

Surgical Outcome of Endoscopic Dacryocystorhinostomy with Nasal Flap Preservation Versus Flap Removal Technique, A Comparative Study

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Abstract

Objective: To assess the efficacy of endonasal endoscopic dacryocystorhinostomy with nasal flap preservation and flap removal technique, in patients with chronic dacryocystitis secondary to the nasolacrimal duct obstruction.

Methodology: This prospective study is including 60 patients who underwent endoscopic DCR complaining from continuous epiphora due to acquired nasolacrimal duct obstruction attending OPD in the department of Otorhinolaryngology, GMERS medical college, Himmatnagar, Gujarat. Patients included in the study had been subjected to our standard pre operative evaluation included a complete history and physical examination, lacrimal sac syringing, probing of the canaliculi and nasal endoscopy. All route in and specific investigations required for GA is done. The subjects assigned to either group A or group B depending on intra-operative nasal mucosal flap position. Group A patients were treated with repositioning of nasal mucosal flap on bare bone and group B patients were treated with the removal of nasal mucosal flap and the bare bone was covered with abgel.

Result: All 60 patients were reviewed for 1week, 4week 3months and 6 months. Among 60 patients 44 (73.3%) patients were female and 16(26.6%) patients were male. The youngest patient found in the study was 14 years old boy, and eldest was 72 years old female. Epiphora (100%) was most common presenting symptom. In 34 eyes (group A), flap preservation was done and in 34 eyes (Group B) flap removal DCR was performed. In 3 month postoperative visit, the results are showing that there is no statistical significant difference between the two groups Overall, the success rate of the procedure in group A is 100% when compared to group B (97.05%), Whereas 1 eye (2.9%) in group B were in failure in terms of epiphora. Comparison of surgical outcome between two groups was statistical insignificant (P=0.93).

Conclusion: There is not much difference in the success rate of surgery if mucosal flap is sacrificed. So it is of no matter whether to preserve or to remove the mucosal flap.

Keywords: Dacryocystorhinostomy, DCR, epiphora, mucosal flap.

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Introduction

Constant epiphora is the commonest symptom of chronic dacryocystitis, secondary to nasolacrimal duct obstruction (NLD). The condition is mostly unilateral but bilateral eyes can be involved. Prolong tears stasis in lacrimal sac invites secondary bacterial infection which can lead to acute on chronic dacryocystitis [1].

Dacryocystorhinostomy (DCR) is a surgical procedure that performs in epiphora due to nasolacrimal duct obstruction. With the event of nasal endoscope, endoscopic DCR has come in existence and now a day it is preferable over external DCR due to cosmetic reasons. There also preservation of lacrimal pump, direct visualization of rhinostomy site, improve haemostasis from mucosal surface also having short duration of surgical procedure, short recovery time and less morbidity. Endoscopic DCR was first described by Caldwell. DCR creates the low resistant newly formed anastomosis between lacrimal sac and lateral nasal mucosa. Several modalities and adjunct such as Kerrison punch, power drill, and laser has been described in endoscopic DCR with the aim of improving operating technique, success and reducing complications. The purpose of this study is to access the efficacy of Dacryocystorhinostomy with versus without nasal mucosal flap preservation in patients with chronic dacryocystitis, secondary to the NLD obstruction.

Material and Methods

A prospective longitudinal cohort study is conducted from April 2022 to March 2023 in the department of Otorhinolaryngology, GMERS medical college and research institute Himatnagar, Gujarat, Data is collected from 60 patients who underwent endoscopic DCR complaining from continuous epiphora due to acquired nasolacrimal duct obstruction. We excluded congenital cases, canalicular obstruction, revision surgery, traumatic obstruction and

connective tissue diseases. Patients requiring concurrent septoplasty were included in the study. Our standard pre operative evaluation included a complete history and physical examination, lacrimal sac syringing, probing of the canaliculi and nasal endoscopy. Jones test, Dacryocystography and lacrimal scintigraphy were not used. CECT PNS were performed in few cases to detect associated anatomical or pathological conditions. All route in and specific investigations required for GA is done. The subjects assigned to either group A or group B depending on intra-operative nasal mucosal flap position. Group A patients were treated with repositioning of nasal mucosal flap on bare bone and group B patients were treated with the removal of nasal mucosal flap and the bare bone was covered with abgel.

Surgical Technique

All cases were operated under general anaesthesia. To provide sufficient decongestion and vasoconstriction, the nose was packed with cotton pledgets soaked in 4% xylocaine with 1:100,000 adrenaline. An incision was made in lateral wall of nose with the help of sickle knife. Posteriorly based mucosal flap was created, with incision beginning approximately 8mm above the axilla of middle turbinate and was extended horizontally 8mm anterior to the middle turbinate. It is taken vertically down to just above the upper border of inferior turbinate extending posteriorly up to the insertion of the uncinat process. A Freer's periosteal elevator was used to elevate the mucosoperiosteal flap from the underlying bone. The frontonasal process of maxilla, lacrimal crest and lacrimal bone were exposed. Bone covering lacrimal sac was punched out using Kerrison punch to expose the lacrimal sac. After full exposure of lacrimal sac, lacrimal punctal dilator is used followed by Bowman's lacrimal probe to ensure patency of the punctum and canaliculi. The lacrimal sac then confirmed

by fullness noted in lacrimal sac after syringing and its medial wall was incised by sickle knife or blade, a large anterior and smaller posterior flap created, small horizontal cuts are made in these flaps superior and inferior so they can reflected on to the lacrimal nasal wall without any tension. Once the lacrimal sac flaps have been positioned, in the Group A the flap is divided to upper and lower part, upper part of flap is resected and lower is preserved, where in Group B patients nasal mucoperiosteal flap completely removed. Rest of the operative procedure was the same for both the groups. Syringing was done through lower punctum and free flow of saline was established, no stent or mitomycin C used in our surgery. Haemostasis achieved, no nasal pack is needed and bare bone covered with abgel.

Post-operative Care

1. Nasal decongestant drops used for 3 successive days.
2. Antibiotic with steroid eye drops was used three times in a day for 2 weeks.
3. Massage with fingers over the sac area every 3 hourly from the second post operative day.
4. Oral broad spectrum antibiotics for 7 days.
5. Analgesics were given when required.
6. Patients are generally to be reviewed in the out patients department at 1st week, 4th week and 3rd month after surgery.

Nasal endoscopy is performed in these visits to remove any crusts in nasal cavity and to confirm the patency of the nasolacrimal stoma by direct visualizing the flow of saline during lacrimal syringing. Success rate of surgery was assessed at follow up visits by subjective method (reduction or absence of symptoms of epiphora) as well as objective method (patent stoma on syringing of lacrimal drainage system).

Observation and Result

All 60 patients who underwent endoscopic Dacryocystorhinostomy were reviewed. 8

patients had procedures in both eyes so a total of 68 surgeries were performed, including 32 right eyes and 36 left eyes (TABLE III). In the series of 60 patients 44 (73.3%) patients were female and 16(26.6%) patients were male (TABLE I). In 34 eyes (group A), flap preservation was done and in 34 eyes (Group B) flap removal DCR was performed (TABLE IV). The youngest patient found in the study was 14 years old boy, and eldest was 72 years old female. Concurrent septoplasty was done in 21 patients, 15 of group A and 6 of group B patients. Epiphora (100%) was most common presenting symptom followed by punctual discharge (46.6%), lacrimal swelling (31.6%) and lacrimal fistula (18.3%) (TABLE V). TABLE VI shows the rhinostomy site after 1week, 4week and 3 month of surgery. In group A, after 3 months of the surgery rhinostomy site well mucosalized in 32 cases. Crustation found in 2 cases, Granulation, Synechia and Epiphora found in 0 cases, the patency after 3 months by syringing, patent 34 cases, no any blocked stoma found at the end of 3 months. In group B after 3 months of surgery rhinostomy site well mucosalized in 29 cases. Crustation, granulations, synechia and epiphora found in 1,3,1,1 cases, respectively. In 33 cases stoma was patent and partially blocked in 1 case. In 3 month postoperative visit, the results are shown in table VI where there was no statistical significant difference between the two groups regarding mucosalization, crustation, granulation, synechia, epiphora and ostial patency. Overall, the success rate of the procedure in group A is 100% and success rate of procedures in group B is 97.05%, on the basis of absence of epiphora and patent lacrimal passage on syringing. Whereas 1 eye (2.9%) in group B was in failure in terms of epiphora. Comparison of surgical outcome between two groups was statistical insignificant (P=0.93).

Table 1: Gender Wise Distribution of Patients

Gender	Number of Patients	% of Patients
Male	16	26.6%
Female	44	73.3%
Total	60	100%

Table 2: Site Wise Distribution of Patients

Site	Number Of Patients	% Of Patients
Right	24	40%
Left	28	46.6%
Bilateral	8	13.3%
Total	60	100%

Table 3: Site Wise Distribution of Procedure

Site	Number Of Procedure	(%) percentage
Right	32	47%
Left	36	52.9%
Total	68	100%

Table 4: Technique Wise Distribution of Procedure

Technique	Number Of Procedure	% Of Procedure
Falp Preservation	34	50%
Flap Removal	34	50%
Total Number Of Procedure	68	100%

Table 5: Presenting Symptoms of Patients

Presenting Symptom	Number Of Patients	%Of Patients
Epiphora	60	100%
Puntal Discharge	28	46.6%
Lacrimal Swelling	19	31.6%
Lacrimal Fistula	11	18.3%

Table 6: Postoperative Comparisons between Groups in Follow Up

Rhinostomy Site	Group A			Group B		
	1 Week	4week	3 Month	1week	4week	3month
Well Mucosalized	15/34 (79.4%)	28/34 (82.3%)	32/34 (94.1%)	10/34 (29.4%)	19/34 (55.8%)	29/34 (85.2%)
Crustation	10/34 (29.4%)	6/34 (17.6%)	2/34 (5.8%)	22/34 (64.7%)	15/34 (44.1%)	1/34 (2.9%)
Granulations	2/34 (5.8%)	0/34 (0%)	0/34 (0%)	8/34 (23.5%)	6/34 (17.6%)	3/34 (8.8%)
Synechiae	2/34 (5.8%)	1/34 (2.9%)	0/34 (0%)	5/34 (14.7%)	1/34 (2.9%)	1/34 (2.9%)
Epiphora	0/34 (0%)	0/34 (0%)	0/34 (0%)	0/34 (0%)	0/34 (0%)	1/34 (2.9%)
Patent Stoma	31/34 (91.1%)	33/34 (97%)	34/34 (100%)	30/34 (88.2%)	33/34 (97%)	33/34 (97%)
Partially Blocked	3/34 (8.8%)	1/34 (2.9%)	0/34 (0%)	4/34 (11.7)	1/34 (2.9%)	1/34 (2.9%)
Blocked Stoma	0/34 (0%)	0/34 (0%)	0/34 (0%)	0/34 (0%)	0/34 (0%)	0/34 (0%)

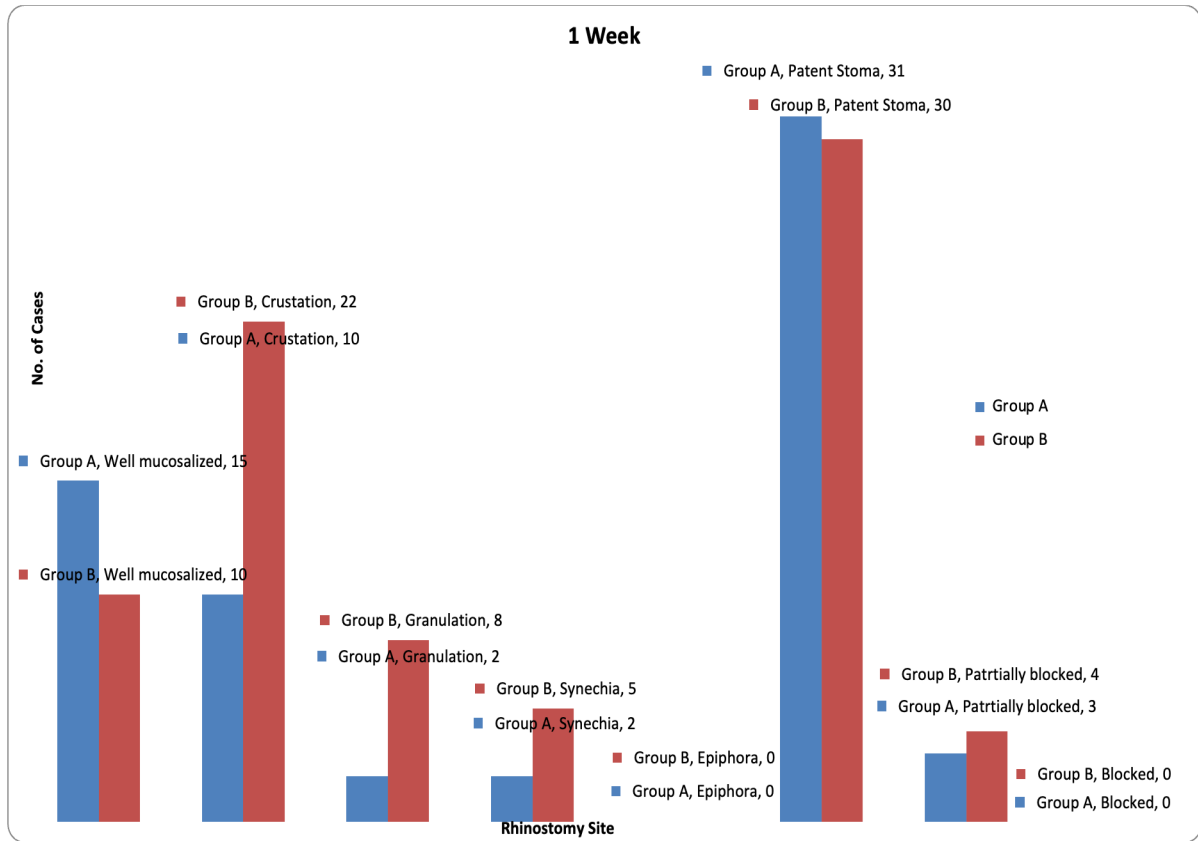


Figure 1: Showing comparison between groups at 1 week follow-up.

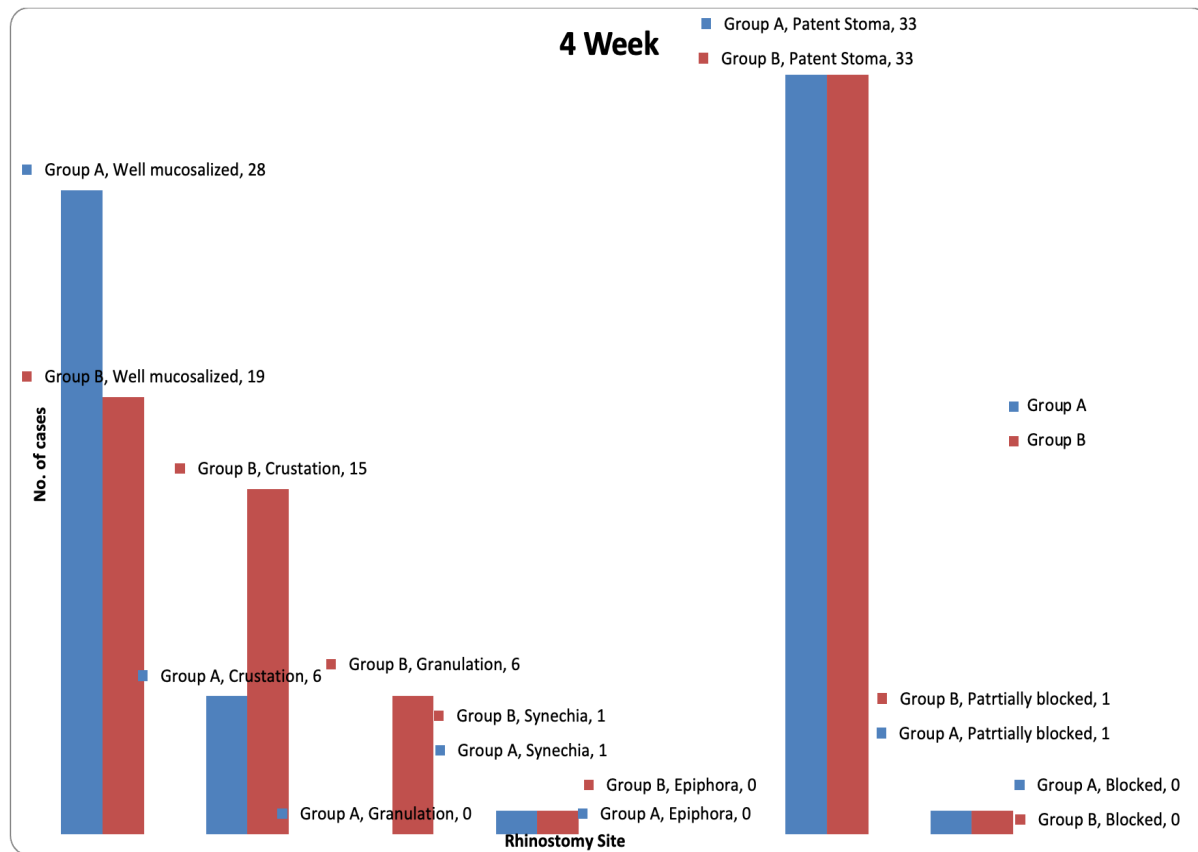


Figure 2: Showing comparison between groups at 4week follow up.

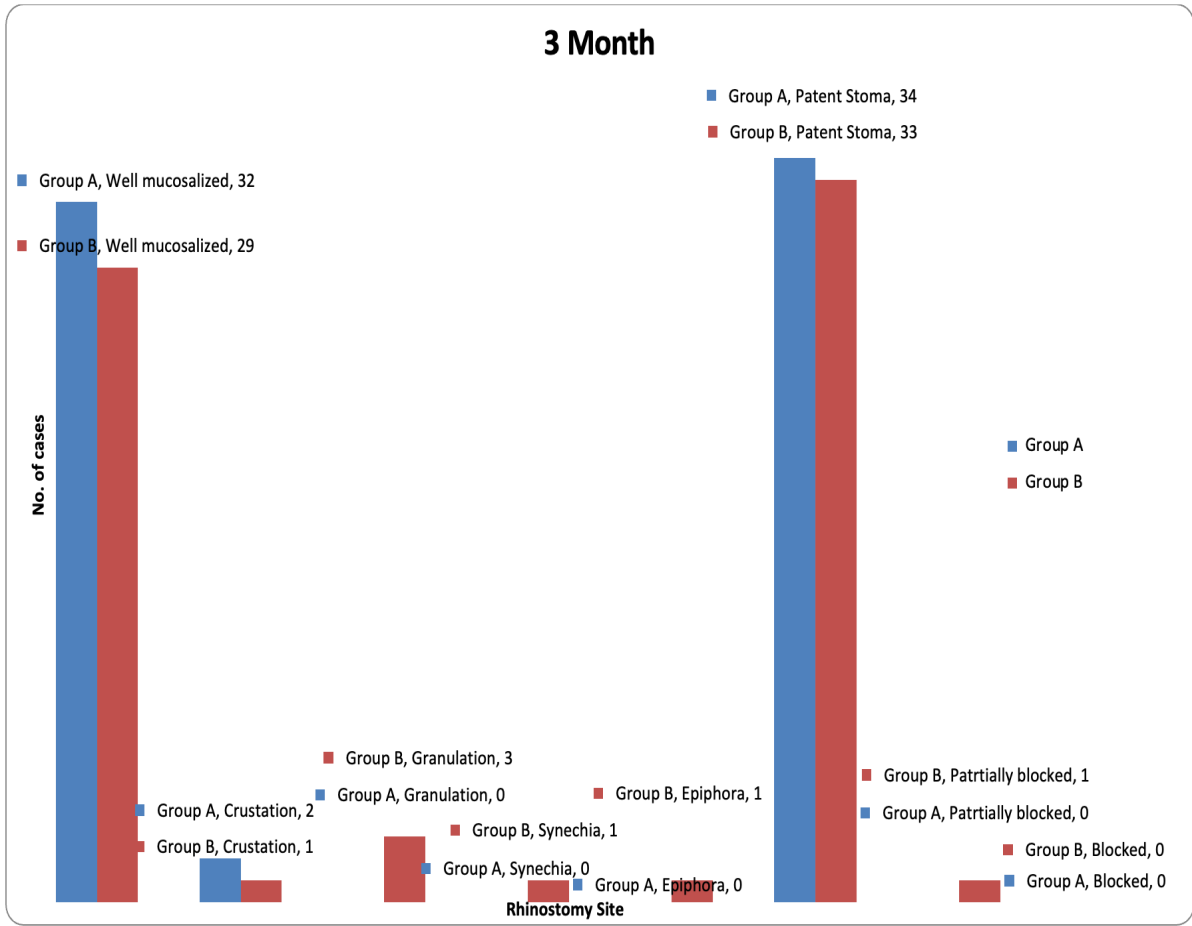


Figure 3: Showing comparison between groups at 3 month follow-up.

Table 7: Surgical Outcome after 3 Post-Operative Months

Group	Total No. Of Procedure	Successful Cases	Percentage
A	34	34	100%
B	34	33	97.05%

Discussion

A growing clinical experience has confirmed the value of the endoscopic DCR technique in the management of canalicular and post canalicular obstruction, Refinements in technique and instrumentation coupled with the knowledge of detailed endoscopic anatomy are largely responsible for the excellent success rates. It was noted that failure of the endoscopic technique seemed in large part due to poor understanding of the endoscopic anatomy, which lead to poorly placed rhinostomies and inadequate bone removal, which lead to fibrosis and scarring of the intranasal stoma, unexposed common

canaliculi or subsequent sump syndrome (2).

In our study total numbers of 68 eyes of 60 patients were included. Majority of patient were in age range of between 14 to 72 years. The mean age of patient is 45 years, and most affected age group was 41-50 years, which goes with a study done by Linberg et al (3) that showed the age of patients ranged from 14-74 years. However it is incomparable to Kamal et al (4) that showed the mean age at presentation was 34 ranging from 4-75 years.

In present study females was predominantly affected then the males such as 44(73.3%) patients were female and 16(26.6%) with

female to male ratio of 11:4, which agree with study done by Ambani et al(5), Kamal et al(4) and Ji et al(6). Woog et al (7) demonstrated that narrow lacrimal canal, in women may contribute to the prevalence of nasolacrimal duct obstruction in female patients. In addition chronic dacryocystitis had been observed in low socio economic group due to their bad personal habits, Long duration of exposure to smoke in kitchen and dust in external environment. In addition to that use of kajal and other cosmetics increase chance of transmission of infection (8).

In the present study we assess the success outcome of DCR with mucoperiosteal flap preservation (Group A) and compare with DCR with flap excision (group B).The success outcome in Group A was 100% and in Group B was 97.05%. The result was statically insignificant ($P=0.93$) and indicates that both the techniques are equally effective and successful. This result is comparable to Kansu et al(9) who conducted a comparative study of surgical outcome of endoscopic DCR with and without mucosal flap and the results show that the surgical success rate was 100% and 88.3%, respectively. The result indicated that the closure off bare bone with nasal mucosal flap and an anastomosis between the lacrimal sac mucosa and the nasal mucosa decreases the formation of granulation tissue. But there was no significant difference of success rate. Khilifa et al (10) also conducted a prospective study of 80 procedures where an endoscopic DCR with mucosal flap had a higher but no significant difference in success rate when compared with endoscopic DCR without mucosal flap, and this also in accordance with our results. Durvasula and Gatland reported that the formation of granulation tissue may be caused by bare bone (11).Parmar et al (12), found that preserving the lacrimal and nasal mucosa through endoscopic approach to treat nasolacrimal duct obstruction leads to high success rate by controlled lining of the

fistula with mucosal flaps which appears to prevent closure of the ostium. The success rate after one year follow up was 83.33%and 81.81% for with and without mucosal flap preservation respectively, he also did not point out the significant difference between two groups. However Ji et al (6) reported that preservation of mucosal flap associated with improved success rates with statistically significant improvement when compared with mucosal flap removal 98% vs. 84% respectively. Mahendran et al (13) introduced another option, like using a free mucosal flap to cover the bare bone in patients undergoing endoscopic DCR. However, it also had limitations and/or disadvantages, such as being time-consuming, flap mobility and difficulty with survival of the free flap on the bare bone, especially when the created flaps cannot reach a full coverage of the bare bone in the ostium. We believe that excision of flap is easier, simple procedure and shortens the surgery time rather than poorly created mucosal flap which may block the bony ostium due to fibrosis and granulation tissue. It is also beneficial in those circumstances where patient bleed heavily during surgery and visibility of nasal mucosa is compromised.

Conclusion

The closer of bare bone with nasal mucosa improve the outcome of endoscopic DCR as well as reduce the chances of the synechiae formation and granulation tissue however there is not much difference in the success rate of surgery if mucosal flap is sacrificed. So it is of no matter whether to preserve or to remove the mucosal flap.

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