



ENDOSCOPIC DACRYOCYSTORHINOSTOMY WITH AN INNOVATIVE FLAP TECHNIQUE - OUR EXPERIENCE.

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ABSTRACT

Introduction : Dacryocystitis is characterized as an inflammatory state of nasolacrimal sac. It is typically caused by an obstruction within the nasolacrimal duct and subsequent stagnation of tears in lacrimal sac. Endoscopic dacryocystorhinostomy (DCR) is a surgical method that allows the direct drainage of tears from lacrimal sac into nasal cavity, bypassing the blocked nasolacrimal duct. This study has been done to show the result of our superiorly based flap technique and complication rate during and after the surgery. Also to show the difficulty faced during the surgery.

Aim and objectives :

1. To introduce a new technique of Endoscopic DCR
2. To find out the success rate of our technique
3. To find out the complication rate of our technique

Materials and methods : It is a Retrospective study conducted over a period of 5 years from January 2015 to December 2019. Study was conducted in the department of ENT, in a tertiary care hospital of South India. Total 40 patients were selected from the medical record department for study, who have undergone the superior based flap technique of endoscopic DCR. Data collected and analyzed by Chi square test. **Result :** Success rate of our technique is 100% for primary cases, 66.67% for revision cases with overall success rate of 95%. Overall complication rate is 20% and major complication rate is only 5%. **Conclusion :** Our technique of endoscopic endonasal dacryocystorhinostomy is a very good technique as per our study, with good success rate and fewer complications in comparison to other studies.

KEYWORDS : Dacryocystorhinostomy, Superiorly based flap, Dacryocystitis, Nasolacrimal duct

INTRODUCTION

Epiphora or watering of eye is a common complaint. It can be secondary to excessive production of tears that arise from proximal obstruction in drainage system at the punctum or canaliculus system obstruction of NLD (Nasolacrimal duct) system and may also present with mucocele, pyocele, or recurrent acute dacryocystitis¹.

Endoscopic dacryocystorhinostomy (ENDODCR) is a surgical method that allows the direct drainage of tears from lacrimal sac into nasal cavity, bypassing the blocked NLD, so a fistulous track is created between lacrimal sac and nasal cavity to alleviate epiphora caused by NLD obstruction². The first intranasal DCR was described by Caldwell in 1893². In 1989, McDonogh & Meiring described the Endoscopic transnasal DCR².

The key to successful DCR relies on atraumatic creation of large osteotomy with adequate superior bony clearance, complete marsupialization of lacrimal sac, maximal preservation of nasal and lacrimal sac mucosa with close approximation of the mucosal edges as well as regular endoscopic monitoring of ostia healing during early postoperative period. There are multiple surgical variations in performing DCR including use of endoscope vs direct visualization, preservation of mucosal flaps vs excision, powered instruments vs cold steel, suturing/gluing of mucosal flaps, use of mitomycin-c, triamcinolone, absorbable vs nonabsorbable packings. These variations are based on surgeons' preferences rather than strong evidence in favour of one over the other³.

Endoscopic dacryocystorhinostomy is most common surgery performed for chronic dacryocystitis. Posterior based flap approach while performing endoscopic DCR is most commonly used approach. In the present study, we have used our newer technique of using superiorly based flap in performing endoscopic DCR.

This study has been done to show the result of our superiorly based flap technique and complication rate during and after the surgery. Also to show the difficulty faced during the surgery. Comparison shows that our technique is unique and better when compared to other approaches with respect to success rate and incidence of complications. Intra-operative difficulty while approaching lacrimal sac is less and it provides better bloodless field during surgery.

AIMS & OBJECTIVES

- 1) To introduce a new technique of Endoscopic DCR
- 2) To find out the success rate of our technique
- 3) To find out the complication rate of our technique

MATERIALS AND METHODS

STUDY DESIGN

It is a Retrospective study conducted over a period of 2 years from January 2020 to December 2021

STUDY SETTING

The present study has been conducted in department of ENT, in two tertiary care hospital of South India.

SAMPLING CRITERIA

Samples were collected randomly

SUBJECTS (Sample size)

A Total of 40 Patients were selected for the study from department of ENT

METHODS

This is a Retrospective study Conducted in the Department of ENT. All the patients with Chronic dacryocystitis, who were operated with our technique of endoscopic DCR were selected for the study. All the data from medical record department were analyzed for statistical significance.

Record showed that almost all patients were examined by both ophthalmologists and otorhinolaryngologists by confirming that there is symptomatic distal obstruction of nasolacrimal duct that is not relieved by simple probing and syringing.

A total of 40 patients were selected for the study. Our standard procedure was endoscopic endonasal approach with our new technique of superior based flap for performing endoscopic DCR. All the patients were operated under general anesthesia.

Under general anesthesia, 2% lignocaine with 1:200,000 adrenaline was infiltrated in the submucosal plane at the site of incision i.e. at the axilla and anterior to frontonasal process up to upper border of inferior

turbinate. C' shaped incision was given for right nasal cavity (inverted C' shaped for left nasal cavity), starting from 1 cm antero-superior to the axilla, extending downward gently with convexity anteriorly up to the upper border of inferior turbinate (incision lies about 1 cm anterior to frontonasal process), then goes parallel to upper border of inferior turbinate up to the level of vertical limb of the uncinate process. A second incision was started from the axilla, vertically downward, right above the frontonasal process to join the first incision above the inferior turbinate. Mucosal flap was elevated gently using elevator and a superiorly based flap was created elevating the mucosa from the bone anterior to frontonasal process with base above the axilla. This flap was lifted and tucked above the middle turbinate.

Then the posterior border of the frontonasal process was identified. By using the punch forcep, it was removed. Thin lacrymal bone was removed by using ball probe. In case of thick frontonasal process, especially near upper part, a diamond burr drill was used to make the bone thin. So as much as bone was removed to make a bigger bone window and maximal exposure of the lacrymal sac i.e. at least 180 degree of the sac diameter should be visible using a zero degree endoscope. Lacrymal sac was confirmed by pressing the medial canthus of the eye.

After exposure of the lacrymal sac, the periosteal layer of the sac was incised with a vertical incision using a no 11 blade and the layer was removed completely from the medial wall of the lacrymal sac. Then the sac wall was incised in same manner using same no 11 blade. At this time we can see the purulent discharge coming out from the sac. Sac was cut open superiorly and inferiorly by endoscopic scissor and two flaps (anterior and posterior) were created. Syringing was done through both upper and lower punctum till clear fluid comes out freely to the nasal cavity. Then the superior based flap was repositioned anteriorly and posteriorly elevated mucosa was also repositioned. So now the sac is freely communicating with nasal cavity. No nasal pack was given. Post operatively antibiotic c, analgesic and tranexamic acid was given to all the patients.

All the patients were followed up regularly in every 15 days and evaluation was done after 3 months of surgery (Fig -1).



(Fig - 1: Postoperative view of Endoscopic DCR)

Principle of our technique is

- 1) To make a bigger bone window, that prevents post operative closure.
- 2) To remove the periosteal layer completely from the medial wall of the sac, preventing elastic action of periosteum to close the sac.
- 3) Flaps were designed in such a manner that after surgery no bony area was found bare, which prevents the formation of granulation tissue.

INCLUSION CRITERIA

- 1) Patients with symptomatic obstruction of NLD that is not relieved by probing and syringing.
- 2) Patient record with clear data is available in MRD
- 3) Patient came for regular follow up

EXCLUSION CRITERIA

- 1) Proper patient records not available
- 2) Patient having functional obstruction of Nasolacrimal duct

OBSERVATION AND RESULTS

A Total of 40 patients were selected for study. All patients have undergone ENDODCR by our technique of superior based flap approach. Out of 40 cases 34 were primary cases and 6 were revision surgery.

Table 1 shows the age and sex distribution of all 40 patients. It shows that more number of patients are female in our study i.e. 28 out of 40 (70%). Maximum number of patients are in the age group of 40 to 59 years i.e. 26 (8 males and 18 females), 65% of total patients. Youngest

patient operated in our series is a 12 year male patient and oldest patient is a 70 year female. Least common age group in our series is less than 20 years i.e. one male patient (2.5%).

Table 1: Age and sex distribution of patients

Age(years)	Male	Female	Total	Percentage (%)
< 20	1	0	1	2.5
20 - 39	2	5	7	17.5
40 - 59	8	18	26	65
60 and above	1	5	6	15
Total	12	28	40	100

Table 2 shows different clinical feature, with which patients came to our hospital and also the duration of the disease. In our study more number of patients came to us with symptoms more than 6 months i.e. 31 members out of 40. More number of patients were having epiphora only i.e. 27. 11 number of patients were having epiphora with swelling in the medial canthus. We have received one patient each having mucocele and fistula at the medial canthus.

Table 2: Symptomatology and duration

Duration of symptom	Total number of patients	Only epiphora	Epiphora with medial canthus swelling	Epiphora with a fistula	Epiphora with mucocele
less than 6 months	9	7	1	1	0
More than 6 months	31	20	10	0	1
Total	40	27	11	1	1

Table 3 shows the success rate of our study. Over all success rate is 95% (38 out of 40 patients). Very good success rate we got in primary cases i.e. 100% (34 out of 34 cases). But in recurrent cases our result is little poor i.e. 66.67% (4 successful cases out of 6). p - value is 0.015 by Chi square test, which is significant.

Table 3: Success of our technique (p = 0.015)

DCR	Total	Successful	Percentage
Primary	34	34	100
Revision	6	4	66.67
Total	40	38	95

Table 4 shows the complications during and after the surgery. Total complication rate in our study is 20 %. Most of the complications are less severe and managed effectively. Two patients were having mild granulation tissue formation which was treated by chemical cauterization. only two patients were having severe complications and failure of the surgery in the form of closure of the stomal opening (5%). This was because of severe granulation, polyp and fibrosis inside the sac. Revision was needed for these two cases.

Table 4: Intra and post operative complications

Complications	Number	Percentage (%)
Intra operative bleeding	2	5
Intra operative tissue damage	1	2.5
Post operative bleeding	1	2.5
Granulation tissue formation	2	5
Closure of the stoma	2	5
Total complications	8	20
No complications	32	80
Total Patients	40	100

DISCUSSION

Dacryocystitis accounts for 87.1% of epiphora⁴ and causes social discomfort due to continuous watering from eyes⁵.

In our study out of 40 patients, there is female predominance i.e. 28 are female (70%) and 12 are male (30%). This is correlating with a study done by Bharangar S et al (2012). In their study out of 578 patients, 558 were females (96.53%) and only 20 were males (3.46%)⁷. In a study by

Majumder A et al, there is male predominance in a series of 120 patients i.e. 75% were male and 25% were female⁶. Youngest patient in our series is 12 years and oldest patient is 70 years. This correlate with the study by Majumder et al where the youngest patient is a 15 year old girl and the oldest patient is a 67 year women.

In our study maximum number of patients are in the age group of 40 to 59 years i.e. 65% and minimum number of patients are in the age group of less than 20 years i.e. 2.5%. In the study by Majumder A et al, the maximum number of patients were in there group of 31 to 40 years i.e. 37.5% and minimum number of patients are in the age group of 61 to 70 years i.e. 7.5%⁶. In the study by Bharangar S et al, majority of the patients were in the age group of 45 to 60 year age group and minimum number of patients were in the age group of 75 to 90 years of age⁷.

In our study, the patients were presented with following symptoms i.e. 27 with only epiphora, 11 with epiphora and medial cantonal swelling and one each having fistula and mucocele. This data is correlating with the study by Majumder A et al. Majority of the patients were having only symptom of epiphora i.e. 95, next category is epiphora and medial canthus swelling i.e. 17 and 3 patients presented with lacrimal fistula and one with mucocele⁶.

In the study by Majumder et al, the over all success rate is 93.3%. In primary cases 95.23% and in revision cases 80%⁶. In the study of Bharangar et al success rate is 95 to 96 percent (4-5 % failure⁷). A study study by Agarwal S (2009), the success rate of endoscopic dacryocystorhinostomy is 100% (all the cases were symptom free)⁸. A study by Saratziotis A et al (2009), in 46 patients undergoing endoscopic DCR, the success rate is 97.8%¹⁰. Sonkhya N et al (2009), in a series of 226 patients, success rate was found to be 92%¹¹. Success rate in our study is 95% i.e. 38 out of 40 patients. In the primary cases our success rate is also 100% (34 out of 34 are symptom free).

In our study the total complication including minor and major is 20%, out of which the major complication like closure of the stoma is found in only 5% cases. We did not have any orbital complications. In a study by Pradhan P et al (2017)⁴, total complication rate is 57.14% i.e. 16 out of 28 patients. In their study they have shown that with powered instruments the complication rate is more i.e. 11 out of 14 patients (78.5%) in comparison to the conventional instruments i.e. 5 out of 14 (35.7%). But in their series the major complications like stomal stenosis and orbital fat prolapse is 4 out of 28 patients i.e. 14.2%.

CONCLUSION

Superiorly based flap in endoscopic endonasal dacryocystorhinostomy is a very good technique as per our study, with good success rate and fewer complications in comparison to other studies. As the sample size is less, more study is to be done to come in to a conclusion.

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CONFLICTS OF INTEREST

There are no conflicts of interest

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