

## Original Research Article

# Early bi-canalicular silicone stent intubation in failed DCR with endoscopic visualization: a combined approach

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### ABSTRACT

**Background:** Chronic dacryosystitis is a common condition affecting the eye and presenting to ENT surgeons and ophthalmologists, and treated with DCR (dacryocystorhinostomy). In few cases there can be recurrence of symptoms following DCR surgery which can be treated with bi-canalicular silicone intubation. The aim of this study is to assess the effectiveness of an early bi-canalicular silicone intubation in patients with failed DCR using endoscopic visualisation.

**Methods:** This was a prospective observational study. Thirteen cases of DCR operated for chronic dacryocystitis at St John's Medical College Hospital were reviewed between January 2014 and February 2017. Endoscopic DCR was done for five patients and external DCR for eight patients, number of males were 5 (38%) and females were 8 (62%). Age: 9–73 years (avg: 40.5 years).

**Results:** Nine patients had complete resolution of symptoms following the primary DCR (4 following external DCR and 5 following endonasal endoscopic DCR). Four patients had failed DCR with persistence of watering three months following primary DCR surgery. Re-DCR with bi - canalicular silicon stent intubation was done in failed cases. Postoperative follow up of all the four patients showed complete resolution of symptoms.

**Conclusions:** Failed DCR surgeries can be effectively intubated using bi-canalicular silicon tubes in the early postoperative period following DCR surgery. Silicone tube intubation is the most safe and cost effective method. Endoscopic visualization gives an added advantage of localizing the cause for a failed DCR.

**Keywords:** Dacryocystitis, Dacryocystorhinostomy, Endoscopic DCR, Bi-canalicular silicone intubation

### INTRODUCTION

The lacrimal system consists of a secretory portion and a drainage system. The secretory portion is made up of the lacrimal and accessory lacrimal glands which, together with the Meibomian glands and the goblet cells, secrete the components of the tear film. The accessory lacrimal glands produce basal tear secretion, and the lacrimal gland is largely responsible for reflex tearing in response to noxious or emotional stimuli. The drainage system consists of the lacrimal puncta, canaliculi, lacrimal sac

and nasolacrimal duct. This active system pumps tears from the conjunctival sac into the inferior meatus of the nose.

Epiphora from nasolacrimal system obstruction is either anatomic (70%) or functional (30%).<sup>1</sup> This includes complete blockages anywhere from the lacrimal punctum to the nasal cavity. Functional obstructions, on the other hand, are a result of either significant narrowing within the lacrimal system that delays normal lacrimal flow or a failure of the lacrimal pumping mechanism.

Dacryocystorhinostomy (DCR) is performed to relieve epiphora resulting from an obstruction of the nasolacrimal system. The majority of nasolacrimal system obstruction is unknown. Idiopathic obstruction is seen more frequently with increasing age and demonstrates a female preponderance. Less common causes include surgical trauma, facial trauma, granulomatous conditions such as Wegener's granulomatosis and sarcoidosis, malignancy, infections, and radiation exposure. It should be noted that while a significant number of patients suffer nasolacrimal injury after FESS (up to 15%), actual obstruction resulting in epiphora is very rare.<sup>2</sup>

Most of the patients have resolution of symptoms following surgery, few cases can have recurrence of symptoms even after surgery. These cases are usually treated by doing a bi-canalicular silicone tube stenting via nasal endoscopy.

The aim of this study is to assess the effectiveness of early bi-canalicular silicone stenting in failed cases following DCR surgery.<sup>3-5</sup> It was found to be very effective in our study with complete resolution of symptoms following stenting.

## METHODS

This was a prospective observational study. Thirteen cases of DCR operated for chronic dacryocystitis at St John's medical college hospital Bangalore were reviewed between Jan 2014 and Feb 2017. Endoscopic DCR was done for five patients and external DCR for eight patients.

### Selection criteria

#### Inclusion criteria

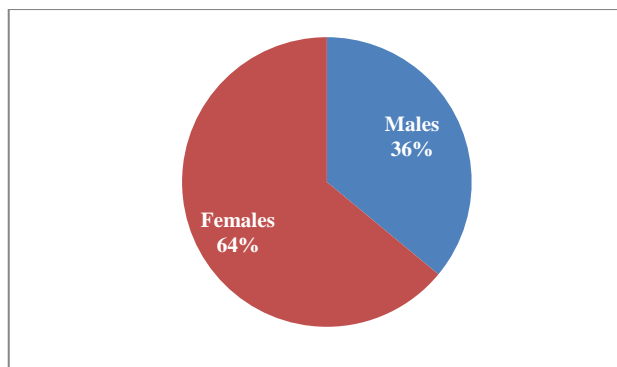
All chronic dacryocystitis patients who underwent DCR between January 2014 to February 2017 at our hospital were included in the study.

#### Exclusion criteria

All acute dacryocystitis patients and chronic dacryocystitis patients in whom symptoms resolved by lacrimal probing in the OPD and children less than 8 years were excluded from the study.

Males: 5 Females: 8. Age: 9 – 73 years (Avg: 40.5 years). Nine patients had resolution of symptoms following the primary DCR (4 following external DCR and 5 following endonasal endoscopic DCR).

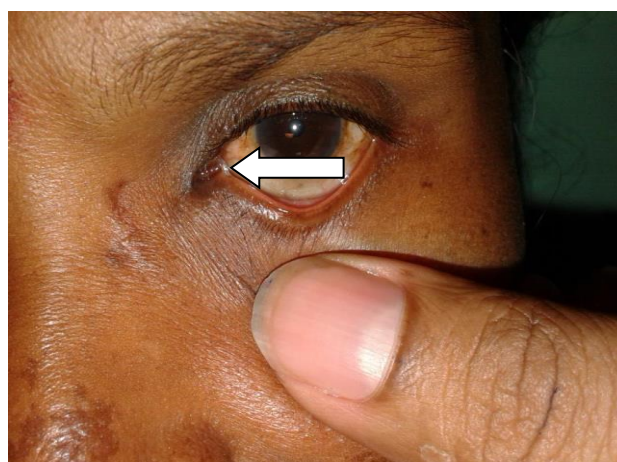
Four patients had failed DCR with persistence of watering three months following primary DCR surgery. Re-DCR with bi-canalicular silicon stent intubation was done in the failed cases.



**Figure 1: Distribution of cases according to sex.**

### Stenting procedure

The bi-canalicular silicon tubes were inserted from the upper and lower punctum and tied inside the nasal cavity in the event of failed DCR.



**Figure 2: Lacrimal stent in situ.**

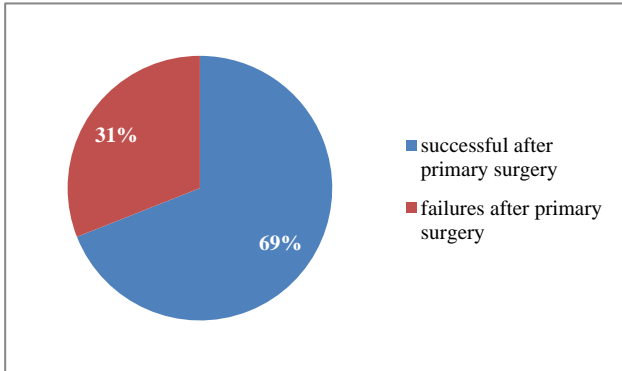
A combined approach using endoscopic visualization by the ENT surgeon and probing and insertion of the silicon tube by the Ophthalmologist was done. 3 of these stentings were done as an outpatient procedure, while one patient being a child underwent the stenting procedure under General anaesthesia. The stents were removed after follow up of 3 months with resolution of symptoms.

## RESULTS

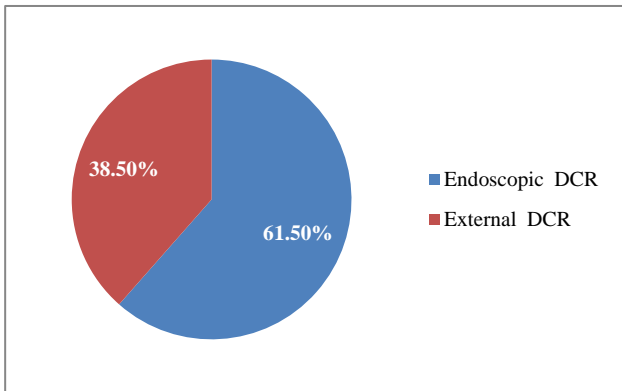
Total of 13 patients underwent DCR surgery of whom 4 had recurrence of symptoms following surgery. Early bi-canalicular silicone stent insertion was done in all 4 patients and it proved successful in all patients. Patency was established and there was no recurrence of symptoms (watering or discharge).

In our study, the cause for failure of DCR in 1 patient was presence of a bifid inferior turbinate (anatomical variation) causing nasolacrimal duct obstruction at its lower end (seen on CT) and confirmed by nasal

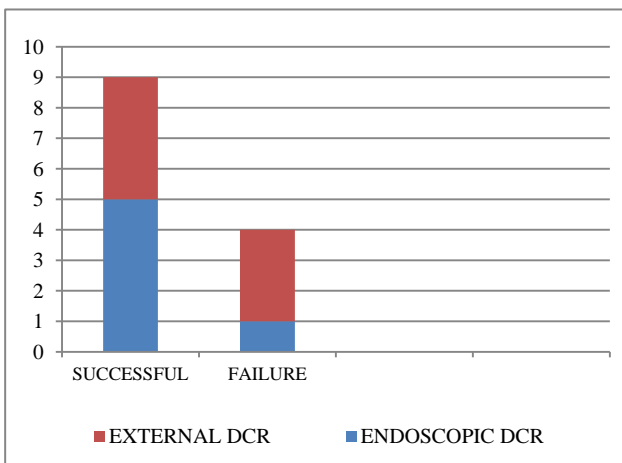
endoscopy, and in other 3 cases the cause is fibrosis secondary to chronic inflammation.



**Figure 3: Distribution of cases according to results after the primary surgery.**

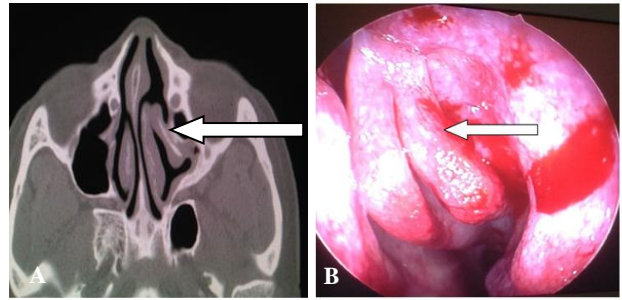


**Figure 4: Distribution of cases according to the approach (external vs. endoscopic).**

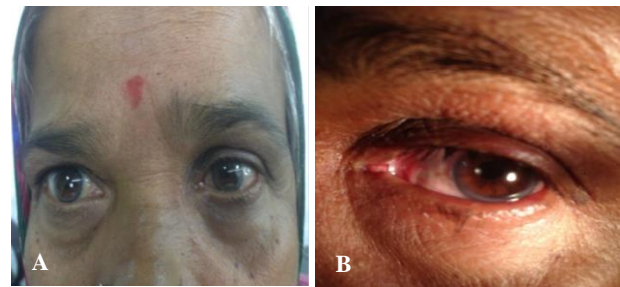


**Figure 5: Outcome of the study.**

Patient underwent turbinectomy along with bi-canalicular stenting. The added advantage of combined nasal endoscopy showed the presence of a bifid inferior turbinate which was the cause for failed DCR which is a rare anatomical variation. Post-operative outcome was good.



**Figure 6: (A and B): Preoperative CT picture endoscopic view of bifid inferior turbinate.**



**Figure 7: (A and B): Postoperative picture of a patient following removal of stent.**

## DISCUSSION

In this series of 4 failed DCRs, reoperation using the Endoscopic-DCR technique had an 100% success rate. Ari et al evaluated their 14 months of follow-up results of anatomical success and 78% both anatomical and functional success.<sup>9</sup> Our success rate is compatible with that of primary operated DCRs.<sup>10,11</sup>

After opening the lacrimal sac topical application of mitomycin c prevents fibrosis as it is a antiproliferative agent.<sup>12</sup> Silicone stent intubation along with mitomycin C applicator increases the success rate further in revision cases. Stents should be left in situ for longer duration in revision cases.<sup>13,14</sup> In our series we left the stent in situ for 6 weeks to improve the outcome.

Stenting done in early stages of failed DCR surgeries can improve the success rate of the revision surgery. With local anaesthesia this can be done as an outpatient procedure in adults with endoscopic visualization.

External DCR and Endo nasal endoscopic DCR have a high success rate (90%) and may not require routine stenting. However in the event of a failed DCR, silicon stenting may be required for canalization to enhance the rate of success. Mitomycin C application is the other option to prevent endonasal synechiae.<sup>15</sup>

## CONCLUSION

Dacryocystorhinostomy is the surgery of choice for nasolacrimal duct obstruction it is done by external or

endoscopic approach. In case of failure of primary surgery it is always advisable to do a revision DCR with bi canalicular stenting to improve the success of surgery. In our study silicone stent intubation has proven to be the most effective and safe surgical procedure in failed cases. Endoscopic visualization gives an added advantage of localizing cause for failure in revision cases.

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