

## Endoscopic dacryocystorhinostomy with and without silicone stenting: A comparative study

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**Abstract:** *Background and objectives:* The objective of the present study is to compare the results of performing endonasal dacryocystorhinostomy for primary nasolacrimal duct obstruction with and without silicone stenting. *Methods:* This is a prospective randomized study including 57 patients who underwent 62 endonasal DCR procedures. 32 eyes underwent DCR with bicanalicular silicone stenting which was kept for 6 weeks. 30 eyes underwent DCR without stenting. Follow up was done for 6 months. Outcome of the surgery was noted as success in terms of complete relief from epiphora, patency of the ostium assessed by nasal endoscopy and lacrimal sac syringing. *Results:* The overall success rate for endoscopic endonasal DCR was 90.3%. Success rates were 93.7% with stenting and 86.7% without stenting. There was no statistical difference in the outcome of the two groups ( $p=0.4180$ ). Complications noted were granulations, synechiae, periorbital edema and punctal trauma, with no difference in the frequency of occurrence in the two groups. *Conclusion:* There is no significant increase in the success rates of DCR on using silicone stenting. A selective stenting approach may be advocated, using stenting for specific indications. With proper technique and good follow up, stenting is not associated with any significant complications.

**Keywords:** Nasolacrimal duct obstruction; Endoscopic DCR; Bicanalicular silicone stent.

### Introduction

Dacryocystorhinostomy (DCR), a surgical procedure by which lacrimal flow is diverted into the nasal cavity through an artificial opening made at the level of the lacrimal sac, is indicated when there is symptomatic obstruction of nasolacrimal duct that is not relieved by simple probing and syringing.

Endonasal endoscopic DCR has gained popularity over the years because it is an effective, easy, well tolerated procedure with the advantages of avoidance of an external scar, preservation of the lacrimal pump mechanism, and being relatively easy to perform. Its efficacy ranges from 80 to 90% as concluded by various studies. Caldwell first described the intranasal approach in 1893. Since then, the surgical technique has been evolving to improve the long term success rates.

Though the cause for postoperative stomal closure is postulated to be inadequate bone removal commonly, it remains difficult to predict which cases can fail. Several methods like intubation, mitomycin C application to the

rhinostomy opening, suturing of the mucosal flaps, merogel covering on the wound etc have been suggested to maintain a permanent opening.

Bicanalicular silicone stenting has been a tried and tested method used by many surgeons to prevent rhinostomy closure. While earlier studies have advocated use of stents, recent studies mention that complications of stent overweigh the benefits. The aim of this study is to compare the outcome of primary DCR for acquired nasolacrimal duct obstruction with and without stenting in our setup.

### Material and Methods

This is a comparative study including 57 patients conducted at the Karnataka institute of medical sciences, Hubli. The subjects were adult patients with acquired nasolacrimal duct obstruction treated surgically by endonasal endoscopic dacryocystorhinostomy. Follow up of the patients was for 6 months. Patients were selected for the study based on the following criteria:

**Inclusion criteria:** Patients above the age of 15 years presenting with chronic dacryocystitis and diagnosed as primary acquired nasolacrimal duct obstruction.

**Exclusion criteria:**

- Cases of congenital dacryocystitis
- Patients with suspected presacal obstruction including canalicular obstruction and punctal stenosis.
- Coexisting nasal pathologies which could influence the outcome of the surgery like atrophic rhinitis, chronic granulomatous diseases of the nose, any nasal tumours, etc.
- History of previous lacrimal surgery; failed cases.
- Post traumatic and post radiation epiphora.
- Immunocompromised patients, uncontrolled systemic diseases.

After detailed local and systemic examination was undertaken, lacrimal syringing was done to confirm nasolacrimal duct obstruction and rule out punctal and canalicular stenosis. A total of 62 surgeries were performed. The patients were divided into two groups randomly. In 29 patients (Group A) endonasal dacryocystorhinostomy was done with bicanalicular silicone stenting, including bilateral procedures in 3 cases. The silicone stent was introduced through both the puncta and the ends of the stent secured with multiple knots in the nasal cavity with caution to prevent tension at the canthal region. Stents were placed for 6 weeks, removed under endoscopic vision. In 28 patients (Group B) only endonasal dacryocystorhinostomy was done, with 2 bilateral procedures.

Patients were followed up for 6 months. Outcome was evaluated in terms of:

- ✓ Complete resolution of all symptoms
- ✓ Free flow of saline on lacrimal syringing
- ✓ Presence of a patent stoma as confirmed by nasal endoscopy

**Results**

In our study, majority of the patients were in the age group 31 to 40 years. The youngest patient was a 17 year old and the oldest, 75 year old. 42 were females and 15 cases were males. There was no statistical difference in the gender distribution between the two groups.

The main presenting complaint was epiphora which was present in all cases. Other complaints were intermittent purulent discharge from the eye which was present in 28% of the patients, and swelling in the lacrimal region in 17.5%. Concurrent septoplasty was done in 12 patients. There was no statistically significant effect of performing septoplasty on the outcome of the surgery in both the groups.

Result	Group A		Group B	
	Number	%	Number	%
Success	30	93.75	26	86.7
Failure	2	6.25	4	13.3

The overall success rate for endonasal DCR was 90.3%. In group A, the success rate was 93.75% and in group B, 86.7%. The above results were subjected to statistical analysis using Fisher’s exact test. A p value of 0.4180 was obtained which is statistically insignificant (p>0.05). In group A, of the 2 failures, one patient had granulations at the stomal site. The other patient had synechia between the stomal site and the middle turbinate leading to stomal closure. In group B, of the 4 patients who came with recurrence, three patients had stomal closure at 6 months with no apparent complication of the surgery. One patient who had undergone DCR with septoplasty had extensive synechiae between the septum and the lateral nasal wall resulting in a blocked stoma.

There were no major intraoperative complications in any of the 62 procedures. Post operatively, the following complications were observed and there was no statistical difference in the frequency of complications between the two groups.

Complication	Group A	Group B	Total
Synechiae	3	2	5
Granulation	3	1	4
Punctual trauma	3	0	3
Lid edema	5	2	7

## Discussion

Surgery for chronic dacryocystitis has undergone major changes from the original description of DCR by Toti. With the advent of modern endoscopic instruments, DCR is being increasingly performed by the otorhinolaryngologist. False localization of the sac, granulation tissue formation, retained bony spicules, synechiae, inadequate removal of medial wall of the sac are most common causes for failure. Silicon stenting is one of the methods proposed for achieving long term patency, due to maintainance of the ostium and also correction of any associated pre saccal stenosis.

In our study, the anatomical and functional success rate in the group with stenting was 93.75% and in the group without stenting, 86.7%. This result was found to be statistically insignificant ( $p = 0.4180$ ), implying that stenting in DCR had no significant effect on the outcome of the procedure. There have been quite a few studies comparing the efficacy of routine silicone intubation in DCR.

In one such study on 30 cases of postsaccal stenosis, they inferred that DCR without intubation should be the treatment of choice considering the similar success rates, granulation formation and patient discomfort [1]. A study published in 2006 had bicanalicular silicone stents inserted in 18 cases and in 24 cases stenting was avoided. Overall success rate was 89% with silicone tubing and 75% without silicone tubing, not statistically significant. However, they mention that prospective, randomized studies are clearly needed to answer the question of whether the use of stents is advisable [2].

The same author in 2008 published a small randomized controlled trial of intubation versus non-intubation with only 46 patients undergoing primary endonasal DCR (without canalicular pathology). Success rates – by relief of symptoms and patency to syringing – were 100% for the non-intubated group versus 78% for the intubated group ( $p < 0.049$ ) after 6 months. They conclude that use of silicone tubes in primary DCR is not necessary [3]. Gu Z and Cao Z, in their publication where a meta analysis of studies on silicone intubation in endoscopic DCR between 1990 and 2009 was done, also conclude that use

of silicone tubes after primary endonasal DCR is not necessary [4].

In a recently published study they showed that silicone intubation has good, long-term success for relief of epiphora in patients with presumed functional NLDO [5]. Claudio A.C and others advocate a selective stenting approach, to reserve stenting for cases with tight common canaliculus opening as noted in surgery, and in treating failures. In their cases of anatomical NLDO, there were no differences between the routine stenting (94,7%) and selective stenting (100%) groups [6]. In another study on 50 patients with traumatic dacryocystitis and failed DCR cases who underwent DCR with bicanalicular silicon intubation, an overall success of 88% was achieved and hence they advocate stenting for these cases with high risk for surgical failure [7].

In our study, majority of the complications were self resolving or asymptomatic, except in 3 cases where they caused failure. The cause for failure was synechiae in 2 cases, and granulation in one case. The procedure of DCR is not associated with any major complications when performed meticulously. Granuloma formation, synechiae, excessive crusting, periorbital saline collection with emphysema due to false track while syringing, have been noted as minor delayed complications [7].

Though silicone is an inert substance, it is known to cause granulations, corneal and canalicular erosions, chronic infection, punctal slitting and canalicular lacerations, along with difficulty while insertion and removal [8]. But presently, as observed in our study, with proper surgical technique and good endoscopic follow up, the complication rate is much lower.

## Conclusion

There was no significant difference in the success rates of performing endonasal DCR with silicone stenting and without stenting. Hence we can conclude that routine intubation in DCR is not indicated.

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