Outcome of Endoscopic Endonasal Dacryocystorhinostomy With and Without Intubation

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ABSTRACT

Objective — *To assess and compare the functional and anatomical outcome of endoscopic endonasal dacryocystorhinostomy (EE-DCR) with and without silicone tube placement.*

Study design — *Retrospective cohort study.*

Place & Duration of study — *Department of Ophthalmology, Dr. Ziauddin Hospital Kemari Karachi, from January 2019 to December 2023.*

Methods — *This study included 204 patients between the ages 18-70 years. Patients with dacryocystitis were divided into two groups. Group A included those in whom EE-DCR was performed with the silicone tube placement and Group B patients who underwent the same procedure but without silicone tube. The outcome of surgery was assessed both objectively (anatomical) and subjectively (functional). The objective outcome was assessed by measuring the size of ostium and patency of nasolacrimal duct by performing probing and syringing on every follow-up visits. The subjective outcome was assessed on the basis of modified Likert score of epiphora.*

The data were entered into SPSS version 23 for analysis. Quantitative variables, such as age, were presented as mean ± standard deviation, while qualitative variables, like gender, were presented as frequency and percentages. Chi square test was used for comparison. A p-value < 0.05 was considered as significant.

Results — *This study included 204 patients diagnosed with dacryocystitis. They were divided into two groups of 102 each, based upon the surgical approach. In group A, 85 (83.3%) patients and in group B, 96 (94.1%) had a successful objective outcome at follow up which was significant (p=0.01). The subjective outcome assessment showed that in group A, 82 (80.4%) patients had a successful outcome while in group B, 96 (94.1%) had similar results. This was significant (p=0.003). In group A, the ostium size was adequate in 85 (83.3%) patients, while 9 (8.9%) had stenosed ostium. In group B, the ostium size was adequate in 96 (94.12%) patients, while 4 (3.92%) were stenosed.*

Conclusion — *The comparative analysis showed that EE-DCR without silicone tube placement resulted in less complication rate with quicker recovery time.*

Key words — *Endonasal endoscopic DCR, Chronic dacryocystitis, Nasolacrimal duct obstruction, Chronic epiphora.*

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INTRODUCTION:

Dacryocystorhinostomy (DCR) is a surgical procedure that is performed on patients experiencing chronic epiphora due to nasolacrimal duct obstruction.[1] In DCR procedure an alternative pathway is established by creating an ostium between the lacrimal drainage pathway and the nose. DCR can be performed by external or internal approach.[2] The external DCR is

considered as a gold standard procedure due to its high success rate.[3] However, this surgical approach involves a curvilinear incision through the skin 3-4 mm from the medial canthus and 10-12 mm in length, potentially leading to scar formation.[4] Patients usually express cosmetic concern about the resulting surgical scar.

The internal approach, endonasal endoscopic DCR, involves the use of video-assisted endoscope to visualize the nasal mucosa, allowing the creation of a nasal flap.[5] Subsequently, an ostium is formed into the lacrimal bone to expose the lacrimal sac. The lacrimal sac is then opened with a relaxing incision. Additionally, a silicone tube may be inserted through the upper and lower puncta, passing through the ostium and then tied into the nose.[6]

The choice between EE-DCR with or without silicone tube depends upon the patient's condition and surgeon assessment as both approaches have their advantages and disadvantages. The silicone tube helps to maintain the newly created drainage pathway between the lacrimal sac and nasal cavity, facilitates the tear drainage, reduces the risk of closure and promotes tissue healing.[7] The main disadvantage of tube insertion is the need for removal after three months. Its presence may cause foreign body sensation and nasal mucosal irritation. Additionally, during insertion, iatrogenic trauma may occur, potentially leading to granuloma formation and ostium stenosis.[8]

EE- DCR without silicone tube is an alternative procedure which has several advantages like quick recovery, no foreign body sensation, less postoperative care and minimal chance of infection.[9] Beside these some disadvantages are also observed like ostium stenosis and less mechanical support for the nasolacrimal duct which impact the tear drainage.[10] The aim of this study was to assess and compare the functional and anatomical outcome of EE-DCR with and without silicone tube placement.

METHODS:

Study design, place & duration: A retrospective cohort study was conducted at the Department of Ophthalmology, Dr. Ziauddin Hospital Kemari, Karachi. The data were collected from the hospital record covering the previous five years period, from January 2019 to December 2023.

Ethical considerations: Ethical wavier was obtained from the institutional ethics committee before initiating the collection of data from hospital record (8091123AKOPH / December 2023).

Inclusion and exculsion criteria : Patients between 18-70 years of age who underwent EE-DCR with or without silicone tube with complete record including preoperative, operative and postoperative follow up data were included. Patients in whom external DCR was performed were excluded. Patients who had any previous failed external DCR, the history of lacrimal tumors or trauma were also excluded.

Sample size estimation and sampling technique: For sample size estimation in a retrospective comparative study a sample of 102 was required for each group. Purposive sampling technique was used.

Study protocol: The study included 204 patients whose data were analyzed. Patients were divided into two groups. In Group A, EE-DCR was done with placement of silicone tube and in Group B without silicone tube. Postoperative follow ups were done regularly in the clinics. Data regarding the removal of silicone tube was also noted. The DCR silicone tube was removed after three months postoperatively in all the patients of group A.

During each follow-up appointment, patients underwent examination by both an ophthalmologist and an ENT surgeon to assess the anatomical (objective) and functional (subjective) outcomes of the surgery. Objective outcomes were assessed by performing probing and syringing to evaluate the patency of the nasolacrimal duct and to conduct an endoscopic assessment of the ostium size. Subjective outcomes were assessed on the basis of modified Likert score of epiphora. A score of 1 was indicative of no symptoms, 2 indicated significant improvement, 3 was slight improvement, 4 was no improvement while 5 showed a worsening of the symptoms. Likert scores of 2, 3 and 4 were considered a failed DCR.[11]

Statistical analysis: The data were entered into SPSS version 23 for analysis. Quantitative variables, such as age, were presented as mean ± standard deviation, while qualitative variables, like gender, were presented as frequency and percentage. Comparative data were analyzed using a Chi square test, with significance indicated by a p-value < 0.05.

RESULTS:

The mean age of the patients in both the groups was 46.7±2.3 year. In Group A, there were 27 males (26.4%) and 75 (73.5%) females, while in Group B, there were 32 males (31.3%) and 70 (68.7%)

Table I: Objective Outcome of the Endoscopic Endonasal DCR

	Group A				Group B			
	With Stent				Without Stent			
Score	1st month	3rd month	6th month	1 year	1st month	3rd month	6th month	1 year
Ostium patent	102 (100%)	93 (91.18%)	88 (86.27%)	85 (83.33%)	100 (100%)	99 (97.0%)	96 (94.12%)	96 (94.12%)
Ostium close	0 (8.82%)	9 (8.82%)	14 (13.73%)	17 (16.67%)	0 (12.75%)	3 (3.0%)	6 (5.88%)	6 (5.88%)

Chi-square: 5.9294, p=0.01* significant

Table II: Subjective Outcome of the Endoscopic Endonasal DCR

	Group A				Group B			
Modified Likert Score	With Stent				Without Stent			
	1st month	3rd month	6th month	1 year	1st month	3rd month	6th month	1 year
1 (No symptom)	74 (72.54%)	76 (74.51%)	70 (68.62%)	69 (67.65%)	79 (77.45%)	81 (79.41%)	82 (80.39%)	82 (80.39%)
2 (Significant improvement)	9 (8.82%)	11 (10.78%)	14 (13.73%)	13 (12.75%)	13 (12.75%)	14 (13.73%)	14 (11.76%)	14 (11.76%)
3 (Slight improvement)	12 (11.76%)	10 (9.80%)	12 (11.76%)	15 (14.71%)	6 (5.88%)	4 (3.92%)	4 (3.92%)	4 (3.92%)
4 (No improvement)	7 (6.86%)	5 (4.90%)	6 (5.88%)	5 (4.90%)	4 (3.92%)	3 (2.94%)	2 (1.96%)	2 (1.96%)
5 (Worsening of symptoms)	0	0	0	0	0	0	0	0
Result	83 (81.37%)	87 (85.29%)	84 (82.35%)	82 (80.39%)	92 (90.20%)	95 (93.14%)	96 (94.12%)	96 (94.12%)

Chi-square: 8.6396, p=0.003* significant

females. Collectively in both the groups, 98 (48.1%) patients presented with dacryocystitis in right eye, 80 (39.2%) in left eye and in 26 (12.7%) patients both eyes were affected. The mean duration of surgery for both the groups was 26±2.5 minutes.

A comparison of the outcomes of the procedures performed is given in table I and II. In group A, 85 (83.3%) patients and in group B, 96 (94.1%) had a successful objective outcome at follow up with a p-value of 0.01. The subjective outcome assessment showed that in group A, 82 (80.4%) patients had a successful outcome while in group B, 96 (94.1%) had similar results. This was significant with the p-value of 0.003.

In Group A, 85 (83.3%) patients had an open nasolacrimal duct while 96 (94.12%) patients of group B had similar findings. In group A, the ostium size was adequate in 85 (83.3%) patients, while 9 (8.9%) had stenosed ostium, 5 (4.9%) had granulomas and 3 (2.9%) had synechiae with nasal septum. In group B, the ostium size was adequate in 96 (94.12%) patients, while 4 (3.92%) were stenosed, 1 (0.98%) each had granuloma and synechiae with nasal septum.

DISCUSSION:

This study has shown better outcome with the endoscopic approach for DCR without using silicone tube. Endoscopic DCR is reported as advantageous in comparison with external approach with a high success rate, better cosmetic appearance and short hospital stay. However, use of silicone stent is debatable.[12] Studies have shown no significant difference in success rates between the two endoscopic approaches though increased complication rates are reported with the placement

of silicon stent. This includes granuloma formation and ostium stenosis after removal of the tube.[13] In this study better results are found in Group B, where stent was not used.

In a comparative study by Aga et al on 111 patients with acute dacryocystitis, 54.05% had surgery silicone stents in place. They found a significant difference in the complication rates in patients with silicone stent. This included purulent secretions, epiphora and infections.[14] A similar study on 60 patients suffering from chronic epiphora who were randomized into silicone stent tube and non stent groups a high success rate was found in patients without the stent that was statistically significant. They reported an increased risk of re-stenosis by 14-1 months with the stent.[15] The risk of re stenosis in our study was only 5.88% without stent. This was significantly less than the other approach.

Maldhure et al reported the endoscopy findings at 12 month post-surgery with patent opening in 93.3% of stent patients and in 90% of non-stented patients. However, this was not statistically significant. They did not recommend use of the stent. However, in patients with lacrimal gland cysts and sinonasal pathologies it may considerd.[16] In our study patency of the ostium was higher in non stent group which is a different finding in comparison with the above data.

Limitations of the study: This was a retrospective study from a single center. A multi-center randomized controlled trial can provide a more convincing data on the subject.

CONCLUSION:

EE-DCR without the placement of silicone tube reduces the complication rate. There was a short recovery time and better outcome in a long-term follow up as well.

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