

Original Research Article

A retrospective study analysis of success rate following endonasal dacryocystorhinostomy with stents

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ABSTRACT

Background: Endoscopic endonasal dacryocystorhinostomy (EN DCR) has now become a procedure of choice for nasolacrimal duct obstruction or in chronic dacryocystitis. Lots of debate is still going on regarding stent placement following surgery. The purpose of this study is to analyse the subjective and objective success following EN DCR with stents.

Methods: In this single centre study, 30 patients underwent EN DCR surgery from May 2011 to March 2013, out of those 20 eligible patients with 26 nasolacrimal duct obstructions underwent EN DCR with stents, and they were included in the study. Success rates were determined with subjective assessment of the patient symptoms and objective evaluation by lacrimal syringing.

Results: 80.7% patients underwent primary surgery and 19.2% patient's revision surgery, overall success rates was 88.4% out of which 95.2% success rate for primary surgery and 60% success rates of revision surgery. 11.5% of patients complained of persistent symptoms and success rate of ENDCR with stents was observed in 95.2% of patients after primary surgery and in 60% of patient's after revision surgery. Stent removal was done on 4-6 weeks (mean duration- 5 weeks) and patients follow up time was 6 months.

Conclusions: Whether to stent or to not still remain a topic of debate in EN DCR surgery, however ENDCR with stents represents the procedure of choice for treating nasolacrimal duct obstructions.

Keywords: Endonasal dacryocystorhinostomy, Stents, Endoscopic DCR, Epiphora

INTRODUCTION

Dacryocystorhinostomy (DCR) is a procedure performed to drain the lacrimal sac in cases of Nasolacrimal duct obstruction (NLDO) or in chronic dacryocystitis.¹ The endonasal approach was first described in 1893 by Caldwell, but was not commonly performed because of poor visibility and limited access to the endonasal anatomy.² After the advent of rigid endoscopes, it gained popularity with the first clinical study being published by McDonough and Meiring in 1989.³ Several variations of endonasal dacryocystorhinostomy (EN DCR) have been described, using mucosal flaps, monocanalicular or bicanalicular tubes, and application of Mitomycin C.^{4,5}

Different ways to create the rhinostomy with different types of lasers have also been examined.^{6,7} The main concerns in endonasal DCR are about long term patency and osteotomy closure by granulation tissue.⁸ Various authors have tried placement of stent to avoid post-operative scarring, neo ostium closure, synechia formation.⁹ Different type of stents such as silicon single channel, silicon double channel, polyurethane and prolene stents have been used. The main purpose of this study is to analyse the subjective and objective success following EN DCR with stents by subjective assessment of patient symptoms and objective assessment by lacrimal syringing.

METHODS

A retrospective study was conducted in the department of ENT, Rajarajeswari Medical College and hospital, Bangalore. The data was retrieved from the medical records department with the permission of institutional ethical committee and collected data was analyzed using Microsoft excel. A total of 30 patients underwent EN DCR surgery during May 2011 to March 2013, out of which, 20 eligible patients with 26 nasolacrimal duct obstructions were stented. We included patients with nasolacrimal duct obstruction without canalicular stenosis with a minimum follow-up of 6 months. These patients underwent testing of the lacrimal drainage by syringing and an endoscopic examination of the nasal cavity. Patients with failed external or endonasal dacryocystorhinostomy were also included in the study. The patients with common canaliculus blockage, other causes of watering in eyes, radiation therapy to the head and neck area, post-traumatic bony deformity or bone diseases affecting the nose and orbit were excluded from the study. Stent removal was performed at 4-6 weeks for most patients (mean duration- 5 weeks). Success rate was determined by subjective assessment of the patient symptoms and objective evaluation was done by lacrimal syringing after 6 months of surgery.

The preoperative evaluation included an ophthalmologic examination with lacrimal duct probing and irrigation and diagnostic nasal endoscopy. Informed written consent was taken prior to surgery and pre anaesthetic work up was done for the patients. Nasal cavity was packed with 4% Xylocaine with 1:100000 adrenaline half an hour before the start of operation.

All the patients were operated under general anaesthesia and the surgical technique used has been extensively described in literature and by PJ Warmold.^{10,11} The patient is placed in a supine position with the head slightly elevated to decrease the venous pressure at the operation site. Local infiltration was given with 2% lidocaine and 1: 80,000 adrenaline. With the help of 0^o 4mm karl storz rigid endoscope lateral nasal wall was visualized and vital structures like apex of the middle turbinate, uncinata process was identified; C shaped incision was made on the lacrimal bone area of lateral nasal wall using a sickle knife. Upper part of incision was made approximately 8-10 mm over the attachment of middle turbinate. Mucosal flaps were raised over frontal process of maxilla and Kerrisons straight and up turn bone punches was used to remove the bone and expose lacrimal sac. Medial wall of the sac was incised with sickle knife and is partially or completely removed. The lacrimal sac was examined and irrigated, and existing debris and pus were removed. Intubation of both canaliculi with placement of bicanalicular silicone tubes was carried out in all patients and nasal packing was done.

In postoperative period all the patients were treated with a 10-day course of topical ophthalmic antibiotic drops, systemic injectable antibiotics for 3 days and nasal pack removal after 24-48 hrs. Follow up was done at 2st week, 6th week and 6 months and Silicone tubes were removed at 4-6 weeks for most patients (mean duration- 5 weeks) after the operation.

Evaluation of success was done at 6 months after surgery. Subjective assessment was done by grading patient's symptoms into 2 categories: (a) no relief and (b) complete relief and objective assessment was done by doing lacrimal syringing and categorising it into: (I) Patent: when no resistance to the flow of fluid was seen while passing through the sac to the nasopharynx. (II) Non patent: when fluid regurgitated through upper punctum and no fluid passed through the nasopharynx. (III) Failure of EN DCR: when both, patient's persistent symptoms and a non-patent lacrimal syringing coexisted.

RESULTS

A total of 20 eligible patients, with 26 nasolacrimal duct obstructions underwent EN DCR with stents. In our study mean age group of the patients were between 41-50 years, Left eye was affected in 53.8% of patients and right eye was affected in 46.2% of the patients. Out of 20 patients 6 patients had bilateral dacryocystitis and 14 patients had unilateral dacryocystitis. 70% of the patients were females, and 80.7% of nasolacrimal duct obstructions underwent primary surgery and 19.2% underwent revision surgery.

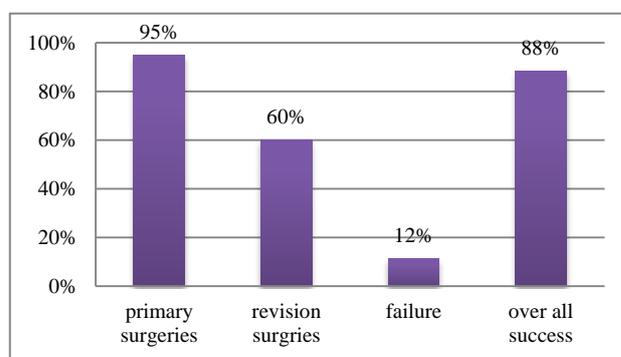


Figure 1: Overall success rates after 6 months.

Objective assessment was done with lacrimal syringing. In primary surgeries at 6th week 100% syringing patency was seen and at 6th month 95.2% syringing patency was seen. Overall success rate for primary surgeries were 95.2%. In revision surgeries at 6th week and 6th month 60% syringing patency was seen. Overall syringing patency for primary and revision surgeries was 88.4%.

Subjective assessment was done considering patient symptoms i.e. no relief or complete relief from symptoms. In primary surgeries at 6th week 100% symptomatic relief was seen and 6 month follow up

showed 20 patients had complete relief from symptoms. Overall symptomatic relief for primary surgeries were 95.2%. In revision surgeries at 6th week and 6th month lacrimal syringing 3 patients had complete relief of symptoms i.e. overall 60% success rates. Overall 3 patients (11.5%) had persistent symptoms. EN DCR failure was seen in 3 patients in whom both persistent symptoms with non-patent lacrimal syringing was found.

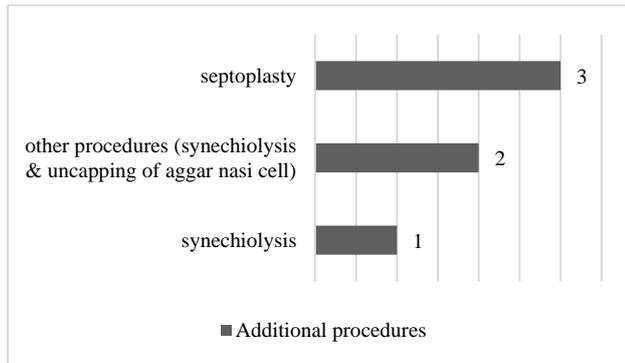


Figure 2: Additional procedures performed.

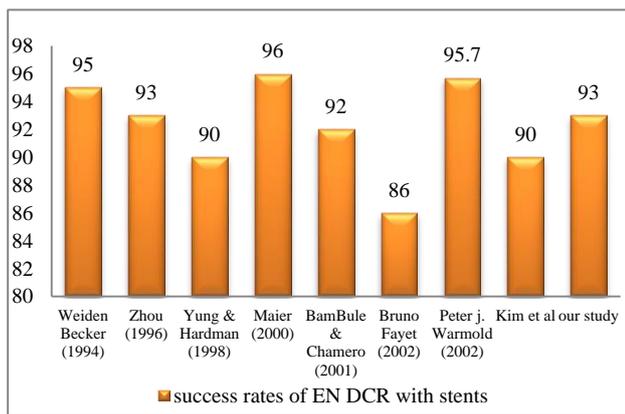


Figure 3: Literature review.

Table 1: Intraoperative and post-operative complications.

Complications	Number of patients (%)
Hemorrhage during surgery	0
Orbital fat exposure	0
Aggar nasi covering the lacrimal sac	1 (3.8)
Mucoid discharge	20 (76)
Post-operative bleeding	0
Post-operative adhesions	1 (3.8)
Granulations	2 (7.6)
Stent extrusion	0

DISCUSSION

Dacryocystorhinostomy is most commonly performed in cases of chronic dacryocystitis or in nasolacrimal duct obstruction. The main purpose of the surgery is to remove

the point of obstruction and to establish normal tear flow. In our study of 20 patients, bilateral dacryocystitis was seen in 6 patients, 21 patients underwent primary surgery and 5 patients underwent revision surgery.

In our study most of the patients were in 4th decade of life (mean age group 41-50 years). Dagleish et al in their study stated that 35-40 years was the earliest expected age of onset of acquired idiopathic nasolacrimal duct obstruction.¹² Jacobs et al in his study found the maximum incidence of this condition between 40-55 years of age.¹³ Our study results are similar to those quoted by most of the authors. 70% of the females were affected in our study, according to Elder et al while the disease in the new born affects both the sexes equally, its occurrence among adults is in the ratio of 75-80% females to 25-30% males.¹⁴ It can be attributed to low socio economic status, bad personal hygiene, exposure to smoke in kitchen and congenital anatomical narrowing of nasolacrimal drainage system.¹⁵

Left eye was involved in 53.8% of patients. It has been found that nasolacrimal duct and sac forms a greater angle on right side than left side, therefore more stasis of tears and predisposition to infection. Jacobs et al in his study found that right side was affected 53 times and the left side 37 times in 90 unilateral cases and only 14 cases were bilateral.¹³ Dagleish et al stated that there was no significant difference in right sided and left sided affection, and that the incidence of bilaterality increases with age.¹²

All patients were followed up at least up to 6 months. Techniques such as probing, silicone intubation, and balloon dacryocystoplasty have also been used to recanalize the occluded nasolacrimal duct but the success rate of these methods at long-term follow-up was approximately 50% or less.¹⁶⁻¹⁹ Silicone intubation simultaneous with DCR was first described by Gibbs et al.²⁰ Although no definitive time frame for stent retention has been established, it has been suggested that the silicone stent should remain in place for 6 to 12 months following surgery.²¹ Keeping the stents in place for a longer period of time is not advised, because it may induce a foreign body reaction and granulation tissue formation at the neo-ostium.

Success rates of primary surgery was 95.2%, in our study revision ENDCR was less successful than primary surgery. Our results of salvage ENDCR are comparable with those of other published series, which vary between 50% to 76.5%.^{22,23}

Several additional procedures were performed in our study along with EN DCR, septoplasty was performed in 3 cases for septal deviation, synechiolysis, inferior turbinate reduction & uncapping of Aggar nasi cell was done for 1 patient each. Additional procedures are carried out mainly to view the area to be operated. Septoplasty was described in up to 30% of ENDCRs in the literature,

and resection of the middle turbinate in up to 21%, synechiae formation can occur in up to 37.5% of cases and can impair lacrimal drainage in up to 40%.²⁴⁻²⁶ Synechiae formation between the ostium and the septum or the middle turbinate is known to be a major cause of failure in EN DCR. Uncinectomy, which is becoming more and more common, helps orient the surgeon in light of the variability of the endonasal structures, helps standardize ENDSCR, and provides safe access to the lacrimal fossa. To prevent synechiae formation, weekly decrusting of the nasal fossa by endoscopy until the third postoperative week. As described in the literature, postoperative nasal endoscopy is important for identifying iatrogenic nasal mucosal disease, preventing complications, avoiding recurrences, and assessing the subjective outcome.^{27,28}

CONCLUSION

Because of the possibility of treating concomitant sinonasal disorders, the cosmetic advantages, and the excellent results, ENDSCR represents the procedure of choice for treating nasolacrimal duct obstructions. Alone stent placement don't help in restoring the normal tear flow mechanism other factors such as size of the rhinostomy and presence of infection also play an important role in success of endonasal DCR. Whether to stent or to not still remain a topic of debate in EN DCR surgery despite approval of literature, however ENDSCR with stents represents the procedure of choice for treating nasolacrimal duct obstructions.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Harvinder S, Rosalind S, Philip R. Powered Endoscopic Dacryocystorhinostomy with Mucosal Flaps without Stenting. *Med J Malaysia.* 2008;63(3):237-8.
- Caldwell GW. Two new operations for obstruction of the nasal duct, with preservation of the canaliculi, and with an incidental description of a new lacrimal probe. *Am J Ophthalmol* 1893;10:189-93.
- McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. *J Laryngol Otol.* 1989;103:585-87.
- Smimov G, Tuomilehto H, Teräsvirta M, Nuutinen J, Seppä J. Silicone tubing after endoscopic dacryocystorhinostomy: is it necessary? *Am J Rhinol.* 2006;20:600-2.
- Tsirbas A, Wormald PJ. Endonasal dacryocystorhinostomy with mucosal flaps. *Am J Ophthalmol.* 2003;135:76-83.
- Sadiq SA, Ohrlich S, Jones NS, Downes RN. Endonasal laser dacryocystorhinostomy — medium term results. *Br J Ophthalmol.* 1997;81:1089-92.
- Ressiniotis T, Voros GM, Kostakis VT, Carrie S, Neoh C. Clinical outcome of endonasal KTP laser-assisted dacryocystorhinostomy. *BMC Ophthalmol.* 2005;5:2.
- Roozitalab MH, Amirahmadi M, Namazi MR. Results of the application of intraoperative Mitomycin C in dacryocystorhinostomy. *Eur J Ophthalmol.* 2004;14(6):461-3.
- Zolli CL, Shanon GM. Dacryocystorhinostomy-A review of 119 cases. *Ophthalmic surgery* 1982;13:905-10.
- Nussbaumer M, Sehreiber S, Yung MW. Concomitant nasal procedures in endoscopic dacryocystorhinostomy. *J Laryngol Otol* 2004;18:267-9.
- Wormald PJ. Powered endoscopic dacryocystorhinostomy. *Laryngoscope.* 2002.112(1):69-72
- Dalgleish R. Idiopathic acquired lacrimal drainage obstruction. *Br J Ophth,* 1967;51:463-8.
- Jacob Basil H. Symptomatic Epiphora. *Br J of Oph.* 1959;43:415-34.
- Duke Elders S. Disease of lacrimal passages. *System of ophthalmology.* Vol. XIII part-II. Mosby publication; 1974: 625-724.
- Sing M, Jam V, Gupta SC, Sing SP. Intranasal endoscopic DCR in cases of dacryocystitis. *Ind J Otolaryngolol Head Neck Surg.* 2004;56(3):177-83.
- Bell TA. An investigation into the efficacy of probing the nasolacrimal duct as a treatment for epiphora in adults. *Trans Ophthalmol Soc U K.* 1986;105:494-7.
- Angrist RC, Dortzbach RK. Silicone intubation for partial and total nasolacrimal duct obstruction in adults. *Ophthal Plast Reconstr Surg.* 1985;1:51-4.
- Lee JM, Song HY, Han YM, Chung GH, Sohn MH, Kim CS, et al. Balloon dacryocystoplasty: results in the treatment of complete and partial obstruction of the nasolacrimal system. *Radiology.* 1994;192:503-8.
- Zeynep Y, Bülent Y, Müfit P. Treatment of Nasolacrimal Duct Obstruction with Polyurethane Stent Placement: Long- Term Results. *AJR.* 2002;179:491-2.
- Gibbs DC. New probe for the intubation of lacrimal canaliculi with silicone rubber tubing. *Br J Ophthalmol.* 1967;51:198.
- Mathew G, McGwin G, Boyle M. The Consequence of Premature Silicone Stent Loss after External Dacryocystorhinostomy. *Ophthalmology.* 2008;115(7):1241-4.
- Ben Simon GJ, Joseph J, Lee S, Schwarcz RM, McCann JD, Goldberg RA. External versus endoscopic dacryocystorhinostomy for acquired nasolacrimal duct obstruction in a tertiary referral center. *Ophthalmology.* 2005;112:1463-8.
- Tsirbas A, Davis G, Wormald PJ. Revision daeryocystorhinostomy:a comparison of endoscopic and external techniques. *Am J Rhinol.* 2005;19:322-5.

24. Fayet B, Racy E, Assouline M. Complications of standardized endonasal dacryocystorhinostomy with unciformectomy. *Ophthalmology*. 2004;11:837-45.
25. Fayet B, Racy E, Assouline M. Systematic unciformectomy for a standardized endonasal dacryocystorhinostomy. *Ophthalmology*. 2002;109:530-6.
26. Nussbaumer M, Sehreiber S, Yung MW. Concomitant nasal procedures in endoscopic dacryocystorhinostomy. *J Laryngol Otol* 2004;18:267-9.
27. Keerl R, Weber R. Dacryocystorhinostomy — state of the art, indications, and results [in German]. *Laryngorhinootologie*. 2004;83:40-50.
28. Minasian M, Otver JM. The value of nasal endoscopy after dacryocystorhinostomy. *Orbit* 1999;18:167-76.

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