

External Versus Endonasal Dacryocystorhinostomy: A Hospital Based Comparative Study

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Abstract

Objectives: This study was to compare the surgical outcome, quality of life and patients satisfaction of external versus endonasal dacryocystorhinostomy surgical procedure of patients with nasolacrimal duct obstruction in a tertiary care centre. **Methods:** The external DCR surgery was performed by the standard technique. The mechanical endoscopic endonasal approach included enlargement of the bony ostium using a diamond burr, full length opening of the lacrimal sac and approximation of nasal and lacrimal sac mucosal edges. No sutures were used. Silicone intubation with internal silicone bolster was performed in all external and endonasal DCR cases. All surgical procedures were performed under general anesthesia. Data was recorded in prescribed performa. **Results:** Average surgical time of external DCR and endonasal DCR were 57 minutes and 49 minutes respectively. Average score of symptomatic relief of external DCR and endonasal DCR were 3.49 and 3.46 respectively. Fluorescein in nose (functional success) was seen in 91% external DCR and 91.6% cases of endonasal DCR. Intraoperative hemorrhage was seen in 19% cases of external DCR and 91.6% cases of endonasal DCR. Post operative hamorrhage was seen in 7.8% cases of external DCR and 7.2% patients of endonasal DCR. Infection was seen in 4.7% patients of external DCR. Average duration of follow up of external DCR patients was 9.1 months and endonasal DCR was 9.4 months. Average 3.3 months Silicon intubation was performed for external DCR patients and 3.4 moths for endonasal DCR patients. Patient satisfaction was greater in endonasal DCR (average score: 9.2 out of 10) as compared to external DCR (average score: 8.7). **Conclusions:** Both surgical procedures (external DCR and endonasal DCR) have a high degree of success. But the endonasal DCR surgical procedure is the most common choice of the patients due to its minimally invasive nature, high patient satisfaction and high success rates.

Key words: External DCR, Endonasal DCR, Surgical outcomes

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Introduction

Dacryocystorhinostomy (DCR) is a surgical procedure that restores communication between the tear sac and the adjacent nasal cavity [1]. Standard treatment for nasolacrimal duct obstruction has been dacryocystorhinostomy (DCR) surgery. The external approach is performed through a cutaneous incision to access the lacrimal sac. The procedure gained popularity due to its efficacy and relatively low complication rates. Endoscopic endonasal DCR has gathered momentum with direct visualization under endoscopic guidance. Caldwell first introduced the endonasal approach for lacrimal surgery in 1893. However endoscopic endonasal DCR has only become recently employed with new endoscopy instruments and technique [2]. This approach avoids an external scar and neurovascular disruption along the tract exposing the lacrimal sac.

The apparent advantages of endonasal DCR over external DCR are its less invasive nature, shorter operative time and preservation of pump function of the orbicularis oculi muscle due to the absence of an external skin and orbicularis incision [3]. Absence of an external scar, minimal morbidity and low complication rate have made endonasal DCR popular. The disadvantages of endonasal DCR include a relatively smaller opening between the lacrimal sac and nasal cavity, high equipment cost and steep learning curve and some of these disadvantages are known to influence the success rate. Despite the advantages, the general impression is that endonasal DCR has a lower success rate than external DCR [3].

The reported success rates of both procedures range from 63% to 97% [4,5]. The wide range of success is likely due to surgical variability, patient demographics, and lack of standardized outcome measures

in the medical literature. Objective of our study was to compare the surgical outcome, quality of life and patients' satisfaction of external versus endonasal dacryocystorhinostomy surgical procedure of patients with nasolacrimal duct obstruction in a tertiary care centre.

Material & Methods

This present study was conducted in the Department of Ophthalmology with the collaboration of Department of ENT, VCSG GIMS & R Srinagar, Uttarakhand, India during a period from January 2022 to February 2022. Entire subjects signed an informed consent approved by institutional ethical committee of VCSG GIMS & R Srinagar was sought. A total of 30 patients of primary acquired nasolacrimal duct obstruction were enrolled in this study.

Methods:

All the surgical procedure was performed by lacrimal surgeon. The external DCR surgery was performed by the standard technique. The mechanical endoscopic endonasal approach included enlargement of the bony ostium using a diamond burr, full length opening of the lacrimal sac and approximation of nasal and lacrimal sac mucosal edges. No sutures were used. Silicone intubation with internal silicone bolster was performed in all external and endonasal DCR cases. All cases were performed under general anesthesia.

Data recorded are as follows:

1. Surgical time (in minutes from LA administration to removal of drapes).
2. Symptomatic relief (1–4): 1 = no improvement; 2 = marginal improvement; 3 = considerable improvement; 4 = complete resolution of epiphora symptoms).
3. post-operative visits-Functional Endoscopic Dye Test (FEDT) or

visualization of fluorescein dye at the ostium.

4. Intraoperative hemorrhage requiring intervention.
5. post-operative (within 7 days) hemorrhage requiring intervention.
6. Infection.
7. Wound dehiscence.
8. Duration of Follow-up.
9. Time of removal of silastic tube.
10. Patient satisfaction (1 = extremely dissatisfied to 10 = extremely satisfied).

The surgery was suggest as successful if at the last follow up appointment the patient

scored 3 or above for symptom resolution and had fluorescein dye visualization at the nasal opening (i.e. functionally patent). 3 to 14 months follow up was performed to all cases of surgery.

Observations

A total of 30 patients of nasolacrimal duct obstruction were enrolled in this study. Among them, 15 patients under went for external DCR surgery and 15 underwent endonasal DCR surgery. Male and female ratio was 2:1.

Table 1: Surgical outcomes

	External DCR	Endonasal DCR
Surgical time (min)	57	49
Symptomatic relief (score out of 4)	3.49	3.46
Fluorescein in nose (functional success)	91%	91.6%
Intra-op hemorrhage	19%	15%
Post-op hemorrhage	7.8%	7.2%
Infection	4.7%	0%
Wound dehiscence	0%	0%
Duration of follow-up (months)	9.1 months	9.4 months
Silicone intubation (months)	3.3	3.4
Patient satisfaction (out of 10)	8.7	9.2

In this present study, average surgical time of external DCR and endonasal DCR were 57 minutes and 49 minutes respectively. Average score of symptomatic relief of external DCR and endonasal DCR were 3.49 and 3.46 respectively. Fluorescein in nose (functional success) was seen in 91% external DCR and 91.6% cases of endonasal DCR. Intraoperative hemorrhage was seen in 19% cases of external DCR and 91.6% cases of endonasal DCR. Post operative hamorrhage was seen in 7.8% cases of external DCR and 7.2% patients of endonasal DCR. Infection was seen in

4.7% patients of external DCR. Wound dehiscence was not seen in any cases of external DCR and endonasal DCR. Average duration of follow up of external DCR patients was 9.1 months and endonasal DCR was 9.4 months. Average 3.3 months Silicon intubation was performed for external DCR patients and 3.4 moths for endonasal DCR patients. Patient satisfaction was greater in endonasal DCR (average score: 9.2 out of 10) as compared to external DCR (average score: 8.7). And there were not statistically significant differences seen in surgical

outcomes in patients of both surgical procedures.

Discussions

Nasolacrimal duct obstruction (NLDO) in children is usually congenital. Massage of the lacrimal sac is the main-stay of treatment in early life and often leads to spontaneous resolution. In children with persistent NLDO, a graded surgical approach is adopted, beginning with one or more attempts at probing and irrigation with or without intubation and balloon catheter dilatation.[1-5] Dacryocystorhinostomy (DCR) is the preferred treatment for those children who fail the above minimally-invasive procedures [6,7]. It is the standard procedure for primary acquired nasolacrimal duct obstruction (PANDO) for many years [8].

External dacryocystorhinostomy has shown its long-term efficacy with a success rate of over 90%. The endonasal approach to the tear ducts presents itself as a new physiological and aesthetic approach that is just as reliable as the external route and which now benefits from suitable instrumentation with an operating method as standardized as the external route [1].

In this study, we were compared the results of dacryocystorhinostomy by external route versus by endonasal route. Most of the patients 20(66.67%) were males.

In our study, all the patients presented impermeable tear ducts, which is consistent with the results of several studies such as those of Mohamed Salahuddin Ahmed et al where the tear ducts were impermeable with 50% complete blockage and 50% incomplete [9]. A study conducted Mohamed Salahuddin Ahmed et al had noted the presence of some known nasal abnormalities pre-disposing of an obstruction of the lacrymonasal duct such as deviation of the nasal septum found in 90% of cases, hypertrophy of the nasal

turbinate found in 15% of cases, sinusitis in 5% [10]. The traumatic cause is the most frequent cause of specific strictures in several series, while in ours it is rather sarcoidosis that predominates the specific strictures [10,11]. External DCR had been the major choice of surgery for years, but an unsightly skin scar on the incision, the risk of damage to the medial canthal structures, impaired function of the tear pump mechanism and even cerebrospinal fluid rhinorrhea are some of the hazardous complications of this surgery [12, 13]. Endonasal DCR has many advantages, including the conservation of the physiology of the tear pump mechanism, the absence of visible scars, the shorter operative time and an earlier postoperative recovery time [11,12]. The anatomical success rate in our series of external DCR was 91% versus 91.6 % for endoscopic DCR these rates are comparable to the rate found in several studies [12,14,15]. By the two types of (DCR), some serious complications such as orbital and subcutaneous emphysema, retrobulbar hemorrhage, medial paresis and orbital hernia are reported in the literature [16,17]. We did not observe any serious complications in our study. Intraoperative bleeding was the most common complication and was reported in 19% of cases in external DCR and 15% in endonasal DCR. Rose et al [18] defined a divergence on the results of subjective and objective success of DCR operations, suggesting that anatomical success may not be correlated with success in symptom control and vice versa. Relief of discharge-related symptoms may not be possible in all patients, especially if there is hydraulic resistance of the canaliculi and nasolacrimal ducts [12,18]. Although all the patients in our study had a patent tear lavage and a positive Functional Endoscopic [19]. In a study by Feretis et al [20] based on the GBI scale with an additional symptomatic questionnaire, by

department distributed to all patients. In this study, the results indicated positive scores for both groups, with no statistically significant difference between the results of the external and endonasal procedures. [21] The results of the ocular symptomatology questionnaire indicated better scores for the outpatient procedure, but this difference was not statistically significant. External DCR provided greater improvement in quality of life, but the difference between groups did not reach statistical significance [1].

Conclusions

This present study concluded that the both surgical procedures (external DCR and endonasal DCR) have a high degree of success. But the endonasal DCR surgical procedure is the most common choice of the patients due to its minimally invasive nature, high patient satisfaction and high success rates. And Patient satisfaction was significantly higher in the endonasal DCR surgical procedure as compared to External DCR surgical procedure.

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