International Journal of Otorhinolaryngology and Head and Neck Surgery
Pandey R et al. Int J Otorhinolaryngol Head Neck Surg. 2018 Jan;4(1):137-140
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20175614

Outcome of primary endoscopic dacrocystorhinostomy with and without stent: a randomised prospective study

Rajesh Pandey[1], Pramod Kumar Yadav[1]*, Amit Kumar Patel[2], Poonam Rani[3]

[1]Department of ENT, [2]Department of Ophthalmology, [3]Department of Pathology, Govt Medical College, Ambedkarnagar, Uttar Pradesh, India

Received: 10 August 2017
Revised: 13 September 2017
Accepted: 16 September 2017

***Correspondence:**
Dr. Pramod Kumar Yadav,
E-mail: drpkyadav853@gmail.com

ABSTRACT

Background: The introduction of endoscopes with different degrees of angulation for endoscopic sinus surgery led to widespread use of endoscopic endonasal DCR (EDCR). The results of EDCR are not only encouraging, but are associated with many other additional advantages. Many modifications like LASER assisted endoscopic DCR, use of silicon tube for stenting, mitomycin-C application etc. have been described. However, insertion of silicon stent in endonasal DCR is most commonly used procedure. Many surgeons claim that use of silicon stent improves success rate of endoscopic DCR. On the other hand, some studies indicate that silicon stent itself is a reason for surgical failure. The present study was done to compare surgical outcome and complication of endoscopic DCR with and without silicon stent.
Methods: 70 cases (total 90 EDCR) randomly taken for study. In 35 EDCR cases lacrimal stent were used and in 55 EDCR cases stent were not used. Success rate in both group was analysed using chi-square test. P value <0.05 was considered as significant.
Results: We found a success rate of 90.9% and 85.7% for group A (stent not used) and group B (stent used) respectively. The statistic evaluation among these groups does not show any significant difference (p=0.445) which means that insertion of stent in cases of primary EDCR does not significantly change the surgical outcome.
Conclusions: Endonasal DCR without silicon stent is considering as effective, safe and minimally invasive primary procedure for treatment of nasolacrimal duct obstruction. Role of using stent in primary EDCR is not very promising because it is not improving the outcome of surgery.

Keywords: Endonasal DCR, Silicon stent, Epiphora

INTRODUCTION

Dacrocystorhinostomy (DCR) is a surgical procedure which involves diversion of lacrimal flow into nasal cavity by creating an opening at the level of lacrimal sac. DCR addresses the obstruction of lacrimal secretion at the level of lacrimal sac and nasolacrimal duct. There are several causes of obstruction, such as trauma, infections, neoplasms, or systemic diseases, although the vast majority of cases are due to idiopathic inflammation.[1]

This operation can be performed by both external and intranasal approach. This was first described via an external approach by Toti in 1904.[2] The first intranasal DCR was described by Caldwell in 1983.[3] In 1989, McDongh and Meiring described the endoscopic transnasal DCR.[4] The introduction of endoscopes with different degrees of angulation for endoscopic sinus surgery led to widespread use of endoscopic endonasal DCR (EDCR). The results of EDCR are not only encouraging, but are associated with many other additional advantages e.g. avoidance of facial scar,

preserves the pumping mechanism of orbicularis oculi muscle, better visualisation resulting in less intraoperative trauma and blood loss, reduced operative time, simultaneous nasal surgeries for other nasal pathologies are possible and revision DCR is easy.[5] Lacrimal abscess in acute phase can be operated endoscopically. This is one of the most important advantages of endoscopic DCR. Many modifications like LASER assisted endoscopic DCR, use of silicon tube for stenting, mitomycin-C application etc. have been described. However, insertion of silicon stent in endonasal DCR is most commonly used procedure.[6] Many surgeons claim that use of silicon stent improves success rate of endoscopic DCR. On the other hand, some studies indicate that silicon stent itself is a reason for surgical failure.[7] The present study was done to compare surgical outcome and complication of endoscopic DCR with and without silicon stent.

METHODS

This study was conducted at Department of ENT, MRA Medical College, Ambedkar Nagar, UP from July 2015 to July 2016. Seventy cases were selected from outpatient department of ENT and ophthalmology who presented chronic epiphora regardless of age and gender. Out of 70 cases (49 female, 21 male) who underwent EDCR; of which 20 cases had undergone bilateral EDCR, so total 90 EDCR were performed. All patients were jointly evaluated by ophthalmologist and otolaryngologist. Pre-operative evaluation consisted of standard relevant eye and ear-nose-throat (ENT) examination, including regurgitation test, irrigation of lacrimal pathway and endoscopic examination of nasal cavities.

Inclusion criteria

Epiphora due to nasolacrimal duct obstruction and chronic dacryocystitis.

Exclusion criteria

Absent both upper and lower punctum, lid laxity leading to displacement of punctum, previous lacrimal surgery, traumatic or congenital bony deformity

Informed consent was obtained by all selected patients. Other causes of epiphora were excluded. The patients were divided into two groups. Group A included 40 patients (15 cases bilateral; so total 55 EDCR) in which intra-operative lacrimal stent was not inserted. Group B included 30 patients (5 bilateral; so total 35 EDCR) where intra-operatively silicon stent was inserted. All patients were operated under local anaesthesia except 5 cases (age <15 years) general anaesthesia were used.

Surgical technique

The surgical procedure was similar in all patients. All procedures were performed by the same surgeon. The nose was packed with 4% xylocaine 10 minutes before surgery. After de-congestion of nasal mucosa, nasal cavities were examined by 0^0 rigid nasal endoscope attached to video camera. Those patients in which septal deformity was obstructing the view of operative site, endoscopic septoplasty was performed before starting DCR. 2% xylocaine with 1:100,000 adrenaline.was injected to the lacrimal sac area. A 'C' shaped incision was given with sickle knife on the lateral nasal wall along the maxillary line just anterior to the anterior end of middle turbinate. A posteriorly based mucosal flap was created using freer's elevator and frontal process of maxilla and lacrimal bone identified. Kerrisson punch was used to remove the bone and lacrimal sac was visualised. Medial wall of sac incised with help of sickle knife and by using endoscopic scissor medial wall of sac was removed. A window is made the mucosal flap in the region of sac and rest of mucosa repositioned. Lacrimal probing was done in every case. A bicanalicular silicon stent was put in Group B patients. In Group A patients silicon stent was not used. Nasal packing was done in those cases in which bleeding were anticipated. Mean time of surgery was 30 minutes in one side. Patient was discharged on third day postoperative day after removing nasal pack if used. Syringing was done just prior to discharge and subsequently at every follow up. Postoperatively oral antibiotic (amxycillin-clavulanic acid) and analgesic were given for 05 days. Antibiotic eye drop (Ciplrofloxacin-Dexamethasone) and nasal saline drops for 04 weeks. The patients were followed at interval of 1 week, 2 week, 1 month, 3 months and 6 month post-operatively and data were entered, stored, and analyzed using SPSS statistical software (version 16) using the chi-square test. $P<0.05$ was considered significant.

RESULTS

Seventy patients (49 female and 21 male) had undergone endoscopic DCR in which 20 cases were bilateral (so total 90 EDCR). Group-A (55 EDCR, where silicon stent was not used) included 29 female, 11 male and 15 cases bilateral. Group-B (35 EDCR, where silicon stent was put) included 20 female, 10 male and 5 bilateral cases. The age range of all cases was from 8 to 65 years with mean age 35.2 years (Table 1).

Epiphora was the predominant complain in all cases (100%), swelling of lacrimal sac in 8 patients (11.4%) and mucopurulent discharge from medial canthus in 6 patients (8.5%). No significant intraoperative complication was observed. Intra operative haemorrhage occur in 12 cases (17.1%) which required nasal packing. Post operatively ecchymosis in 9 cases (12.8%), eyelid edema in 6 patients (8.5%) and nasal bleeding in 4 cases (5.7%) was observed and managed conservatively (Table 2).

Complete relief of epiphora was observed in 50 (90.9%) out of 55 EDCR in Group-A and 30 (85.7%) out of 35 EDCR in group-B. 5 EDCR (9.1%) in group-A and 5

EDCR (14.3%) in group-B has procedure failure (Table 3).

Table 1: Demographic data of patients.

Characteristic	Total	%
Total number of patients	70	
Gender		
Male	21	30.0
Female	49	70.0
Female/male ratio	2.3:1	
Side of disease: unilateral	50	71.4
Bilateral	20	28.6
Age (years): Mean	35.2	
Range	8-65	

Table 2: Symptoms and complication observed.

characteristics	Number	%
Complains	70	100
Epiphora	8	11.4
Swelling of lacrimal sac mucopurulent discharge from medial canthus in 6 patients (8.5%)	6	8.5
Complications		
Intraoperative haemorrhage	12	17.1
Postoperatively ecchymosis,	9	12.8
Eyelid edema	6	8.5
Nasal bleeding	4	5.7

Table 3: Outcome recorded in both groups.

Outcome	Group A (stent not used)		Group B (stent inserted)	
	No.	%	No.	%
Total EDCR	55	61.1	35	38.8
Success rate	50	90.9	30	85.7
Failure rate	5	9.1	5	14.3

Common cause of failure was inadequate removal of upper part of ascending process of maxilla (60.0%), granuloma formation (20.0%) and fibrosis at neo-ostium (20.0%). All failed EDCR patients underwent repeat endoscopic surgery with silicon tube insertion but not included in study. Removal of crust and lacrimal syringing was done at every follow up. Silicon stent was removed on 3 month after surgery.

DISCUSSION

Majority (70%) of our cases were females. This trend is also noted in other studies.[5,8] Probable reason for this trend is narrow lumen of nasolacrimal duct.[9] Fifty patients (71.4%), in our study, had unilateral symptoms whereas 20 (28.7%) had bilateral symptoms. Similar trends were observed in other studies.

Our diagnostic protocol included regurgitation test, irrigation of lacrimal system and endoscopic endonasal examination. Various studies employed dacryocystography and computed tomography (CT) scan imaging.[5,8] Although these investigations can provide additional information in few selected cases, but routine use of these investigations are not required in majority of cases. Irrigation of the lacrimal system can establish correct diagnosis in majority of cases, and it is also an easy, safe and low cost investigation. An overall success rate of EDCR recorded in our study was 88.9% after 6 months of follow up. Success rate of external DCR is reported in literature 75 to 99% while success rate of EDCR without use of laser and with use of laser, little lower i.e. 77 to 83%.[7,10]

We found a success rate of 90.9% and 85.7% for group A and group B respectively. The statistic evaluation among these groups does not show any significant difference (p=0.445) which means that insertion of stent in cases of primary EDCR does not significantly change the surgical outcome. Review of relevant literature suggests that there is considerable controversy regarding the use of DCR tube. According to some authors, the best endonasal DCR results can be obtained with use of DCR tube.[8,11] Stent application, associated with topical antibiotic lavage, maintains the lacrimal system open and prevents infection, resulting in a successful outcome. Some authors do not favour use of silicon stent in primary EDCR because its use increase in occurrence of DCR stenosis, granulation tissue formation, patient discomfort and extra cost.[9,12] Many are of the opinion that use of stent does not affect the success of the procedure.[5,13] Success rate of different studies is summurised in Table 4.

Table 4: Comparison of success rate of different studies.

Authors	Year	Success rate		No. of EDCR procedure
		With stent (%)	Without stent (%)	
Unlu et al[14]	2002	85.7	87.5	30
Smirnov et al[15]	2008	78	100	46
Gupta et al[16]	2010	91.6	86.8 (with dilatation and probing) 97.1 (without dilatation and probing)	104
Al-Qahtani et al[17]	2012	96	91	173
Ahmad et al[18]	2016	93.3	87.5	30
Present study	2016	85.7	90.9	90

Our study showed that use of silicon stent in primary EDCR does not change the surgical outcome like other study.[14,15]

The optimal time for silicon tube extubation is another controversy. We planned to keep the DCR tube for 3 months after the surgery. We found premature extrusion of stent in one patient and adhesion of stent in flap in another patient which require endoscopic exploration and removal. In our study common causes of failure were inadequate removal of upper part of ascending process of maxilla (60.0%), granuloma formation (20.0%) and fibrosis at neo-ostium (20.0%). Other causes of failure of EDCR are failure to localise lacrimal sac, insufficient osteotomy, bone neogenesis and insufficient opening of lacrimal sac.

CONCLUSION

Endonasal DCR without silicon stent is consider as effective, safe and minimally invasive primary procedure for treatment of nasolacrimal duct obstruction. Role of using stent in primary EDCR is not very promising because it is not improving the outcome of surgery rather it has been found cause granulation formation, add costs to surgery, discomfort to patient and sometime removal is painful. Regular follow up are require to the process of wound healing and early detection of complication leading to failure of procedure.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ilgit ET, Onal B, Coskun B. Interventional radiology in the lacrimal drainage system. Eur J Radiol. 2005;55(3):331-9.
2. Toti A. Nuovo Metodo conservatore dicura radicale delle suppurazione croniche del sacco lacrimale (dacricistorhinostomia). Clin Mod (Firenze). 1904;10:385-9.
3. Caldwell G. Two new operations for obstruction of the nasal duct, with preservation of the canaliculi, and with an incidental description of a new lachrymal probe. Am J Ophtalmol. 1893;10:189-93.
4. McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. J Laryngol Otol. 1989;103(6):585-7.
5. Muscatello L, Giudice M, Spriano G, Tondini L. Endoscopic dacryocystorhinostomy: personal experience. Acta Otorhinolaryngol Ital 2005;29:209-13.
6. Oneci M, Orhan M, Ogretmenoglu O, Iruec M. long term results and reasons for failure of intransal endoscopic dacrocystorhinostomy. Acta Otolaryngol. 2000;120(2):319-22.
7. Allen K, Berlin AJ. Dacryocystorhinostomy failure: association with nasolacrimal silicone intubation. Ophthalm Surg. 1989;20:486-9.
8. Hartikainen J, Antila J, Varpula M, Puukka P, Seppa H, Grenman R. Prospective randomized comparison of endonasal endoscopic dacryocystorhinostomy and external dacryocystorhinostomy. Laryngoscope. 1998;108:1861-6.
9. Shah Z, Hussain I, Khattak N, Iqbal M. A review of 144 cases of dacryocystorhinostomy. Pak J Opthalmol. 2009;25:89-92.
10. Mantymen J, Yoshitsugu M, Rautiamen M. Result of dacrocystorhinostomy in 96 patients. Acta Otolaryngol Sup (Stockholm). 1997;529:187-9.
11. de Souza C, Nissar J. Experience with endoscopic dacryocystorhinostomy using four methods. Otolaryngol Head Neck Surg. 2010;142:389-90.
12. Unlu HH, Gunhan K, Baser EF, Sonju M. Long-term results in endoscopic dacryocystorhinostomy: Is intubation really required? Otolaryngol Head Neck Surg. 2009;140:589-95.
13. Unlu HH, Ozturk F, Nutlu C, Ilker SS, Tarhan S. Endoscopic dacryocystorhinostomy without stents. AurisNasus Larynx. 2000;27:65-71.
14. Unlu HH, Toprak B, Aslan A, Comparison of surgical outcomes in primary endoscopic dacrocystorhinostomy with and without silicon intubation. Ann otol rhinol laryngol. 2002;118(8):704-9.
15. Smirnov G, Tuomilehto H, Teräsvirta M, Nuutinen J, Seppä J. Silicon tubing is not necessary after primary endoscopic dacrocystorhinostomy: a prospective randomized study. Am J Rhinol. 2008;22:214-7.
16. Gupta AK, Rijuneeta. Endoscopic dacrocystorhinostomy without probing: surgical outcome. Clin Rhinol: An Int J. 2010;3(2):77-80.
17. Al-Qahtani, Ali S. Primary endoscopic dacrocystorhinostomy with or without silicon tubing: a prospective randomized study. American J Rhinol Allergy. 2012;26:332-4.
18. Ahmad S, Pant B. Role of silicon stenting in endoscopic dacrocystorhinostomy: A comparative study. Int J Adv Integ Med Sci. 2016;1(1):4-6.

Cite this article as: Pandey R, Yadav PK, Patel AK, Rani P. Outcome of primary endoscopic dacrocystorhinostomy with and without stent: a randomised prospective study. Int J Otorhinolaryngol Head Neck Surg 2018;4:137-40.