

Pediatric Endoscopic Dacryocystorhinostomy

Mostafa Talaat Abd-El Hakeem

*Assistant professor of ENT, ENT dept, Minia university, Egypt,
mostafatalaat1981@gmail.com*

Adel Abdallah

Professor of ENT, ENT dept, Minia university, Egypt, adelabdelbaki@gmail.com

Rasha Abdelmoneim

*Assistant professor of ENT, ENT dept, Minia university, Egypt,
rashaahmed375@gmail.com*

Ahmed Khaleel

Assistant lecturer of ENT, ENT dept, Minia university, Egypt, ahmed.khaleel@mu.edu.eg

Raafat Mohyeldeen Abdelrahman Abdallah

*Professor of ophthalmology, Ophthalmology dept, Minia university, Egypt,
raafat.abdelrahman@mu.edu.eg*

Abstract

Objective: to assess the effectiveness and success rate for the management of resistant epiphora in children older than 4 years.

Methods: We did a prospective study on 20 children (26 eyes) complaining of epiphora. Their ages ranged from 4 to 14 years old. Cases have been chosen from those coming to ENT and ophthalmology departments of Minia university hospital with history of failed treatment of epiphora by lines other than dacryocystorhinostomy. Surgeries involved a combined ENT and ophthalmology team.

Results: pediatric DCR was done for children with epiphora unresponsive to more conservative lines of treatment such as probing, intubation or balloon dacryoplasty or when associated with nasal pathologies or recurrent dacryocystitis. The success rate for pediatric endoscopic DCR was 90%. The concomitant sinonasal pathologies are present in 45% of cases.

Conclusions: endoscopic DCR is a valuable option and good procedure for dealing with persistent childhood epiphora with lack of skin incision, preservation of the pump mechanism and the ability to address other nasal pathologies at the time of surgery.

Keywords: childhood epiphora, pediatric endonasal dacryocystorhinostomy, nasal disease.

INTRODUCTION

Congenital Nasolacrimal Duct Obstruction (NLDO) is prevalent in approximately 6% of new borns (1,2). In as many as 90%, the membrane that obstructs Hasner's valve at the

end of the nasolacrimal duct dissolves spontaneously in the first 6 months with conservative treatment alone (3).

Conservative treatment includes lacrimal sac compression and massage, lid hygiene and

topical antibiotics (4,5). Several studies (6-8) have found probing to be successful in 70% to 97% of children whose obstruction did not resolve spontaneously. Nasolacrimal intubation has been popular since its introduction in the late 1960s for the treatment of persistent NLDO after failed probing (9-13). This procedure involves probing of the nasolacrimal duct followed by placement of a silicon tube stent in one or both canaliculi.

Intubation has also been used for primary treatment of NLDO in older children when the duct feels tight during probing (10,14,15).

Pediatric DCR is indicated when NLDO is unresponsive to more conservative lines of treatment such as probing, intubation or balloon dacryoplasty or when associated with a mucocele or recurrent dacryocystitis (16). Such cases have been treated for a long time by external DCR. However, the endonasal endoscopic DCR has become widely used nowadays (17).

Aim of this study:

To assess the effectiveness and success rate for the management of resistant epiphora in children older than 4 years.

Patient and method:

We did a prospective study on 20 children (26 eyes) complaining of resistant epiphora that may be associated with nasal or nasopharyngeal pathologies during the period between December 2020 and January 2023. Their ages ranged from 4 to 14 years old. Cases have been chosen from those coming to ENT and ophthalmology departments of Minia university hospital after complete ENT and ophthalmology examination with the following inclusion criteria:

- history of failed treatment of epiphora by lines other than DCR.

- patients are fit for surgery from anaesthesia point of view

We excluded from the study:

- patients unfit for general anaesthesia

- patients with resolved epiphora by lines of treatment less invasive than pediatric endoscopic DCR.

The concomitant nasal pathologies are present in 9 (45% of) cases in the form of:

- adenoid enlargement in 6 cases

- unilateral choanal atresia in 2 cases

- unilateral fungal sinusitis in 1 case

The concomitant nasal pathologies were corrected at the same operative session.

Picture 1: adenoid enlargement



This study was approved by the ethical committee of the Faculty of Medicine, El Minia University (approval number 697:12/2020).

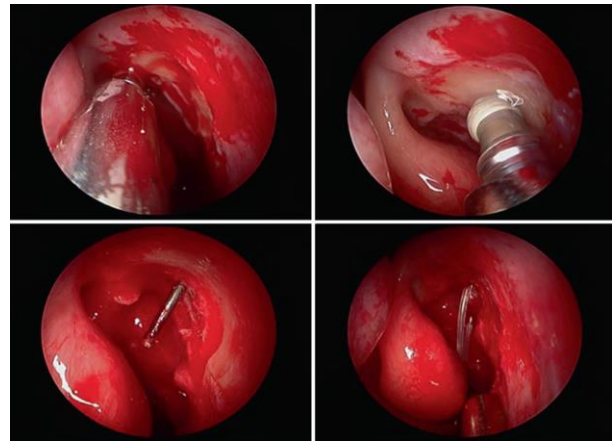
-Informed consent: Written-Informed consent taken from all patients in native language.

Surgeries involved a combined ENT and ophthalmology team.

Endoscopic DCR was performed using zero degree nasal endoscope with 2.7 mm diameter. The surgery starts with injecting the submucosa of the lateral nasal wall just anterior to the attachment of the middle turbinate with 2% lidocaine HCl with epinephrine 1:100:000. A mucosal incision was done using a sickle knife starting at the axilla of the middle turbinate. This incision extended antero-inferiorly along the maxillary line. A Freer elevator is used to lift the mucosal flap to expose the lacrimal bone and part of frontal process of maxilla. The bone covering the lacrimal sac is removed using drill to create a 1.0-1.5 cm window exposing the medial wall of the sac. The medial wall of the sac is then removed by Blakesley forceps. Patency of the opening is confirmed by sac syringing and the free flow of irrigating fluid seen by the endoscope. Silicone tube insertion was done through puncti and received under vision in the nasal cavity, and the patient was discharged at the same day after nasal suction and correction of nasal or nasopharyngeal disease in the same session if present.

Postoperatively, Patients were followed up every month for 12 months. The silicone tube was removed after 3-6 months.

Picture 2: Steps of endonasal dacryocystorhinostomy



Results

Twenty children with resistant epiphora (11 males, 9 females) that underwent endoscopic DCR surgeries; were included in this study. The mean age was 8.6 ± 3.2 years and the age range was 4 to 14 years.

Six cases had bilateral epiphora (30%) associated with adenoid enlargement. Fourteen cases (70%) had unilateral epiphora with unilateral nasal pathology present in 3 of them. No recorded significant intraoperative complications.

Postoperative complications happened in 2 patients (10%) in the form of nasal bleeding in the first postoperative day (the bleeding resolved with nasal packing for 24 hours). Successful outcome is defined as relief of symptoms plus endoscopic visualization of the patent stoma made into the lacrimal sac during sac irrigation and correction of nasal or nasopharyngeal disease at the time of surgery. Accordingly, 18 patients (90%) showed success of surgery and endoscopic revision DCR was done in the 2 cases with recurrent NLDO.

Discussion

Our study demonstrated that pediatric endoscopic DCR is safe for pediatric population. It is highly successful as compared to external DCR (18,19). The endoscopic DCR has many advantages that it avoids skin incision, preservation of the pump mechanism and the ability to address and correct other nasal pathologies at the time of surgery.

Endoscopic DCR is indicated for children with persistent nasolacrimal duct obstruction which are refractory to probing and in cases of recurrent or chronic dacryocystitis (19). In Our study majority of children undergo probing twice before referral to surgery. Early referral, followed by early endoscopic DCR in children reduces the risk of lacrimal stenosis, which is often exacerbated by repeated infection or probing (20,21).

In our study resolution of symptoms found in 90% cases. No major complications were reported in our study. Eloy et al. (22) achieved a complete resolution of symptoms in 9 out of 10 primary DCR surgeries in children.

Leibowitch et al. (23) in their study of 26 cases, reported that they achieved a clinical success rate of 92.3%.

A study by Bernal-Sprekelsen et al. did show good results from endonasal DCR in a series of 24 children on 31 sides with a mean age of 5.6 years (2–14 years). After a primary endonasal DCR, there was a patency rate of 90.3%, which improved to 100% after a revision (24).

Komi'nek et al. (18) reported an overall success rate of 87.9% among 58 pediatric patients at a mean follow-up of 17 months.

Conclusion

Endoscopic DCR is a valuable option and good procedure for dealing with persistent childhood

epiphora with lack of skin incision, preservation of the pump mechanism and the ability to address other nasal pathologies at the time of surgery.

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