



A COMPARATIVE STUDY ON INFERIOR BASED FLAP AND POSTERIOR BASED FLAP AND ITS OUTCOME IN ENDOSCOPIC DACRYOCYSTORHINOSTOMY IN PATIENTS WITH DACRYOCYSTITIS ATTENDING TO ENT DEPARTMENT AT TERTIARY CARE HOSPITAL

Otorhinolaryngology

V Ch V Siva Kumar	Assistant Professor (Designated Associate Professor), Department of ENT, Rangaraya Medical College, Kakinada, Andhra Pradesh, India, 533001
Ujjwala M	Junior Resident, Department of ENT, Rangaraya Medical College, Kakinada, Andhra Pradesh, India, 533001.
Tadi Jyothsna Priya Bhavani	Junior Resident, Department of ENT, Rangaraya Medical College, Kakinada, Andhra Pradesh, India, 533001.
Vadlamannati Bhavyasri	Junior Resident, Department of ENT, Rangaraya Medical College, Kakinada, Andhra Pradesh, India, 533001.
Arjun Balakrishnan	Junior Resident, Department of ENT, Rangaraya Medical College, Kakinada, Andhra Pradesh, India, 533001.

ABSTRACT

Occlusion of the nasolacrimal duct (NLD) is a frequent condition that is characterized by tearing known as Epiphora. The surgical procedure of diversion of lacrimal flow within a nasal cavity through an artificial fistula made at the level of a lacrimal sac is called Dacryocystorhinostomy (DCR). This includes complete blockages anywhere from the lacrimal punctum to the nasal cavity. The majority of nasolacrimal system obstruction is unknown. Endoscopic DCR can be done by the creation of a different types of mucosal flaps like posteriorly based mucosal flap or inferiorly based mucosal flap. In this study, we compare in detail the Chronic Dacryocystitis disease pattern and difference in surgical outcomes of endoscopic surgical outcomes of endoscopic surgical management with its 3 months follow up.

KEYWORDS

Epiphora, Dacryocystitis, Dacryocystorhinostomy(DCR), FESS, posterior based mucosal flap, anterior based flap

INTRODUCTION

Occlusion of the nasolacrimal duct (NLD) is a frequent condition that is characterized by tearing¹ known as Epiphora. It embarrasses the patient both socially and functionally, and may even endanger the eye. Epiphora from nasolacrimal system obstruction is either anatomical (70%) or functional (30%)². This includes complete blockages anywhere from the lacrimal punctum to the nasal cavity. The majority of nasolacrimal system obstruction is unknown. Idiopathic obstruction is seen more frequently with increasing age and demonstrates a female preponderance with ages above 40 years and peak in 60-70 years. Less common causes include surgical trauma, facial trauma, granulomatous conditions such as Wegener's granulomatosis & 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 rare². It is more common in India, among people of lower socioeconomic status³.

The surgical procedure of diversion of lacrimal flow within a nasal cavity through an artificial fistula made at the level of a lacrimal sac is called Dacryocystorhinostomy (DCR). It is performed to relieve epiphora resulting from distal obstruction of the NLD that is not relieved by probing and syringing. It is not for obstruction at the canaliculi or punctum as the endoscopic DCR will not bypass these areas. Earlier, external DCR was the treatment of choice, largely due to the simplicity of technique. After the advent of endoscopes and technical advances in the Rhinology instrumentations the endoscopic approach is currently the technique of choice, as it allows improved visualization, avoids an external incision, and does not pose a risk of injury to the medial palpebral ligament or orbicularis oculi thus preserving the pumping mechanism of the lacrimal apparatus.⁴

Endoscopic DCR can be done by the creation of a different types of mucosal flaps like posteriorly based mucosal flap or inferiorly based mucosal flap.

In this study, we compare in detail the Chronic Dacryocystitis disease pattern and difference in surgical outcomes of endoscopic surgical management with its 3 months follow up.

AIMS AND OBJECTIVES OF THE STUDY

1. To Study age and gender differences in primary nasolacrimal blockage.

2. To study presenting clinical features of chronic dacryocystitis
3. To compare the surgical outcome of two different types of flaps (inferior and posterior based flap) in endonasal endoscopic DCR
4. To compare incidence of complications and causes of failure in inferior based and posterior based flap in endonasal endoscopic DCR

METHODS

The current study was conducted on all patients attending the ophthalmology and ENT OPDs at Government General Hospital, Rangaraya Medical College, Kakinada, over a period of 13 months, from June 2021 to July 2022. There were 30 patients with chronic dacryocystitis in this research, 15 of whom had endonasal endoscopic DCR with posterior-based mucosal flap method and 15 of whom had endonasal endoscopic DCR with inferior-based mucosal flap technique. A basic random approach was used to choose all of the patients.

All patients attending OPD with recurrent epiphora and diagnosed as NLD obstruction based on symptomatic, clinical, and radiological backgrounds were included while patients with punctal block, blockage of the canalicular and common canalicular systems were excluded. Patients with lacrimal sac tumours, lower lid pathology, external compression of NLD or associated with bony deformity were also excluded.

A thorough history of patients' complaints- onset and duration, past history, previous treatment history was taken. General physical examination, complete ophthalmic examination which include ROPLAS TEST (Regurgitation on pressure over the Lacrimal Sac), probing, syringing, slit-lamp examination, Schirmer's test and complete nasal examination at ENT department which include anterior rhinoscopy, posterior rhinoscopy, diagnostic nasal endoscopy, Xray PNS, CT PNS, routine blood investigations. A detailed description of all the procedures were educated to the patients before executing.

Surgical Procedure:

Almost all the patients had underwent local anesthesia. Very few patients were under general anesthesia. The nasal cavities are packed with 4% xylocaine 30 ml and 1:1000 adrenaline 0.5 cc along with premedication of 1cc Fortwin, 2cc Phenergan given intramuscularly. Under local anaesthesia described above, the patient will be in a supine position with the head-end elevated to 15°. Nose packing is done with 4% xylocaine with 1:1000 adrenaline. Local infiltration was given

with 1% xylocaine with 1:200000 adrenaline. 0° and 45° 4mm Hopkins's rod endoscopes are used.

Raising mucosal flap using 15 size blade.

a. Posterior-based mucosal flap: A horizontal incision was given 8-10mm above the axilla of middle turbinate, extending 1cm anteriorly over the frontal process of the maxilla. From the uncinete process to the frontal process of the maxilla, another horizontal incision was made at the midpoint of the middle turbinate's vertical distance. Both the incisions are joined anteriorly by a vertical incision. This flap was then elevated posteriorly to expose lacrimal bone, uncinete process, and the ager nasi cell.

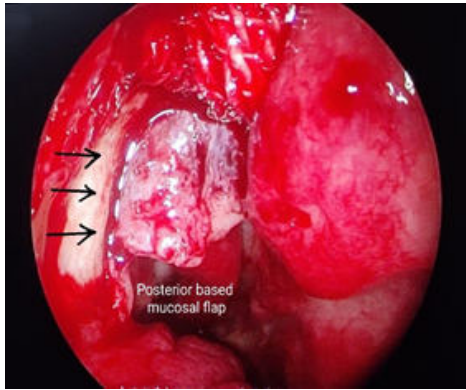


Figure 1– Posterior Based Mucosal Flap Endoscopic Picture

b. Inferior-based flap:

The initial horizontal incision was taken 8mm above and 3mm behind the axilla of the middle turbinate. At the frontal process of the maxilla, the incision is directed vertically downwards and ends just before the upper half of the inferior turbinate. Another vertical incision should be given from the posterior end of the initial horizontal incision. Hence inferior-based flap is elevated and rolled down over inferior turbinate.

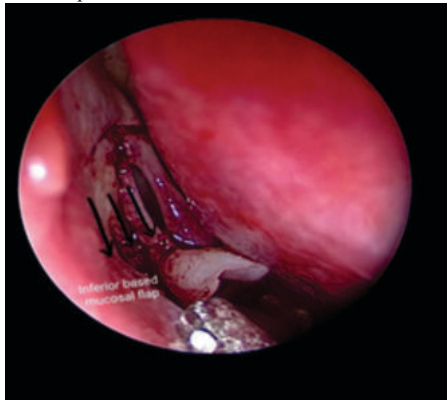


Figure 2– Inferior Based Mucosal Flap Technique

The bone over the frontal process of maxilla nibbled over the full length of the lacrimal sac using Kerrison's punch. From the fundus to the beginning of NLD, the lacrimal bone was removed and the lacrimal sac was revealed.

Applying pressure externally over the nasolacrimal sac region confirms the medial wall of the lacrimal sac. A sickle knife is used to open the lacrimal sac from above downwards, and additional incisions are done to generate anterior and posterior based flaps.

Syringing done to see the drainage. After confirming that nasal mucosa flap trimmed and lacrimal mucosa flap is also trimmed and both were approximated to make a continuous lining. Nasal packing is done with paraffine soaked gauze

Post Operative Care:

Pack removed on 2nd postoperative day and patients were kept on broad spectrum systemic antibiotics for 1 week and antibiotic eye drops for 3 weeks and steroid nasal spray for 3 weeks in postoperative advised saline nasal drops postoperative period. They were asked to visit and cleaning done after one week, 15 days, monthly for 3 months

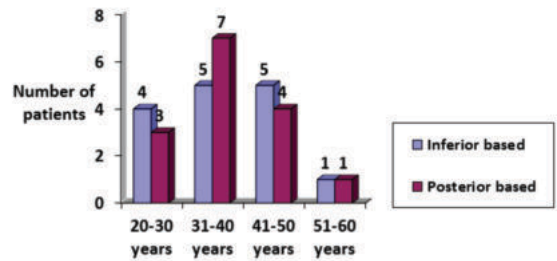
All patients were monitored for problems and recurrences for one month, two months, and three months.

OBSERVATIONS AND RESULTS

There were total 30 patients over a period of 13 months. The age distribution is 7 patients (23.3%) are in the age group 20-30 years, 12 patients (40%) are in 31 to 40 years, 9 patients (30%) are in 41 to 50 years and 2 patients (6.66%) are in 51 to 60 years.

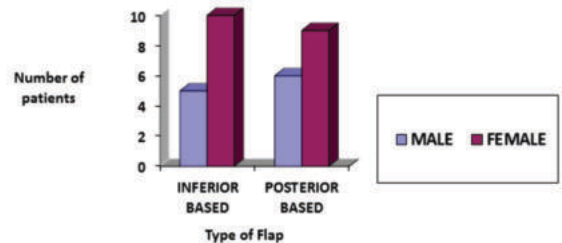
Out of 15 patients who underwent inferior based flap- 4 patients (26.66 percent) are in the 20-30 year age group, 5 patients (33.33 percent) are in the 31-40 year age group, 5 patients (33.33 percent) are in the 41-50 year age group, and 1 patient (6.66 percent) is in the 51-60 year age group.

Three patients (20%) are between the ages of 20 and 30, seven patients (46.66 percent) are between the ages of 31 and 40, four patients (26.66 percent) are between the ages of 41 and 50, and one patient (6.66 percent) is between the ages of 51 and 60 for posterior based flap.



GRAPH 1-AGE DISTRIBUTION IN BOTH GROUPS

The gender distribution showed 11 males (36.67%) and 19 females (63.34%). Of 15 patients who underwent inferior-based flap, 5 patients (33.37%) were male and 10 patients (66.67%) were female. Of 15 patients who underwent posterior-based flap, 6 patients (40%) were male and 9 patients (60%) were female.



Graph 2 - Gender Distribution Of Patients In Both Groups

Out of the 30 patients, 16 patients (53.33%) presented with only watery discharge, 9 (30%) with watery discharge and swelling while 5 (16.67%) with mucopurulent discharge. 14 patients (46.66%) were having right sided disease while 16 patients (53.33%) were having left side disease.

Table 1- Surgical Outcome Based On Type Of Flap Used In Surgery

		INFERIOR BASED FLAP	POSTERIOR BASED FLAP
SURGICAL OUTCOME	SUCCESS	13	12
	FAILURE	2	3
	SUCCESS PERCENTAGE BASED ON TYPE OF FLAP USED IN SURGERY	86.66	80
	FAILURE PERCENTAGE BASED ON TYPE OF FLAP USED IN SURGERY	13.33	20

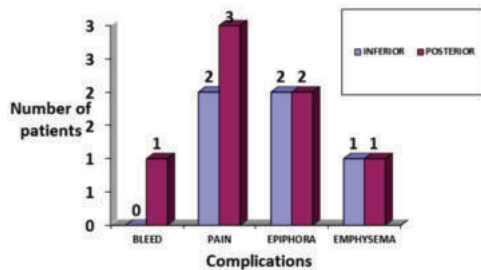
The value of Chi Square is 0.24. 0.624206 is the p value. Because p > 0.05, the result is not significant.

Table 2 – Complications Of Surgery In Both Groups

		INFERIOR BASED FLAP	POSTERIOR BASED FLAP
COMPLICATIONS (IN EYES)	PRESENT	4	5
	ABSENT	11	10
	PERCENTAGE OF PATIENTS WHO HAD COMPLICATIONS IN SURGERY	26.66	33.33
	PERCENTAGE OF PATIENTS WHO DID NOT HAVE COMPLICATIONS	73.33	66.66

The chi square statistic for this study is 1.2. The significance level is 0.27. At $p > 0.05$, the result is not significant.

The post operative complications include bleeding, nasal pain, epiphora and subcutaneous emphysema.



Graph 3 – Presence Of Postoperative Complications In Patients Of Both Groups

Table 3 – Causes Of Failure

CAUSES OF FAILURE	NUMBER IN INFERIOR BASED FLAP	NUMBER IN POSTERIOR BASED FLAP	PERCENTAGE IN INFERIOR BASED SURGERY	PERCENTAGE IN POSTERIOR BASED SURGERY
SYNECHIAE	1	2	6.66	6.66
GRANULOMA	1	1	0	6.66
TOTAL	2	3	13.34	20

The chi square statistic is 0.1389, p value is 0.709388 which is not significant as $p > 0.05$

The above table shows that out of 15 patients who underwent inferior based flap surgery one patient (6.66%) had synechia, one patient (6.66%) had granuloma. Out of 15 patients who underwent posterior based flap surgery 2(13.34%) patients had synechia, 1(6.66) had granuloma.

The post operative syringing results in first 3 months are following-

Table 4 – Syringing Results In The First Month

SYRINGING	NUMBER IN INFERIOR BASED FLAP	NUMBER IN POSTERIOR BASED FLAP	PERCENTAGE IN INFERIOR BASED SURGERY	PERCENTAGE IN POSTERIOR BASED SURGERY
PATENT	14	13	93.33	86.66
REG OF FLUID	1	2	6.66	13.33
TOTAL	15	15	100	100

Table 5 – Syringing Results In The Second Month

SYRINGING	NUMBER IN INFERIOR BASED FLAP	NUMBER IN POSTERIOR BASED FLAP	PERCENTAGE IN INFERIOR BASED SURGERY	PERCENTAGE IN POSTERIOR BASED SURGERY
PATENT	14	12	93.33	80

REG OF FLUID	1	3	6.66	20
TOTAL	15	15	100	100

Table 6 - Syringing Results In The Third Month

SYRINGING	NUMBER IN INFERIOR BASED FLAP	NUMBER IN POSTERIOR BASED FLAP	PERCENTAGE IN INFERIOR BASED SURGERY	PERCENTAGE IN POSTERIOR BASED SURGERY
PATENT	13	12	87.66	80
REG OF FLUID	2	3	13.33	20
TOTAL	15	15	100	100

According to the above table, two patients (13.33 percent) in the inferior based flap group and three patients (20 percent) in the posterior based flap group have fluid regurgitation.

DISCUSSION

In our study among 30 patients 19 were females (63.34%) and 11 were males (36.67%) while in **Anila Monika et al., (2016)⁴** research on NLD obstruction in adults on 137 patients of which 16% were male and 84% female showing similar female preponderance. We had 46.66% patients had right sided disease while 53.33% patients had disease in left side which is correlating with other studies such as **Khatoun J et al., (2021)⁵** research on 212 patients of those left side (107; 50.47%) as more commonly involved than the right (78; 36.79%) .

The most common complaint was found to be epiphora. 53.33% patients had epiphora, 30 % of patients had presented with epiphora and swelling. In total in our study 83.33% patients presented with epiphora. While 16.6% of patients presented with mucopurulent discharge similar to **A Majumder et al., (2012)⁷** study on 120 patients of which majority of patients (93%) presented with epiphora.

In our study out of 30 patients total 15(50%) patients were presented with complications including both intraoperative and postoperative. No Serious complications like CSF Rhinorrhoea and orbital injury were encountered. Out of 15 patients 3(20%) patients got intraoperative bleeding , one patient from IBF group and 2 patients from PBF group which was controlled by nasal packing with adrenaline soaked packs. 12(80%) patients who got immediate postoperative complications 5 patients belongs to inferior based flap group and patients belong to posterior based flap group. All post operative complications are managed appropriately with Antibiotics, Anti-inflammatory drugs, eye massage and local ice pack application. **Pradeep Pradhan et al., (2017)⁵** done a study on double posterior based flap method in 28 patients in which 2 patients had anterior nasal bleeding in immediate post op period. Patients in our study are monitored for three months. Syringing was done during the first four postoperative days, as well as at the end of one week, one month, two months, and three months. At the end of third month, patients were assessed objectively by irrigation of lacrimal system and assessment of flow through stoma with 0° endoscope. In our study at the end of third month failure of syringing was observed in 2 patients in Inferior based flap group and 3 patients in Posterior based flap group. As per **Mann BS and Wormald PJ et al., (2006)⁸** The DCR ostium decreases slightly but significantly in the first four weeks following surgery before stabilising. So, minimum time for followup is 1 month **Tsirbas and Wormald⁹** stated key to successful Endoscopic DCR is to expose the lacrimal sac as wide as feasible and marsupialize into the lateral nasal wall in an opposite direction to facilitate healing rather than granulation tissue production.

In our study out of 30 patients total 5(16.67%) patients were presented with recurrence. Surgery failure was defined as persistent epiphora and failure of irrigation post operatively at 3 months. The overall primary success rate of inferior based flap technique is 93.34% and posterior based flap technique is 90% at 3 months after surgery but difference is statistically not significant as p value is 0.709 (> 0.05) postoperative nasal endoscopy was done in all cases

1.Pradeep Pradhan et al., (2017)⁵ did a study on double posterior-based flap technique in 28 patients in which 6 patients (21.42%) were presented with synechia 3(12%) patients were presented with recurrence of symptoms of which 1(8.33%) patient was from group A and 2(15.38%) were from group B and failures were because of granulation tissue and stomal stenosis.

CONCLUSION

Watering of eyes or epiphora is an extremely bothersome problem. Overflow of tears may cause irritation of face and eyelid. It often makes driving difficult due to distortion of images which is even dangerous. Most widely accepted modality of treatment for NLD obstruction now a days is Endonasal Endoscopic Dacryocystorhinostomy.³

The following could be concluded from comparative study done on 30 patients, 15 of which underwent Posterior based flap technique and 15 underwent Inferior based flap technique.

1. Most of the patients belong to age group of 31-40 years (40%)
2. Females constituted 63.34% while males constituted 36.67%. Male: Female ratio is approximately 1:2
3. 53.34% eyes presented with nasolacrimal obstruction on left side
4. Almost 80% patients presented with epiphora as primary symptoms of those 30% had both epiphora and swelling near medial canthus of eye
5. Endonasal Endoscopic DCR using Inferior based flap technique has higher primary success rate (86.67%) when compared to Posterior based flap (80%) technique but difference is statistically insignificant (p value is 0.624206 which is >0.05)
6. Endonasal Endoscopic DCR using Inferior based flap technique has minimal complications (6 patients) when compared to Posterior based flap technique (9 patients) but the difference is not significant statistically (p value 0.27 which is >0.05)
7. Endoscopic DCR using posterior based flap technique is standard procedure for treatment of lacrimal sac obstruction for successful outcome with minimal complications till now but Inferior based flap technique is also as good as posterior based flap technique, So both procedures can be used in relief of tearing and infection.

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