Original Article

Endoscopic Dacryocystorhinostomy With And Without Silicone Intubation: A Retrospective Study On Surgical Outcomes

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Abstract

Objective: To evaluate the effects of silicon stent intubation versus no intubation in endoscopic dacryocystorhinostomy (EnDCR).

Methods: A Comparative Study Design was conducted in the ENT Department, Tertiary care hospital, Abbottabad, January 2022–August 2023. The study included 56 patients (28 in each group). Endoscopic DCR was done in one group with silicone stent intubation and other group without silicone intubation. Pre-operative and post-operative variables were evaluated for surgical outcomes using Munk scoring criteria. The absence of epiphora, a clear orifice, and the end of dacryocystitis episodes were considered signs of functional success. ANOVA tests were applied for comparisons.

Results: Among the total 56 patients, 25(44.6%) were females and 31(55.4%) were male patients with a mean age of 36.8±11.9 years. Success rate after 18 months (Munk 0) is 67.9% in the non-stent group and 57.1% in the stent group. The success rate of both groups is nearly the same, which shows that the silicon intubation is not associated with the success rate of EnDCR.

Conclusion: Given the comparable outcomes, non-intubated EnDCR should be considered the initial surgical option due to cost-effectiveness, reduced discomfort, and ease of postoperative care. However, this recommendation may not apply universally. Non-intubation is a reasonable first-line option but should be tailored to patient anatomy and risk factors. This study's small sample size is a limitation, and larger randomised trials are needed.

Keywords: Dacryocystorhinostomy, Epiphora, Endoscopy, Lacrimal Duct Obstruction.

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Introduction

A surgical procedure called endoscopic dacryocystorhinostomy (DCR) is performed to treat nasolacrimal duct obstruction, which results in excessive tearing because tear drainage is impeded.[1] During this procedure, the surgeon creates a new passageway between the lacrimal sac, duct and nose, enabling tears to pass through the clogged duct and enter the nose regularly. The techniques used for endoscopic DCR vary, especially when it comes to the use of silicone intubation.[2] The temporary implantation of a silicone tube or stent in the nasolacrimal system to preserve the patency of the recently created route and promote proper healing is known as silicone intubation.[3,4]

The first (En-DCR) was described in 1989 by McDonough and Meiring,[5] with minimal rates of problems. En-DCR has been demonstrated to produce results comparable to external DCR, with a success rate ranging from 83% to 94%.[6] Using an endoscope, the surgeon makes a new passageway. Silicone tubing is used to keep open the newly formed route throughout the early healing phase.[7] As a stent, the silicone tube keeps the opening from closing and makes sure tears are properly drained while promoting healing. The silicone tube is typically left in place for a few weeks to many months, based on the patient's condition and the surgeon's decision. By lowering the possibility of closure or scarring of the newly created passage, silicone intubation may increase the procedure's success rate. The other option is to do endoscopic DCR without Silicone Intubation, and make such a large opening in the nose that it is not blocked by fibrosis during healing.[7] The patency of the passage is dependent on natural healing and the formation of scar tissue in the absence of stent support. But there is a chance of the channel closing up or being scarred by healing tissue. Avoiding silicone intubation lessens the discomfort that comes with having a stent, yet in some circumstances, it may affect the success rate.[8] Both approaches have benefits and drawbacks, and the choice is often determined by the surgeon's preferences as well as the particular choice of the patient. The purpose of this study is to review our experience with EnDCR and to compare the success rate between the two procedures in terms of persistent epiphora.

Materials And Methods

This Comparative study design research study was conducted in the Combined Military Hospital, Abbottabad, from January 2022 to August 2023. The study was conducted according to ethical standards and principles. The study was approved by the hospital ethical committee (CMH Atd-ETH-116-ENT-23). A written informed

consent was taken from 56 patients. 56 operations were done during the time of study for chronic epiphora using En-DCR with and without silicone stents. The sample size was calculated by using of open EPI sample calculator, taking the stability of the anatomical pathway Mean of 8.5, 5% margin of error and 95%.

Patients could be of either gender, with chronic epiphora not relieved with adequate medical treatment, who gave their consent for surgery, are included. Patients with revision cases, post-traumatic stenosis, nasal polyposis, chronic sinusitis, and patients younger than 18 years who required additional endoscopic sinus surgeries are excluded from the research.

Each patient underwent clinical examinations in the otolaryngology and ophthalmology clinic. The Munk score was used for self-assessment of the symptom of chronic epiphora. The other signs and symptoms are listed like dacryocystitis, conjunctivitis, abscess, nasal stenosis and eyelid oedema. During operation, nasal decongestion is done by diluted adrenaline local packs. The thin lacrimal bone was illuminated. A high-definition camera and a 4.0 mm 0-degree Hopkins telescope were used for all procedures. Before approaching the lacrimal apparatus, patients with a deviated nasal septum underwent septoplasty. The lacrimal duct and sac were identified by removing the overlying bone. The lacrimal sac was opened, and irrigation of the lacrimal drainage system was done. In 28 patients, a bicanalicular silicone stent was inserted and tied together in the nose. Oral amoxicillin-clavulanic acid 625 mg thrice daily, nasal xylometazoline nasal drops thrice daily and steroid antibiotic eye drops four times daily were given to patients in both groups for five days. After surgery, postoperative evaluations were performed at one, two, three, six, twelve, and eighteen months. After surgery, two months later, the two-channel stent was removed through the nose. The success rate of the patient is dependent upon epiphora. For this purpose, the Munk score criteria have been used to assess epiphora in the patient. So, the surgery in which the patient had a 0 Munk score was considered successful. After this, the comparison between the stent group and the non-stent group has been made by applying ANOVA with a level of significance 95% based on the success rate.

Results

In this study, the mean age of the respondents was 36.8±11.9 years. Meanwhile, 25(44.6%) were female patients and 31(55.4%) male patients. All the parameters show significant results with a p-value less than 0.001. Concomitant intraoperative procedure in both shows significant results in both groups (Stent group and non-stent group). Concomitant intraoperative anatomical findings (e.g., septal deviation, mucosal adhesions) were observed in 5 patients (Figure I). These were addressed during surgery and did not significantly affect outcomes (P=0.12, chi-square test).

Success rate after 18 months (Munk 0) in the stent group was 16 (57.1%) and 19 (67.9%) in the non-stent group. (Table 1). Munk score values for each control during the postoperative follow-up period were 0, although there were no differences between any of the controls, the postoperative values were significant ($P < 0.001$; one-way ANOVA III. Meanwhile, several complications were found in both the stent and non-stent groups after surgery. (Table 2)

ANOVA was used for continuous variables (e.g., Munk scores), and chi-square/Fisher's exact tests for categorical outcomes (e.g., complication rates).

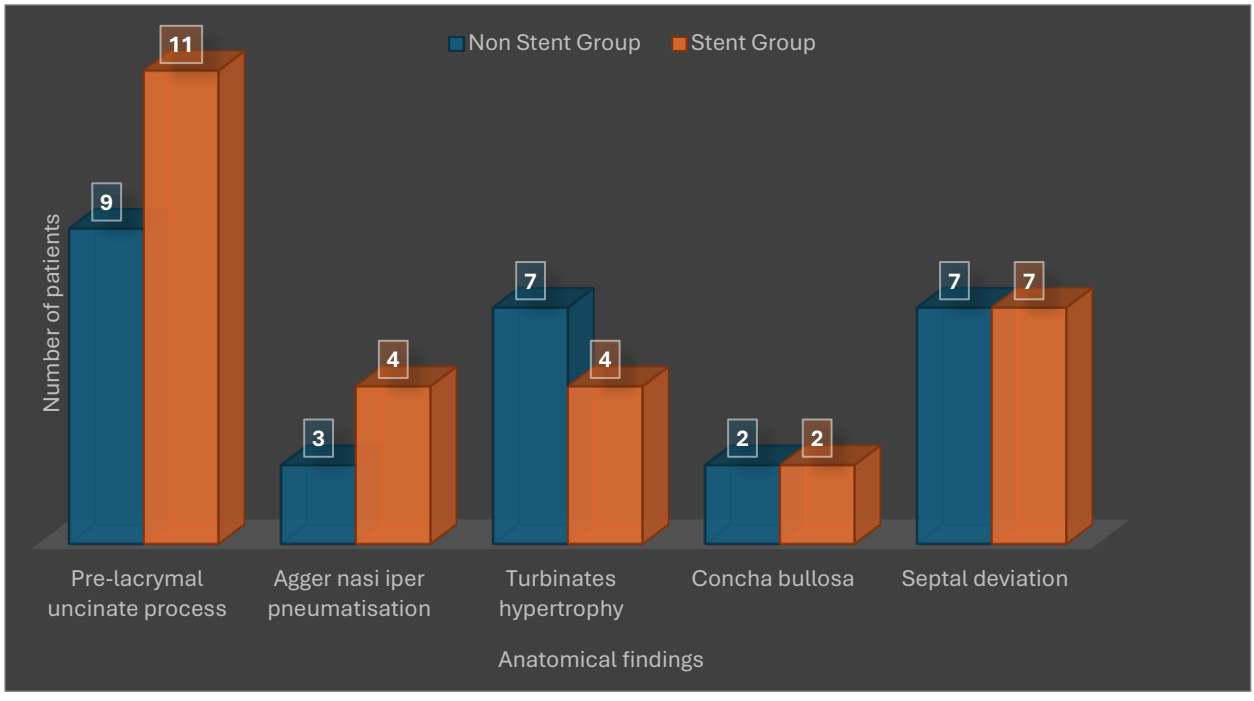

Figure 1: Concomitant Intraoperative Anatomical Findings (n=5)

Table 1: Success Rate after 18 Months in the Stent group and the Non-Stent group

Variables	Success rate(Mean ± SD)	95% Confidence Interval	P-value
Success Rate After 18 Months (Stent Group)	57.1% ± 8.9%	[48.2%, 66.0%]	<0.001 (ANOVA)
Success Rate After 18 Months (Non-Stent Group)	67.9% ± 7.5%	[60.4%, 75.4%]	<0.001 (ANOVA)

Table 2: Stent group and Non-stent group complications after surgery

Variable	Stent group	Non-stent group
Neo-ostium stenosis	2 (7.2%)	3 (10.7%)
Reduction in the diameter of the neo-ostium	4 (14.3%)	6 (21.4%)
Endonasal Scar and Obstruction	4 (14.3%)	2 (7.2%)
Turbinoseptal synaechia	3 (10.7%)	7 (25%)
Peristomal granuloma	8 (28.5%)	4 (14.3%)
Stent dislocation	4 (14.3%)	0 (0%)
Medial canthus disturbances	3 (10.7%)	0 (0%)
NA	0 (0%)	6 (21.4%)
Total	28 (100%)	28(100%)

Discussion

Silicone stents are placed to prevent or treat canal stenosis and provide support when mucosal flap formation is insufficient. On the other hand, the extended position may act as a trigger for the growth of inflammation and granulomas, which may ultimately lead to failure of the DCR procedure.[9] Some research has evaluated subjective improvement in epiphora, defined as Munk B1, positive endoscopic contrast test, and normal injection at 12-month follow-up, as a marker of appropriate surgery.[10] Three months after surgery, the absence of epiphora is a consistent indicator of the success of the procedure, according to the guidelines of the Royal College of Ophthalmologists.[11]

After eighteen months, we recorded the procedure as successful if the patient no longer had episodes of dacryocystitis and no epiphora. The absence of epiphora was 67.9% in those without stents and 57.1% with stents. We demonstrate that the overall slightly lower success rates in both groups compared to the literature can be attributed to our more strict evaluation criteria for surgical success. However, Munk's results for neither group showed any significant differences from those of the other control groups. A number of authors assert that silicone intubation can promote granulation tissue formation and lead to scarring, which may lead to the recurrence of symptoms,[12] although stent intubation may improve functional outcomes following En-DCR.[13] Bone volume decreases after En-DCR between 2 weeks and one year as a result of the formation of granulation tissue and scar tissue along with secondary induced healing.[14] An increased scar can lead to a stenosis above the middle opening of the common canal, which may cause failure of the DCR.

With a mean age of 36.8 ± 11.9 years (range: 20–60 years). Patient gender distribution was female 25(44.6%) and 31(55.4%) male patients. Presentation of symptoms requiring En-DCR in patients of the non-stent group include Epiphora 8, Saccal oedema 3, Dacryocystitis 9, Abscess 5 and Conjunctivitis 3, and in the stent group, the Epiphora was 11, Sacral oedema 4, Dacryocystitis 10, Abscess 1 Conjunctivitis 2. All the parameters show significant results p-value less than 0.00. Concomitant intraoperative anatomical findings in both groups show significant results in both groups (Stent group and non-stent group).

A study by Stajka et al found that there is no significant difference in the success rates of EN-DCR between stent and non-stent groups.[15] However, this study found that complications after the operation, including purulent secretions, infections, and granulomas, were more common in the group with silicone stents. When comparing the results of En-DCR with or without silicone intubation at 12-month follow-up, the analysis by Paul et al, randomised clinical trials reported no significant results.[16] Our results also match these studies. According to Orsilin MJ et al, endoscopic DCR is slightly more successful in patients who are used to it.[17] There are several limitations of previous studies, like small sample size,[18] Short follow-up durations,[19] non–random sampling and inconsistent definitions of success.[20]

Although the success rate between the stent and non-stent groups varies in different studies but overall, there is no significant difference between the two groups in most studies. Overall success rate in most international studies is more than 90%, but the success rate is lower in our study, which points to the fact that surgical expertise should be enhanced to improve the success rate. Small sample size is a limitation of this study.

Conclusions

Given the comparable outcomes, non-intubated EnDCR should be considered the initial surgical option due to cost-effectiveness, reduced discomfort, and ease of postoperative care. However, this recommendation may not apply universally. Non-intubation is a reasonable first-line option but should be tailored to patient anatomy and risk factors. This study's small sample size is a limitation, and larger randomised trials are needed.

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