



COMPARATIVE STUDY OF EXTERNAL DACRYOCYSTORHINOSTOMY WITH ENDOSCOPIC ENDONASAL DACRYOCYSTORHINOSTOMY

Ophthalmology

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ABSTRACT

The most common cause of chronic dacryocystitis is obstruction of nasolacrimal duct which occurs due to inflammation of the lacrimal sac and nasolacrimal duct causing epiphora. An attempt had been made to study the outcome and compare the success rate of external dacryocystorhinostomy versus endoscopic endonasal dacryocystorhinostomy. A total of 46 consecutive patients were selected for DCR surgery Department of Ophthalmology, Shri B M Patil Medical College, Vijayapura. Among those 23 patients underwent external DCR and 23 patients underwent endoscopic endonasal DCR. Data regarding ocular examination, lacrimal drainage system, per-operative and postoperative complications and ultimate surgical outcome were collected and analyzed. It was observed that the major intra operative complication in both the groups was haemorrhage, which hampered visualization during surgery. The other minor complications like accidental trauma to uncinata was seen in Endonasal DCR. Post operatively almost all the patients in Endonasal DCR underwent nasal endoscopic examination for intranasal cleaning of mucus, debris. Success rate for External DCR was 100% and for Endonasal DCR, it was 91.3%. The failed cases showed synechiae formation between the lacrimal sac flap and nasal mucosal flap in Endonasal DCR. The failed cases were advised to undergo external DCR again. In these results, we concluded that External DCR had higher success rate than the endonasal DCR. An endonasal procedure has the advantage of dealing with associated deviated nasal septum, avoidance of cutaneous scar. Disadvantages and limitations include the cost and the need of the training in the usage of those instruments.

KEYWORDS

Dacryocystorhinostomy, External, Endonasal, Chronic Dacryocystitis

INTRODUCTION:

Epiphora is an imperfect drainage of tears through the lacrimal passages. Chronic dacryocystitis is mainly caused by the obstruction of nasolacrimal duct occurs which manifests as the inflammation of the lacrimal sac and nasolacrimal duct causing epiphora.¹

Dacryocystitis generally affects two age groups, infants and adult over 40 years of age. Congenital dacryocystitis is almost always chronic, while acquired dacryocystitis may be acute or chronic. Chronic dacryocystitis is more common among adults. Dacryocystitis affects both sexes but more commonly found among women over 40 years of age². It is found more common in people from lower socioeconomic status.

Cardinal symptoms of chronic dacryocystitis are watering and discharge from the eye. Otherwise, this leads to complications like acute dacryocystitis, corneal ulcer and chronic conjunctivitis. Acute dacryocystitis further can cause complications like lacrimal abscess, lacrimal fistula, orbital cellulitis, osteomyelitis and cavernous sinus thrombosis which can be life threatening. Its treatment aims at creating a new passage for drainage of tears from conjunctival sac into the nasal cavity, bypassing the blocked nasolacrimal duct.¹

The external dacryocystorhinostomy (DCR) is the gold standard procedure for treatment of chronic dacryocystitis till today by which all other newer methods of DCR procedures are assessed³. As the technique has developed, so the success rate for the external procedure improved until today in the hands of properly trained oculoplastic surgeons success rate of between 90 to 95% can be expected. With the recent beginning of endoscopes and microscopes in the surgery, the original procedure of external DCR with extensive dissection have been questioned by some surgeons which has led to interest in less invasive procedures like endonasal endoscopic DCR. The major advantages being escaping of cutaneous wound, and limited tissue dissection and co-existing nasal pathology can be dealt at the same time in the same operation. However, major problems like complete visualization, removing of lacrimal bone and control of excessive bleeding were unsolved with endonasal endoscopic DCR.

The prospects of lacrimal surgery are undoubtedly changing and though external DCR still remains the gold standard by which other methods is measured, endonasal DCR has been gaining popularity as the preferred procedure over the last few years.

There are very few studies comparing the outcome of the two

techniques. Therefore in the context of above discussion, this comparative study of external DCR surgery and endonasal DCR surgery was undertaken for research.

MATERIALS AND METHODS:

The present study was conducted in Department of Ophthalmology, Shri B M Patil Medical College, Vijayapura, during Oct 2016 to April 2018. A total of 46 consecutive patients were selected for DCR surgery Department of Ophthalmology, Shri B M Patil Medical College, Vijayapura. Among those 23 patients underwent external DCR and 23 patients underwent endonasal DCR. For the symptom of epiphora and diagnosed as primary acquired nasolacrimal duct obstruction or chronic dacryocystitis.

Inclusion criteria was as follows:

1. All the cases of acquired chronic dacryocystitis with established nasolacrimal duct obstruction.
2. Both male and female patients, 20-60 years of age are included in the study.

While following patients were excluded from study:

1. Epiphora with no signs of lacrimal drainage obstruction on sac syringing
2. Ectropion/ entropion/ lower lid laxity
3. Canalicular and punctual obstruction
4. Post traumatic bone deformity of lacrimal region
5. History of sino nasal malignancy and granulomatous conditions
6. Atrophic rhinitis and acute sinusitis
7. Previously failed DCR

A detailed ocular examination and anterior rhinological examination was done. Anterior rhinoscopy was done by otorhinolaryngologist and looked for any significant deviation of nasal septum, polyposis and hypertrophy of turbinates. If they were having any co-existing disease, they were all dealt at the same sitting. The patency of nasolacrimal duct was checked by lacrimal syringing. Mucoïd/ mucopurulent regurgitation, presence or absence of mucous flakes and the punctum from which regurgitation occurred was noted.

Routine blood investigations like complete blood count, bleeding time, clotting time were done along with HIV, HBsAg and blood sugar levels. Pre-op topical moxifloxacin and nasal decongestant drops were given to patients for three days.

STATISTICAL ANALYSIS:

All characteristics were summarized descriptively. Chi-square (χ^2) test

was used for association between two variables. In the cases of more than 30% cell frequency <5, Freeman-Halton Fisher exact test was employed to determine the significance of differences between groups for categorical data. If the p-value was < 0.05, then the results were considered to be statistically significant otherwise it was considered as not statistically significant. Data were analyzed using SPSS software v.23.0. and Microsoft office 2007.

RESULTS:

In the present study, total 46 cases comprising 23 cases underwent external DCR and 23 cases in endonasal DCR (Table 1), among them postop complications were significantly higher in endonasal DCR group.

Table 1: Distribution of Complications Between Study Groups

Complications	External		Endonasal		p value
	N	%	N	%	
Intraop complications	7	30.4	7	30.4	-
Postop complications	4	17.4	11	47.8	0.028*

Note: * significant at 5% level of significance (p<0.05)

In both groups, the most common intra operative complication was bleeding (figure 1), in external DCR minimum bleeding was observed in 4 cases (17.4%) Moderate bleeding in 2 cases(8.7%) and severe bleeding was seen in 1 cases (4.3%). In endonasal DCR, 4 cases (17.4%) had moderate bleeding and in 1 case (4.3%) had severe bleeding. In 1 cases (4.3%) false passage was created. In 1 cases (4.3%) there were accidental trauma to uncinatae .

Major Post operative complications in external DCR was epistaxis which was noted in 2 cases (8.7%) , wound discharge in 2 cases (8.7%) on 1st post operative day while in endonasal DCR, 6 cases (26.1%) had epistaxis and 4 cases (17.4%) had lid odema on 1st post operative day. On follow up, 1 cases (4.3%) was found with synechia formation between the lacrimal sac flap and nasal mucosal flap on endoscopic examination.

Figure 1: Distribution of Intra Operative Complications between Study Groups

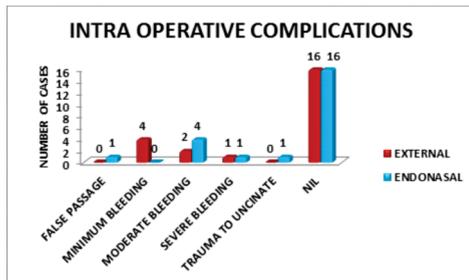


Figure 2: Distribution of Post Operative Complications Between Study Groups

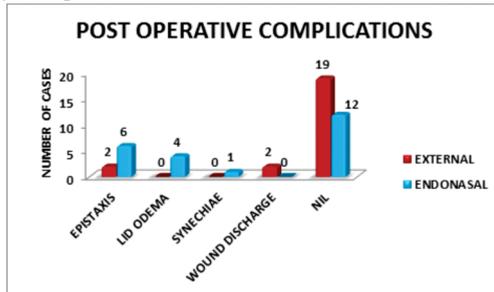


Table 2 shows the post operative evaluation by sac syringing. It was done by lacrimal sac syringing using normal saline. In most of the cases sac syringing was done on first post operative day but in patients who complained of tenderness and bleeding per nose, it was done after 3 to 4 days.

In external DCR group, it was found that in all 23 cases (100%) lacrimal passages were patent on the 1st week follow up. After 6th week and 3 months of follow up, all 23 cases were patent. While in endonasal DCR, in 21 cases (91.3%) lacrimal passages were patent and

in 2 cases (8.7%) it was blocked on the 1st week follow up. After 6th week of follow up only in 21 cases (91.3%) lacrimal passage were patent and block was present in 2 cases (8.7%). 2 cases in which lacrimal passage was blocked external DCR was done.

Table 2: Distribution of Follow-up by Sac Syringing Between Study Groups

Week	Followup by Sac Syringing	External		Endonasal		p value
		N	%	N	%	
1st week	Blocked	0	0.0	2	8.7	0.296
	Patent	23	100.0	21	91.3	
6weeks	Blocked	0	0.0	2	8.7	0.296
	Patent	23	100.0	21	91.3	
3 months	Blocked	0	0.0	0	0.0	1.000
	Patent	23	100.0	23	100.0	
Total		23	100.0	23	100.0	

The success rate was defined by the presence of patent lacrimal passage by lacrimal sac syringing at the end of complete follow up. In this study the success rate in external DCR group was 100%. In endonasal DCR group, the success rate was observed in 21 cases (91.3%) and failure was seen in 2 cases (8.7%).

DISCUSSION

In the present study intra operative complications were almost equally present in external and endonasal DCR groups. In external DCR, it was minimum in 4 cases, moderate in 2cases and was severe in 1 cases. Minimum and moderate bleeding was seen during the punching of the lacrimal bone as well as while making nasal mucosal flaps. The bleeding was stopped by packing the area with the ribbon gauze soaked in 4% lignocaine with adrenaline for some minutes. One patient had severe bleeding while making skin incision due to injury to angular vein, which may have been due to varied anatomical position. Haemostasis was achieved with clamping and ligating the vein and surgery was continued.

Though majority of operative interventions go well, most of them are complicated by haemorrhage creating difficulties. Therefore major complication of external DCR surgery was found bleeding. Hartikainen et al¹ did not observe any intra-operative bleeding as troublesome in his study. However, he observed that there was accidental entry to anterior ethmoidal air cells in 6 cases (9%) while doing osteotomy. In our study, there was no such complication seen in external DCR.

Other minor complications in this group were damage to the lacrimal sac while making flaps and damage to nasal mucosa, while trephining the lacrimal bone.

In endonasal DCR group, 4 cases with moderate bleeding and 1 case with severe bleeding were found. One patient also required resection of the anterior part of middle turbinate because it was hypertrophied and was obscuring the endoscopic view as the sac was located posteriorly. Rebeiz et al², in his study, noticed that during the endonasal procedure, the removal of the anterior end of the middle turbinate was helpful to expose the sac area, to locate the sac and to decrease the risk of scarring and fibrosis after the operation.

The other minor complications encountered was trauma to uncinatae process related to the improper handling of the endoscopic instruments and creation of false passage.

Post operative complications were significantly higher in endonasal DCR group. In external DCR, 2 cases had epistaxis on 1st post operative day and 4 cases which were resolved by nasal packing and medical treatment. Tarbet et al³ have reported a rate of 2.6% for excessive scarring post operatively and a rate of 3.9% for post operative haemorrhage which was seen in 7 cases (11.66%) in present study. Walland et al⁷ have reported 1.6% incidence of infection after open lacrimal surgeries. In external DCR, 6 cases had epistaxis on 1st post operative day and 4 cases had lid edema and tenderness which were resolved by nasal packing and medical treatment, one case showed synechia formation which were detected on nasal endoscopy post operatively. Post operatively out of 16 cases Nayak et al⁸ had 3 cases (18.75%) of synechia formation and 2 cases (12.5%) had granulation tissue in the operated area which were successfully treated

endoscopically as an office procedure. In our study the number of cases showing synechia formation post operatively was very low (10%) as compared to this study.

Hartikainen et al⁴ had primary success rate of 91% for external DCR and 75% for endonasal DCR which was 100% in external DCR was in 23 cases and 91.3% in Endonasal DCR group in this study. Cokkesser et al⁹ showed the success rate of 89.9% for external DCR and 88.2% for endonasal DCR.

CONCLUSION :

The major intra operative complication in both the groups was haemorrhage, which hampered visualization during surgery. The other minor complications like accidental trauma to uncinata was seen in Endonasal DCR. The post operative complications in both the groups were very few and occurred at a very low rate. Post operatively almost all the patients in Endonasal DCR underwent nasal endoscopic examination for intranasal cleaning of mucus, debris. Success rate for External DCR was more than Endonasal DCR

In the light of these results, it can be concluded that External DCR had higher success rate than the endonasal DCR but the difference was not significant. An endonasal procedure has the advantage of dealing with associated deviated nasal septum, avoidance of cutaneous scar. But the disadvantages and limitations include the need for costly and sophisticated equipment, the training in the usage of those instruments and steep learning curve. Both the surgical procedures have a minimal risk of intra and postoperative complications and represent good alternative for the treatment of lower lacrimal passage obstruction.

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Conflict of interest: Nil

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