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A Comparative Study of External DCR versus Endonasal DCR

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Abstract: External dacryocystorhinostomy (DCR) was the choice of surgery in cases of epiphora due to nasolacrimal duct obstruction (NLDO) over a decade. Since 1970,'s Endoscopic endonasal dacryocystorhinostomy gaining popularity due to fewer complications and ease of doing surgery. To find out the outcome of external and endoscopic DCR in patients presented with nasolacrimal duct obstruction. A descriptive follow up study was conducted in MGM Medical College and LSK Hospital, Kishanganj, Bihar compared the outcome of External DCR with Endonasal DCR. Total number 80 patients were selected in our study with NLD block with a follow up six months. Equal number of patients distribution was done in both external (40 cases) and endonasal (40 cases) approaches to make comparison easier. Outcome of external and endonasal dacryocystorhinostomy (DCR) were compared in terms of success (External 88% versus Endonasal 90%) that is, no signs of postoperative epiphora and failure (External 12% versus Endonasal10%) that is, no improvement of watering at the end of 6 months follow up period. Follow up was done for a minimum of 6 months. In terms of success rate, endonasal and conventional external dacryocystorhinostomy are comparable. Endonasal dacryocystorhinostomy is gaining popularity because of patient's satisfaction and also because of fewer complications.
Key words: DCR, Endonasal, NLDO.

INTRODUCTION

Dacryocystorhinostomy is the creation of an alternative pathway for the drainage of tears between the lacrimal sac and nasal cavity bypassing the nasolacrimal duct. There are two approaches. First one is age old method of external approach (external DCR) and another one is endonasal DCR which is gaining popularity and is through the nasal cavity. External DCR was preferred as the only solution of acquired nasolacrimal duct obstruction with reasonably high success rate despite few complications. The first modern and documented surgery for nasolacrimal duct obstruction was originally described in 1904 by Toti and later modified by Dupuy-Dutemps and Bourguet. Furthermore, endonasal DCR had been first proposed by Caldwell in 1893. Caldwell had used an electric "burr"to create a middle meatal osteotomy in the area marked by a metal probe [1].

The endonasal DCR is gaining popularity because of few advantages:

- Better aesthetic result with no scar.
- Can be done in active infection.
- It preserves the pumping mechanism of orbicularis oculi muscle.
- No injury to medial canthal ligament.
- Easier to do revision surgery.
- Operated area can be directly visualized due to less blood in operated area.
- Operative time is less.
- Success rate is almost equivalent to external approach.

Disadvantages of endonasal approach

- Equipments are expensive.
- Success depends on the experiences of the surgeon.

MATERIALS AND METHODS

A descriptive follow up study was conducted for the period of two years study from June, 2014 to May 2016 in MGM Medical College Kishanganj and LSK hospital, Bihar compared the outcome of External DCR with Endonasal DCR. Total number 80 patients were selected in our study with NLD block with a follow up to six months. The data collection tool used for the study was an interview schedule that was developed at the Institute with the assistance from the faculty members and. A predesigned, pretested, semi- structured questionnaire was used to collect the data**.** Ethical clearance was obtained from Institutional Ethical committee before the data collection. All patients with acquired nasolacrimal drainage obstruction.

Exclusion Criteria: (a) Patients with punctal and ductal obstruction (b) Lower eyelid malposition.

Most of the cases (75) were done under Local Anaesthesia and few cases (5) were done under General Anaesthesia who was not cooperative. Silicon intubation was done in all cases of both external and endonasal approaches. Silicon tube was kept for 8 weeks in each approach and follow up of minimum six months. All cases were documented in a pro forma with note down of any infection during surgery, duration of surgery, hemorrhage during surgery, post-operative complications, follow up and patients satisfaction.

STATISTICAL ANALYSIS

The collected data were thoroughly screened and entered into Excel spreadsheets and analysis was carried out. The procedures involved were transcription, preliminary data inspection, content analysis, and interpretation. SPSS 19.0 was used to calculate proportions, and significance test was used in this study.

RESULTS

Age: Out of 80 cases, we did 40 external DCR and another 40 were operated endonasal. Most of the cases in our study were in the age group of 31-40 years that is 37% followed by age group of 41-50 years that is 26%.

Table-1: Age Distribution

Age	Extertnmal DCR	Endonasal DCR	Total	Percentage
20-30	6	7	13	16
31-40	15	14	29	37
41-50	10	11	21	26
51-60	7	8	15	19
61-70	1	1	2	2

Sex: Most of our patients were female 71(89%) as compared with male 9(11%). A female preponderance was noticed in this study. Only 20% (8 patients) were males as compared to 80% (32 patients) females [2].

Table-2: Sex Distribution

Sex	Number	Percentage
Male	9	11
Female	71	89

Duration of surgery

We found that the time taken to complete external DCR is longer than that of endonasal DCR. In our study the average time of external DCR was around 65 minutes as compared to 50 minutes in endonasal approach. In one study surgical time of external DCR was 56 min against endonasal DCR of 48 min [3].

DISCUSSION

Pathophysiology of dacryocystitis. Two types of inflammation (dacryocystitis) is found in the lacrimal sac, one is acute and another is chronic inflammation. It all starts when there is a blockage of nasolacrimal duct. On account of the obstruction of the duct there is interference with the normal flow of tears through the sac. The tears, with their bacterial content are retained and inflammation follows in the sac. The contents of the sac are augmented by a mucopurulent secretion from the inflamed mucosa; then the sac becomes dilated and the walls thickened [4].

External Dacryocystorhinostomy (DCR) has been conducted over a decade for acquired nasolacrimal duct obstruction. After the advent of rigid nasal endoscope, endonasal DCR started gaining popularity. In both the approaches a connection was made in between lacrimal sac mucosa and nasal mucosa. In our study we found most of our patients were female 71(89%) as compared to male 9 (11%).

Out of 80 cases we did 40 external DCR and another 40 was operated endonasal. Most of the cases in our study were in the age group of 31 -40yrs that is 37% followed by age group of 41-50yrs that is 26%. In our study we found that most of the patients were from lower socio economic group.

Duration of actual surgery was taken into consideration. Time taken to complete external DCR is longer than that of endonasal DCR. In our study average time of external DCR was around 65 minutes compared to 50 minutes of endonasal approach. This is significant. It was always easier to perform a revision endonasal DCR than to do an external revision DCR. Revision of DCR can be performed successfully via an endoscopic approach and usually requires a scar excision at the osteotomy site and re intubation of lacrimal system using a silicon stent [5]. Intraoperative hemorrhage was more in external rather than in endonasal approach although it was never significant. Post-operative complications: In our study, we experienced approximately 12% failure rate in external DCR. Out of 40 cases of external approach we had 2 cases of epistaxis which were managed by nasal pack. Wound infection was found in 5 cases and managed subsequently. There were 5 cases of rhinostomy closure at the end of 6 months and was considered failure and were managed with endonasal DCR.

Table-3: Complications of External DCR

	Number	Percentage
Epistaxis	2	5
Wound infection	5	13
Rhinostomy closure	5	12

Complications of endonasal DCR were, 4 cases of granulation at operated site, 5 cases of epistaxis, synechiae and rhinostomy closure in 4 cases. So failure rate of endonasal DCR was 10% as compared to external DCR at 12%.

Tables-4: Complications of Endonasal DCR

	Number	Percentage
Granulation	4	10
Epistaxis	5	13
Synechiae	2	5
Rhinostomy closure	4	10

Our success rates were comparable in both approaches. We had a success rate of 88% in external DCR versus 90% in endonasal DCR. We had gone through a number of studies comparing endonasal DCR with that of traditional external DCR.

In one study overall success rates of Endonasal DCR (46 cases) and external DCR (28 cases) surgeries had statistically significant success rates (92% versus 93.67%) at a mean follow-up period of 5.9 months. This difference was not statistically significant [6]. Another retrospective study the success rate defined as absence of epiphora in the external DCR group was 90.9% and 95% in endoscopic DCR group [7].

Although many studies had documented a slightly higher success rate in endonasal DCR, but this approach was not without complications. In our studies we found high up deviated nasal septum around the area of middle turbinate caused difficulty in performing wide rhinostomy. So it might require septal correction before DCR or at the same sitting along with DCR by an ENT surgeon. We found complications like granulation at osteotomy site and synechiae are the causes of failure.

Although complications like orbital fat herniation, medial rectus paralysis, subcutaneous emphysema, CSF rhinorrhoea had been documented in literature, we didn't encounter these complications in our series.

We found that patient's compliance and satisfaction was more in endonasal approach because of absence of scar mark, less pain and less morbidity. Although both END- and EXT-DCRs provide satisfactory outcomes with similar objective and subjective success rates, we demonstrated that the endonasal approach caused significantly less pain in early postoperative period than the external approach. Clinical comfort defined by the patients was quite higher in END-DCR group, in which patients mainly were pleased to encounter a suture less surgical area. [8]. We noticed that as experiences progressed our success rate also got better. A learning curve of the endoscopic procedure was demonstrated in several studies, with higher success in more experienced surgeons [9].Currently, the choice of the type of surgery is associated with the experience of the surgeon, resources available in the healthcare system and patient preferences [10].

CONCLUSION

External DCR was the choice of surgery for acquired nasolacrimal duct obstruction (NLDO) over a decade with a very good success rate. In comparison endonasal DCR of recent origin had a success rate which was almost equivalent to external approach. Both

the approaches should be explained to the patient before surgery where both facilities are available.

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