

## Original Research Article

# Role of silicone stenting in endoscopic dacryocystorhinostomy

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### ABSTRACT

**Background:** Dacryocystorhinostomy (DCR) is a surgical procedure performed to relief nasolacrimal duct obstruction, which involves the creation of ostium at the lacrimal bone to form a shunt in the nasolacrimal pathway. Closure of the rhinostomy opening was considered a major factor for surgical failure. Use of silicone stent in endoscopic DCR to improve the success rate of the operation have been tried by many surgeons. In this study we assess the success rates of endoscopic DCR with and without silicone stents.

**Methods:** Prospective study includes 30 patients were operated in the Department of ENT, Misrata Medical Center, from April 2017 to March 2018. They underwent endonasal endoscopic DCR for primary acquired nasolacrimal duct obstruction. These patients were randomly divided in two groups: A and B with 15 patients in each group. The group A patients underwent endoscopic DCR with silicone stent and group B patients underwent endoscopic DCR without stent. The results were statistically analyzed by chi-square test.

**Results:** 30 patients were included in this study, their age ranged from 17 to 60 years, complaining of epiphora, 24 (80%) were females and 6 (20%) were males. The success rate was higher in patients with silicone stent (93.33%) as compared to patients without silicone stent (86.67%) but this difference in the results is not statistically significant (As p value is 0.542 which is >0.05).

**Conclusions:** Endoscopic DCR is safe, successful procedure for treatment of nasolacrimal duct obstruction and there was no significant difference in the success rates of performing endonasal DCR with silicone or without silicone stents.

**Keywords:** Endonasal dacryocystorhinostomy, Epiphora, Lacrimal stents

### INTRODUCTION

Dacryocystorhinostomy (DCR) is an operation done to improve epiphora by creating a new pathway from connecting lacrimal sac with the nasal cavity, this is can be done by external approach or internal approach. Intranasal DCR was first described by Caldwell.<sup>1</sup> In 1989, Mc Donogh et al described the endoscopic trans nasal DCR.<sup>2</sup>

Endonasal DCR has been widely used because its significant advantages, which include avoidance of facial

scarring, skin infections, ectropion, or disruption of the medial canthal ligament.<sup>3</sup> Shorter operative and lower postoperative recovery time.<sup>4,5</sup>

Other advantages for endonasal DCR in that the surgeon can do another nasal procedures at same time of the operation such as septoplasty, turbinate surgery.<sup>6,7</sup> Disadvantages of the endonasal approach such as difficulty of learn, expensive instruments compared with an external approach.<sup>8</sup>

Closure of the rhinostomy opening was considered a major factor for surgical failure.

Using of silicone stenting represent a routine step in the DCR operation by many of surgeons.<sup>9</sup> The function of the stent is thought to be useful in keeping the neo-ostium patent in the initial stages of healing and thus decreasing the chance of early failure.

This study aimed to compare the success rates of endoscopic DCR with and without silicone stents.

## **METHODS**

Prospective study includes 30 patients admitted to the Department of ENT, Misrata Medical Center over a period of one year from April 2017 to March 2018. They underwent endoscopic endonasal dacryocystorhinostomy for primary acquired nasolacrimal duct obstruction. Patients were informed about the study protocol before surgery, and a written, informed statement consent were obtained from all participating patients.

The exclusion criteria include any patient with other nasal problem or pathology that may need intervention at same time of operation. These patients were randomly divided in two groups, A and B with 15 patients in each group. The group A patients underwent endoscopic DCR with silicone stent while group B patients underwent endoscopic DCR without stent. All patients were referred from ophthalmologists as a case of epiphora due to the nasolacrimal duct obstruction and was confirmed by us by lacrimal irrigation. Nasal endoscopic examination was done for all patients preoperatively to detect any intranasal abnormalities such as nasal septum deviation, nasal polyps and synechia.

Surgical outcome was evaluated postoperatively by subjective improvement of epiphora and objectively by endoscopic examination and irrigation test to see the patency of neo-ostium.

### **Ethical approval**

All ethical approvals were obtained from Misurata medical center's (MMC) ethical committee.

### **Operative technique**

In all patients, surgery was performed under general anesthesia. The patient was placed in a supine position with the head elevated 15 degrees. After shrinkage of the nasal mucosa with a packing gauze soaked in a mixture of one ampoule adrenaline and 5 cc saline, the mucosa of the lateral nasal wall anterior to attachment of middle turbinate is infiltrated with 1:100,000 adrenaline, xylocaine solution. A 4 mm diameter, zero-degree endoscope was used

The first incision is horizontal and starting just above and anterior to the axilla of middle turbinate and moving about 1 cm anterior over the lateral nasal wall. Following that another transverse incision was made lower and

parallel to the first incision at the 2/3 of middle turbinate height. Finally, a vertical incision was made to connect the two anterior ends of the horizontal lines.

Mucosal flap is then elevated over the frontal process of maxilla and lacrimal bone. The lacrimal bone was removed by Kerrison punch forceps. The lacrimal sac then incised with sickle knife, and the exposed medial wall of the sac removed.

Irrigation with normal saline using cannula through upper and lower Puncta, to assess the patency of lacrimal pathway. Bicanalicular silicone tubes were inserted in Group A, and the free ends were tied together inside the nose. The mucosal flap was repositioned and supported with gelfoam. Nasal packing was used only if there is bleeding.

### **Postoperative care**

Patients were discharged on the second postoperative day. They were instructed to avoid blowing their noses or doing vigorous physical activities for 10 days.

Oral antibiotics (amoxicillin or clavulanic acid) were prescribed for 7 days, and xylometazoline nasal drops for 5 days and oral analgesia. Nasal irrigation with saline were recommend to prevent crust formation. Steroid nasal spray was initiated two weeks after surgery for one month.

The first postoperative follow-up was after one week. The operated site is endoscopically visualized and any debris or crusts were gently removed. Then a regular follow-up was done at 2nd week, 1<sup>st</sup> month, 3<sup>rd</sup> and 6<sup>th</sup> month.

During the follow-ups nasal cavity was inspected and the patency of the tract was checked by syringing. Silicone stents in Group A were removed after three months post operatively.

### **Statistical analyses**

Collected data were analyzed using the IBM SPSS Statistics for Windows, Released 2017, Version 25.0. Continuous data is expressed as (mean±SD) or median (interquartile range (IQR)). Comparisons between data were done by using the t-test, Mann-Whitney rank sum test, or Chi-squared test. In our study p value is 0.542 which is >0.05, and that means it is not significant.

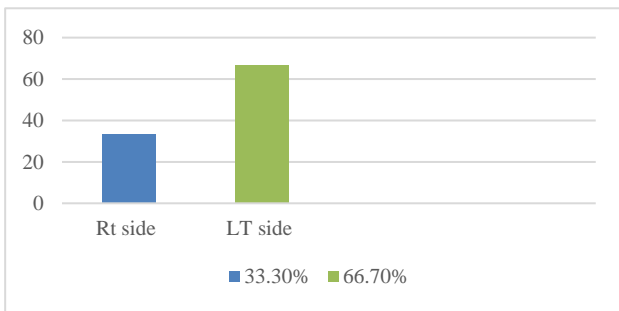
## **RESULTS**

Thirty patients were included in the study. Their age ranged from 17-60 years, with mean age of 39.8 years (Table 1). Most of the patients were in the age range of 31 to 40 years. There were 24 (80%) females and 6 (20%) males. The most common complaint of patients before surgery was epiphora. Left side is more affected than

right side: 20 (66.7%) and 10 (33.3%) respectively (Figure 1). Bilateral involvement was not seen. 14 patients from group A (93.33%) and 13 patients from group B (86.66%) were completely improved, symptom free, and patent ostium on nasal endoscopy and irrigation (Table 2). P value was calculated and it is 0.542 which is >0.05, and that means it is not significant.

**Table 1: Age and sex distribution.**

Age group (in years)	Male	Female
11-20	-	1
21-30	2	2
31-40	3	9
41-50	-	7
51-60	1	5
<b>Total</b>	<b>6</b>	<b>24</b>



**Figure 1: Laterality.**

**Table 2: Surgical outcome in the two groups.**

Group	Surgical success	Surgical failure
	N (%)	N (%)
<b>Group A (n=15)</b>	14 (93.33)	1 (6.67)
<b>Group B (n=15)</b>	13 (86.66)	2 (13.34)

There were no any significant intraoperative complications observed in our study. Nasal packing was only required for two patients (6.66%), one from group A and other from group B, which was removed after 24 hours.

**Table 3: Post-operative complications.**

Complication	Group A	Group B
<b>Bleeding</b>	1	1
<b>Oedema</b>	3	2

Postoperative oedema in medial canthus region was seen in 5 patients, 3 among group A and 2 among group B, and was treated conservatively (Table 3).

One patient in group A (6.67%) and two patients in group B (13.34%) had epiphora postoperatively. The neo-ostium was closed due to intranasal synechiae in the case

of group A and in the group B one patient had stomal closure (membranous obstruction) and the other one had intranasal synechiae.

**DISCUSSION**

Many surgeons believed that using of silicone stent during endoscopic DCR maintain the patency of the ostium during the post-operative period and healing process. Silicone intubation get its popularity since Gibbs described a technique of inserting a silicone rubber tube when performing DCR.<sup>10</sup>

Vishwakarma et al performed a prospective study on 272 patients to assess the effect of silicone stenting in the outcome of endoscopic dacryocystorhinostomy, and they find a higher success rate by using a silicone stent.<sup>11</sup> Allen and Berlin reported that silicone intubation at the time of DCR operation was associated with a statistically significant increase in the failure rate of primary DCR.<sup>12</sup>

In our study, the success rate was higher in patients with silicone stent (93.33%) as compared to patients without silicone stent (86.67%) but this difference in the results is not statistically significant (as p value is 0.542 which is >0.05).

Similar results were reported by Hardik et al, Shashidhar et al, and Yadav et al, as they found no significant difference in surgical success between DCR done with stents and those done without stents.<sup>13-15</sup>

Generally, newly created stoma closure, granulation tissue formation, and synechia are known to be closely associated with endoscopic DCR failure.<sup>16,17</sup>

In our study the cause of failure was due to intranasal synechiae in the case of group A, and in the group B one patient had stomal closure (membranous obstruction) and the other one had intranasal synechiae.

Recent studies demonstrated that silicone stent itself would be a reason for surgical failure as well as complications such as punctual erosion and splitting of canaliculi.<sup>12-19</sup>

There were no any significant complications related to the use of silicone stent in this study, except some patients got mild postoperative discomfort in medial canthus, which disappear by time.

There were no any serious intraoperative or postoperative complications encountered in this study. There was minor intraoperative bleeding which was usually self-limiting and nasal packing was only required for two patients (6.66%), one from group A and other from group B. Some patients got mild postoperative oedema in medial canthus region, which was treated conservatively.

## CONCLUSION

Endoscopic DCR is safe, successful procedure for the treatment of nasolacrimal duct obstruction. There was no significant difference in the success rates in performing endonasal DCR with silicone stenting or without stenting. Silicon stenting slightly increased the success rate of the operation. However further researches on other population is recommended.

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