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ORIGINAL ARTICLE

Comparison of Surgical Outcome in Endoscopic Dacryocystorhinostomy with and without Silicone Stent Placement: Comparative Case Analysis

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ABSTRACT

Objective: The purpose of this study was to compare the long-term surgical outcome in endonasal dacryocystorhinostomy (DCR) with and without silicon stent placement.

Materials and methods: A prospective comparative analysis of 66 patients who underwent primary endoscopic DCR with stenting (group I), revision endoscopic DCR with stenting (group II), and primary endoscopic DCR without stenting (group III) was done. Success was evaluated in the form of subjective and objective analysis with 6 months follow-up.

Results: Out of the 66 patients, 34 underwent silicon stent placement (group I), 5 patients in revision underwent endoscopic DCR with stenting (group II) as against 27 patients in whom DCR was done without stenting (group III). Out of 34 patients of group I, 32 (94.12%) showed complete recovery of symptoms, all 5 patients of group II (100%) and 22 patients in group III (84.48%) out of 27 showed complete recovery of symptoms at 6 months follow-up. Patients with stent placements showed a slightly higher rate of success as compared with patients without stenting (94.12%/100%/84.48%). There was, however, no statistical difference in the success rate between groups I and III ($p = 0.17$) and between groups II and III ($p = 0.78$).

Conclusion: Endoscopic DCR with stenting is the preferred treatment of choice in cases of chronic dacryocystitis, with higher success rate, minimal preoperative and postoperative complications. In the present study, advantages of stenting were that there was less hospital stay than without stenting and there was no need of long postoperative lacrimal syringing schedule which is important to maintain the neo-ostium to keep it patent, and without stenting it needed regular syringing for 3 months.

Keywords: Dacryocystitis, Endoscopic dacryocystorhinostomy, Epiphora.

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INTRODUCTION

Epiphora is a common annoying symptom that embarrasses the patient, both socially and functionally, and may even endanger the eye. It is in contradistinction to lacrimation, caused by the imperfect drainage of tears through lacrimal passage. Lacrimation occurs due to excessive tear production. Dacryocystitis represents acute and chronic inflammation of lacrimal sac. Chronic dacryocystitis is the most common cause of epiphora (87%).[1]

First attempt of endonasal DCR was described by Caldwell[2] and of external DCR was explained by Toti.[3] McDonogh and Meiring[4] described the first modern endonasal endoscopic DCR (EnDCR) procedure.

The aim of DCR surgery is not only to establish a free passage between lacrimal sac and nasal cavity but also to keep this passage patent. The long-term results are good though some failure has been reported that is most commonly attributed to stenosis or closure of rhinostomy. To overcome this, insertion of silicone stent is recommended.[5]

The most common causes of DCR failure are obstruction of the osteotomy site and obstruction of the common canaliculus (it has been thought that an adequately size osteotomy at the end of surgery would eventually narrow down to a final size of 2 mm due to scarring). Therefore, some authorities postulated that intubation of the nasolacrimal system during DCR may prevent closure and scarring of the osteotomy or stenosis of the common canaliculus and so may improve the success rate.[6]

Demirci and Elner[7] concluded that double silicone intubation is an effective minimally invasive technique for the treatment of partial lacrimal system obstruction in adults. Similar finding was seen in Indian population by Harugop et al.[8] The use of silicon intubation in nasolacrimal pathway helps in maintaining the patency of rhinostomy.

Insertion of silicon stent is almost universally employed to prevent rhinostomy stenosis and to help to stabilize epithelization between two mucosal surfaces having surgical continuity.[9]

Silicon stents may lead to surgical failure by traumatic granulation tissue, punctual erosion, or slitting of the canaliculi.[10] In our study, we compared EnDCR done

in 66 patients with 27 patients with only conventional EnDCR and the other with 39 patients with EnDCR and silicone tube stents.

MATERIALS AND METHODS

This prospective study was conducted in the Department of Otorhinolaryngology—Head and Neck Surgery, Indira Gandhi Medical College, Shimla, India, from July 2014 to June 2015.

Patients of either sex, having symptom and signs suggestive of chronic dacryocystitis, were enrolled in the study. Informed consent was obtained. Detailed evaluation of patient including history and ophthalmic examination including visual acuity and sac syringing was done. Thorough clinical evaluation of nose and paranasal sinuses (PNSs) was done to rule out any nasal and paranasal causes of duct obstruction. Routine blood investigation, X-ray PNS, and anterior rhinoscopy were done. Systemic evaluation and fitness for surgery was obtained for local anesthesia and general anesthesia.

Out of 66 patients, 34 underwent silicon stent placement (group I), 5 patients had revision endoscopic DCR with stenting (group II) as against 27 patients in which DCR was done without stenting (group III).

A curvilinear incision in the shape of a "C" was made on the lacrimal bone area of the lateral nasal wall using a sickle knife. The "C" opens posteriorly and the two horizontal limbs are superior and inferior. The upper limb of the incision lies approximately 2 mm above the attachment of middle turbinate. The vertical part lies 2 to 4 mm anterior to the maxillary line and the lower limb curves posteriorly, thus creating a posteriorly based mucoperiosteal flap. The flap was elevated with the help of a Freer's elevator and lacrimal bone was exposed. The lacrimal bone was perforated with Kerrison DCR punch forceps. The starting point of the perforation was at the maxillary line. Once a sufficient opening was made, the lacrimal bone was removed with the Kerrison's punch. The bony dehiscence was felt at lacrimal sac area.

The lacrimal syringing was done with betadine diluted with normal saline by the assistant after dilating the lower puncta by punctum dilator and free flow of fluid observed endoscopically. A silicon tube stent (Fig. 1) was inserted through lower and upper punctum and was taken out from the nasal cavity (Fig. 2). Medicated nasal packing was done on the side of procedure and it was removed next day. Stent was removed after 3 months. Follow-up examination was done under endoscope by the same surgeon.

We followed up the patients immediately after removal of stent, after 1 month, and finally after 3 months. Surgical outcome was evaluated both subjectively and objectively. In subjective assessment, patients were asked for epiphora relief in 5-point scale system: symptom free, significantly improved, slightly improved, no improvement, and worse. They were asked whether they were disturbed by silicone tube stent. Any declaration of improvement by the patient was considered as success. The objective assessment was done by syringing test of the eye, presence of any granulation tissue at puncta, result of regurgitation test by giving pressure over lacrimal sac.

RESULTS

All data were expressed in numerical value as mean ± standard deviation. All the analysis was done using the IBM Statistical Package for the Social Sciences, version 16.0 software. Baseline values were compared individually and Chi-square/Fisher's exact tests were used for statistically analysis. For all statistical tests, p-value < 0.05 was considered to be statistically significant.

In the present study, 83.33% belonged to poor socioeconomic group and 16.66% were in good socioeconomic group. The difference was statistically significant (p = 0.02). In our study, age group ranged from 7 to 70 years. The youngest patient was 7 years and oldest was 70 years. In the present study, overall sex distribution showed a female preponderance of 69.69%; only 30.31% were males.

In the present study, the duration of epiphora was more for <1 year (51.51%) in all groups and minimum

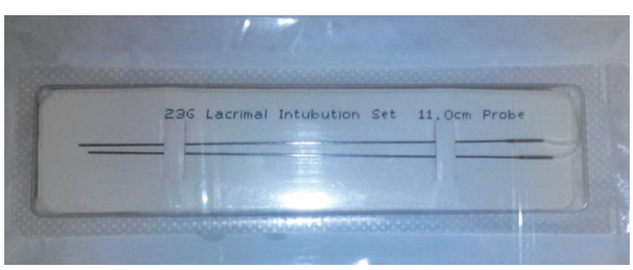


Fig. 1: Silicone stent used in the study

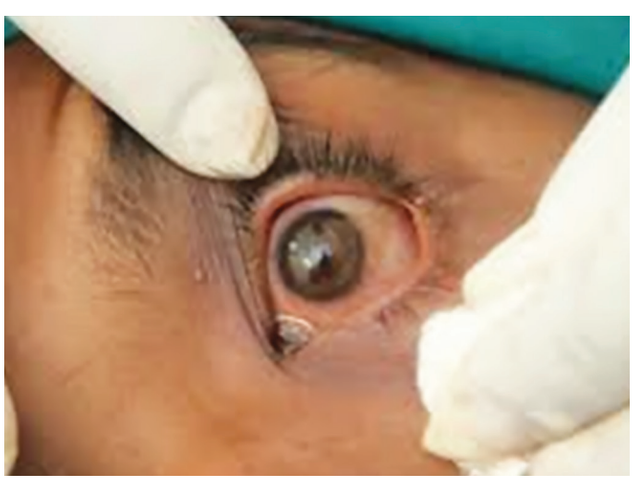
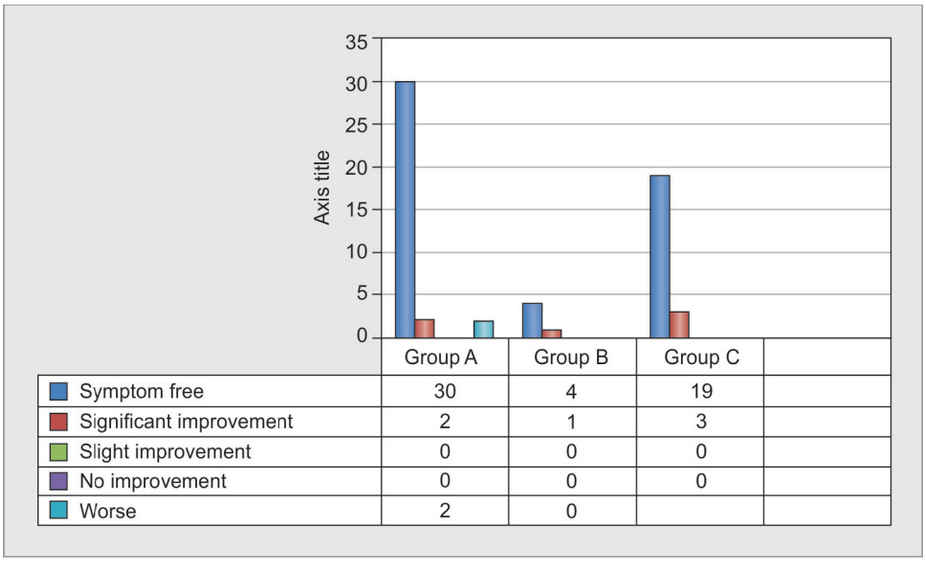


Fig. 2: Silicone stent in both punctum

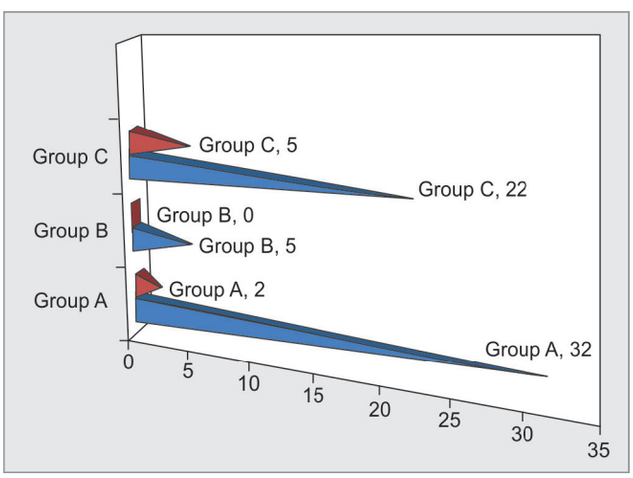


Graph 1: Subjective evaluation

for >2 years (18.18%). In this study, we did not observe any intraoperative complication in the form of hemorrhage. We observed totally six cases (9.10%) with postoperative complication in the form of periorbital edema. Out of six cases, four were in group I and two in group III.

In the present study, subjectively a 5-point scale was used to grade the degree of epiphora relief. In group I, 30 patients (88.24%) were symptom free, 2 patients (5.89%) reported significant improvement, and 2 patients (5.89%) had no improvement; in group II, 4 patients (80.00%) were symptom free and 1 patient (20.00%) reported significant improvement; and in group III, 19 patients (70.37%) were symptom free, 3 patients (11.11%) reported significant improvement, and 5 patients (18.52%) had no improvement in symptoms. The p-value between groups I and II was 0.17, and between groups II and III was 0.78. These were statistically insignificant (Graph 1).

In objective assessment, in group I, 32 patients (94.12%) had patency in syringing test with no granulations at punctum and absence of regurgitation test, 2 patients (5.89%) had failed patency with no granulations at punctum and presence of regurgitation test. In group II, all 5 patients (100%) had patency in syringing test with no granulations at punctum and absence of regurgitation test. In group III, 22 patients (84.48%) had patency in syringing test with no granulations at punctum and absence of regurgitation test, 5 patients (18.51%) had failed syringing with no granulations at punctum and presence of regurgitation test (Graph 2).



Graph 2: Objective evaluation

DISCUSSION

The EnDCR is indicated for congenital and acquired nasolacrimal duct obstruction. It is the most common surgical procedure carried out for nasolacrimal drainage system obstruction. It has high success rate with limited follow-up and is also cost-effective (Table 1).[4]

Chronic dacryocystitis is more common in women of low socioeconomic group due to their bad personal habits, long duration of exposure to smoke in kitchen, and dust in the external environment. Other possible causes are congenital and anatomical narrowing of nasolacrimal drainage system in females as compared with males.[11] Inadequate removal of bone is the commonest cause of postoperative stromal stenosis.[12] Silicon tube stent maintains the patency of fistula during postoperative healing period.[13]

The size of the bony ostium and the extent of the sac exposure are important factors in determining postoperative patency of the newly created ostium.[14,15] The success rate in this present study was 94.12% in group I (primary endoscopic DCR with stenting), 100% in group II (revision endoscopic DCR with stenting), and 84.48%

Table 1: The reported success rates of EnDCR vary between 83 and 96%

Author	*Procedure*	*Result %*	*Appraisal/comments*
Cokkeser et al[16]	Gr-1: EXT DCR	89.5	Success defined as resolution of epiphora
	Gr-2: EnDCR without stent	88.2	
Fayet et al[17]	EnDCR with stent	86	Anterior resection of uncinate in all cases and partial resection of middle turbinate optional
Unlu et al[18]	Gr-1: EnDCR with silicon intubation	85.7	Evaluation included subjective and objective tools. No randomization
	Gr-2: EnDCR without silicon intubation	81.3	
Singh et al[11]	EnDCR without stent	96	Successful in atrophic rhinitis and other nasal and paranasal diseases
Present study	Gr-A: primary EnDCR with stenting	94.12	Only postsaccal stenosis cases
	Gr-B: revision EnDCR with stenting	100	Randomized study
	Gr-C: primary EnDCR without stenting	84.48	Evaluation included subjective and objective tools

in group III (primary endoscopic DCR without stenting). The p-value between groups I and II was 0.17, and between groups II and III was 0.78. These were statistically insignificant.

CONCLUSION

In the present study, advantages of stenting were that there was less hospital stay than without stenting and there was no need of long postoperative lacrimal syringing schedule, which is important to maintain the neo-ostium to keep it patent, and without stenting, it needed regular syringing for 3 months. Considering the higher success rate of EnDCR with stenting compared with EnDCR without stenting, together with minimal risk from stenting, we recommend that EnDCR with stenting be the preferred treatment of choice in cases of chronic dacryocystitis secondary to postsaccal stenosis. A large-scale randomized control trial is necessary for further evaluation.

REFERENCES

1. Jacobs HB. Symptomatic epiphora. Br J Ophthalmol 1959 Jul;43(7):415-434.
2. Caldwell GW. Two new operations for obstruction of the nasal duct. N Y Med J 1893;57:581-582.
3. Toti A. Nuovo methodo conservatore di cura radicale delle suppurazioni croniche del sacco lacrimale (Dacriocistorinostomia). Clin Mod Firenze 1904;10:385-387.
4. McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. J Laryngol Otol 1989 Jun;103(6):585-587.
5. Allen K, Berlin AJ. Dacryocystorhinostomy failure: association with nasolacrimal silicon intubation. Ophthalmic Surg 1989 Jul;20(7):486-489.
6. Zolli CL, Shannon GM. Dacryocystorhinostomy: a review of 119 cases. Ophthalmic Surg 1982 Nov;13(11):905-910.
7. Demirci D, Elner VM. Double silicone tube intubation for the management of partial lacrimal system obstruction. Ophthalmology 2008 Feb;115(2):383-385.
8. Harugop AS, Mudhol RS, Rekha BK, Maheswaran M. Endonasal dacryocystorhinostomy: a prospective study. Indian J Otolaryngol Head Neck Surg 2008 Dec;60(4):335-340.
9. Sadiq SA, Ohrlich S, Jones NS, Downes RN. Endonasal laser dacryocystorhinostomy-medium term results. Br J Ophthalmol 1997 Dec;81(12):1089-1092.
10. Tripathi A, Lesser J, O'Donnel NP, White S. Local anaesthetic endonasal endoscopic laser dacryocystorhinostomy: analysis of patients' acceptability and various factors affecting the success of this procedure. Eye (Lond) 2002 Mar;16(2):146-149.
11. Singh M, Jain V, Gupta SC, Singh SP. Intranasal endoscopic DCR (END-DCR) in cases of dacryocystitis. Indian J Otolaryngol Head Neck Surg 2004 Jul;56(3):177-183.
12. Yung MW, Hardman-Lea S. Endoscopic interior dacryocystorhinostomy. Clin Otolaryngol Allied Sci 1998 Apr;23(2):152-157.
13. Kakkar V, Chugh JP, Sachdeva S, Sharma N. Endoscopic dacryocystorhinostomy with and without silicone stent: a comparative study. Int J Otorhinolaryngol 2009;9:1.
14. Wormald PJ. Powered endonasal dacryocystorhinostomy. Laryngoscope 2002 Jan;112(1):69-72.
15. Mann BS, Wormald PJ. Endoscopic assessment of the dacryocystorhinostomy ostium after endoscopic surgery. Laryngoscope 2006 Jul;116(7):1172-1174.
16. Cokkeser Y, Evereklioglu C, Er H. Comparative external versus endoscopic dacryocystorhinostomy: results in 115 patients (130 eyes). Otolaryngol Head Neck Surg 2000 Oct;123(4):488-491.
17. Fayet B, Racy E, Assouline M. Systematic unciformectomy for a standardized endonasal dacryocystorhinostomy. Ophthalmology 2002 Mar;109(3):530-536.
18. Unlu HH, Toprak B, Aslan A, Guler C. Comparison of surgical outcomes in primary endoscopic dacryocystorhinostomy with and without silicon intubation. Ann Otol Rhinol Laryngol 2002 Aug;111(8):704-709.