0 to 80 points.

Table 1

Nasolacrimal Duct Obstruction Symptom Score (NLDO-SS)	
Symptom	Score
Tearing	0-10
Discharge in the eye	0-10
Swelling around the eye	0-10
Pain around the eye	0-10
Change in visual acuity	0-10
Nose blockage	0-10
Nasal cavity discharge	0-10
General condition	0-10
Total Score	0-80

Numeric rating scale: 0=no symptom; 10=worst imaginable symptom

Surgical Technique

All operations were performed under local anesthesia. The endo-DCR was performed using a standard surgical technique. A U-shaped mucosal incision was performed to elevate a posteriorly based mucosal flap and to expose the bony covering of the lacrimal sac. The anterior part of the uncinate process, which is a frontal process of the maxilla that forms the thick anteromedial wall of the lacrimal sac, and the lacrimal bone were both removed to create a bony opening and to expose the medial surface of the sac. The removal of thick bones was performed using a set of Kerrison rongeurs and curettes (Karl Storz, Tuttlingen, Germany), without the need of drilling in any of the cases included in the study. A probe was inserted through the upper or lower punctum and then through the common canaliculus into the lacrimal sac to tent its medial wall. A vertical incision was then performed in the medial wall of the lacrimal sac, followed by horizontal incisions superiorly and inferiorly to create lacrimal sac flaps in an open-book fashion. The lacrimal probe was ensured to pass smoothly through the common canaliculus. The mucosal flap was then trimmed and carefully placed in close opposition to the edges of the lacrimal sac flaps to allow healing by primary intention. A silicone stent was placed if narrowing or granulation tissue was observed around the opening of the common canaliculus [11].

The patients were seen postoperatively weekly for the first month, then biweekly for 3 months and 6 monthly thereafter. The outcome was evaluated both on the basis of resolution of the symptoms of the patients (as assessed by the NLDO-SS questionnaire), as well as by confirming DCR patency during an endoscopic endonasal examination or irrigation testing. Only if there was both resolution of symptoms as well as patency of the surgical site, was the surgery considered as successful.

Complications of the surgery were documented under the following criteria

- Scarring or granulation at site of rhinostomy
- Adhesions between traumatised nasal surfaces
- Migration of the stent and cheese wiring
- Sump syndrome
- Haemorrhage
- Infection
- Peri orbital bruising
- Endophthalmitis

STATISTICALANALYSIS

Data were entered into a database and analyzed using SPSS software (SPSS, Windows, version 16). The p-value was set at <0.05 as significant. Chi- square test was used to compare results between pre-operative and post-operative status. Comparson of complication between two groups done by Chi Square test.

RESULTS

A total of 57 endoDCR were performed during the study period at our institute, of which 30 were bilateral (52.63%), with a male to female ratio of 1:2(10 males, 20 females), and the mean age at surgery was 46.5 years old (range: 23–65 years old). There was a history of epiphora in all the 60 sides of the 30 patients. Recurrent dacryocystitis was also observed in 20 sides (33.3%). The total duration of the surgery ranged between 50 minutes and 180 minutes (mean: 115 minutes). Silicone stents were used in 10 sides. The decision to insert a silicon stent was made if there was stenosis of, or granulation tissue around, the common canaliculus.

The complication rates were as follows

- Granuloma formation/scarring at rhinostomy site – 4 out of 60 (6.66%)
- Adhesions between traumatised nasal surfaces -3 (5%)
- Migration of stent and cheese wiring—1 out of 10 (10%)
- Sump syndrome – 0 (0%)
- Intra/post operative haemorrhage—2 (3.33%)
- Infection – 1 (1.66%)
- Perorbital bruising – 0 (0%)
- Endophthalmitis – 0 (0%)

Postoperative success was documented in 56 out of 60 sides (93.33%) with a mean follow up time of 18 months (range: 6–36 months). All of the successful cases had resolution of both their epiphora and chronic dacryocystitis, in addition to patent DCR opening during the endoscopic endonasal examination. Of the 4 failed sides, 2 were reported in the same patient (both sides failed in same patient) and the remaining 2 were in 2 separate patients. 2 of the sides failed due to granulation tissue formation and the remaining 2 due to scarring. The preoperative symptom scores of the patients for each side ranged between 12 and 80 (38.5±4.22), with no significant difference in the symptom score between the right and left sides (p =0.7). The postoperative symptom scores ranged between 0 and 60 due to the presence of 4 failed sides (4.23±1.67). A reduction in the symptom scores of the patients was reported for each of the eight symptoms, with a significant decrease in the total score (p < 0.001) (Table 2).

Table 2 Results of the preoperative and postoperative symptom score of the patients

	Pre op (mean)	Post op (mean)	p value
Epiphora	9.01	0.68	<0.0001
Discharge	5.08	0.30	<0.0001
Swelling	6.53	1.01	<0.0001
Pain	7.03	0.91	<0.0001
Change in vision	1.5	0.16	<0.0001
Nasal blockade	2.71	0.20	<0.0001
Nasal discharge	2.01	0.50	<0.0001
General condition	4.6	0.45	<0.0001
Total	38.5	4.23	<0.001

We compared these results to the outcomes in our series of 90 unilateral endo-DCRs performed during the same study period. A successful outcome was reported in 85 patients (94.4%), with no significant difference compared with the bilateral group (p =0.7789). The mean preoperative total symptom score in the unilateral cases was 35.9±10.9, which significantly decreased postoperatively to 4.46±1.78 (p <0.000). No significant difference was found between the bilateral and unilateral Endo-DCR groups in the total symptom scores, neither pre- or postoperatively (p >0.05).

Next we compared the complication rates between the unilateral and bilateral groups, as shown in table 3.

Table 3

	Bilateral endo DCR	Unilateral endo DCR	p value
Granuloma formation/scarring at rhinostomy site	6.66.%	7.77%	0.7982
Adhesions between nasal surfaces	5%	4.44%	0.8744
Migration or cheese wiring of stent	10%	20%	0.5040
Sump syndrome	0%	2.22%	0.2450
Haemorrhage	3.33%	5.55%	0.5273
Infection at surgical site	1.66%	2.22%	0.8118
Periorbital bruising	0%	1.11%	0.4127
Endophthalmitis	0%	1.11%	0.4127

We found no difference in complication rates between the patients undergoing bilateral simultaneous endo DCR and those who had only unilateral endo DCR.

DISCUSSION

Nasolacrimal duct (NLD) obstruction is a common clinical problem that is caused by a variety of acquired and congenital etiologies affecting the lacrimal drainage system. Typical symptoms include epiphora and recurrent dacryocystitis [12]. Endoscopic DCR as a viable option may be indicated on primary basis or as revisional surgery. Success rates for Endoscopic DCR is debatable but is an excellent upcoming option for both doctors and patients.

Previous studies indicate that DCR relieves the symptoms and improves the quality of life of the patients [13,14,15]. However, this goal cannot be achieved in patients with bilateral NLD obstruction undergoing one DCR at a time, no matter how successful the surgery is, and the patients can remain unsatisfied because of the persistent annoying symptoms in the unoperated eye, until the other surgery is performed. Moreover in a developing country like ours, where resources allotted to health care are few and daily wage loss is a significant factor, performing surgery on both sides simultaneously provides significant relief to the patient in a short time.

Our analysis was based on two parameters: the assessment of the surgical outcome using both the NLDO-SS and an objective evaluation and the assessment of the complications arising in patients undergoing simultaneous procedure. The results confirmed the significant improvement of the symptoms of the patients using a validated symptom score. These scoring systems provide a better quantification of the improvement of the patients and of the degree of any residual symptoms, if any [11].

The success rate in the present study was 93.3%, which is in line with those reported in previous studies with primary endo-DCR, [17] and is also comparable to the 94.4% success rate in our series of unilateral cases. The various complications arising during the surgeries also have shown comparability between the unilateral and the bilateral group Therefore, it appears that the bilateral simultaneous procedure does not have a negative effect on the surgical outcome [16].

The intraoperative complications of endo-DCR may include orbital injury hematoma in the lamina papyracea, and even endophthalmitis [17]. Nevertheless, both endoscopic sinus surgery and DCR can be complicated by orbital injuries [18,19] and yet, endoscopic sinus surgery is performed bilaterally whenever indicated. Therefore, it is reasonable to consider a bilateral endo-DCR whenever necessary. Indeed, studies including simultaneous bilateral external DCRs have also been performed with no reports of unfavorable complication rates [8]. Although none of our patients suffered intraoperative ophthalmic injuries, Herzallah et al suggest that the staging of the procedure be considered intraoperatively in the event of ophthalmic injury while operating the first side, in order to avoid potential bilateral visual complications, which may include corneal injury during manipulations, or inadvertent orbital penetration with fat exposure in the surgical field, which could be potentially contaminated by purulent contents of the chronically inflamed lacrimal sac [11].

One of the limitations of the present study is the absence of a control group consisting of patients submitted to a staged procedure, owing to the retrospective nature of the study. Another limitation of the present study is the small sample size attributed to the already low incidence of bilateral disease, which is also seen as a limitation in the recent studies on bilateral DCR [8,20,21].

CONCLUSION

Simultaneous bilateral endo-DCR appears to be safe, with a high success rate, sparing patients from the stress of a second surgery, with no difference in complication rates when compared to patients undergoing unilateral endo DCR.

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