

Endoscopic ‘syringe and cutdown’ technique for nasolacrimal duct obstruction in children

BY VANUSHIA THIRUMAL, UNA O’COLMAIN, RICHARD GREEN AND PETER D ROSS

This article presents a novel yet simple technique to help in the management of congenital NLDO. The authors propose it as a valuable addition to existing standard procedures.

Congenital nasolacrimal duct obstruction (NLDO) is a condition encountered within the first few weeks of life, causing persistent epiphora due to the blockage of the natural lacrimal drainage system. The incidence has been reported to range from 5% to 20% [1]. By one year of age, 96% of obstructions will resolve without surgical intervention [2]. To capitalise on the high frequency of spontaneous resolution, we encourage the assessment and management of this condition towards the age of two years old. NLDO is commonly due to a membrane at the distal end of the nasolacrimal duct known as the valve of Hasner [1]. Distal obstructions affecting the lacrimal sac, duct and valve present with mucopurulent discharge and are most amenable to this technique. Proximal obstructions affecting the puncti and canaliculi, however, present with watery discharge and are not amenable to this surgical approach.

For those whose obstruction does not resolve with conservative measures of waiting and Crigler massage [3], lacrimal probing is the traditional procedure, with success rates from 78% to 97% [4,5]. This is commonly performed as a blind procedure with complications including false passage formation, granuloma formation, tissue necrosis, chronic inflammation, ongoing NLDO and trauma to nasal structures. Probing under nasal endoscopic guidance is recommended to prevent these complications [6].

If symptoms persist after probing, endoscopic endonasal DCR is usually the next line treatment option.

We have found the technique of syringe and cut down a useful and successful addition to the traditional algorithm. We propose a management algorithm as per Figure 1.

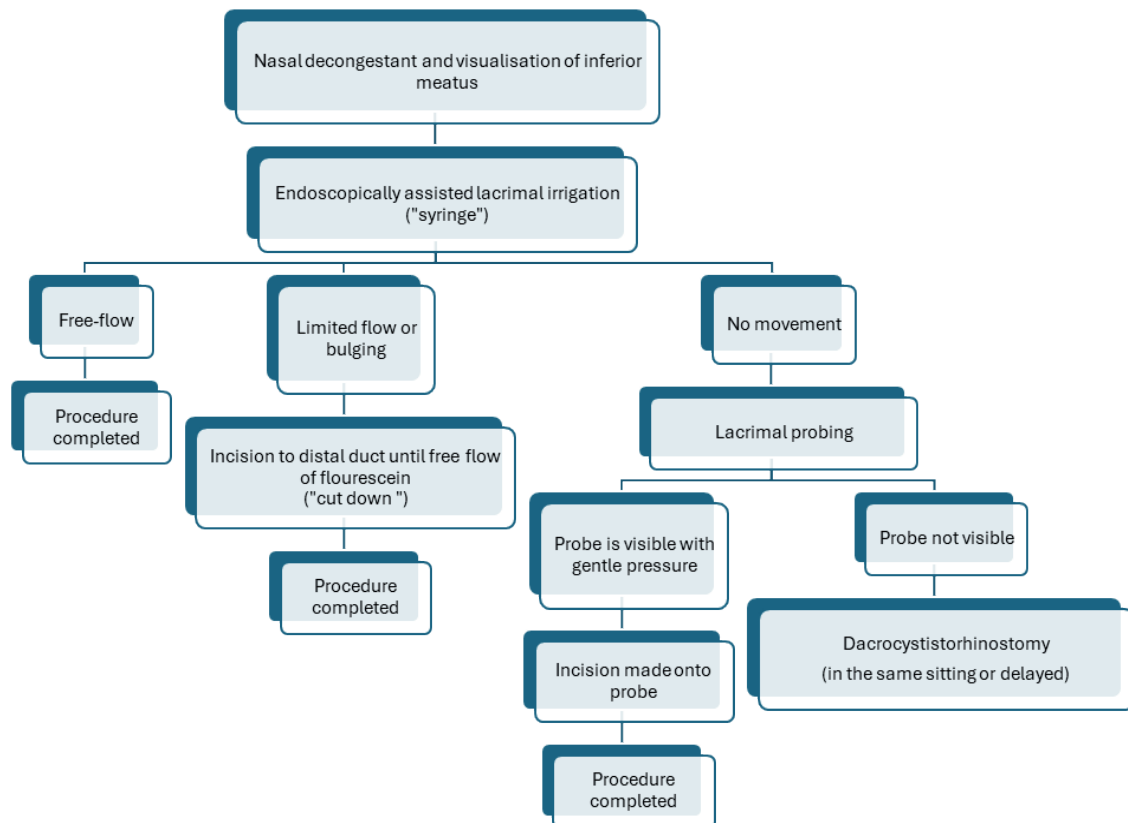


Figure 1: Management for CNLDO.

“All who attended had successful outcomes and resolution of symptoms”

Technique

This is a two-person technique involving an ophthalmologist and rhinologist, and utilises an endoscope to view the region of the valve of Hasner in the inferior meatus intranasally. This allows a small incision to be made to the inferior aspect of this area under the inferior turbinate, in order to relieve the obstruction.

Step 1 – setup and pre-decongestion

We begin with the patient lying supine under general anaesthesia. Paediatric intranasal Xylometazoline 0.05% is instilled by the anaesthetist to decongest the nasal cavity. The ophthalmologist stands at the head-end of the table and the rhinologist stands on the patient's right side. A Karl Storz Endoscopy Stack system is set up with a 0° 3mm rigid nasendoscope to inspect the nasal cavity (Figure 2).

Step 2 – intraoperative decongestion and visualisation of inferior meatus

Decongestant in the form of 1 in 1000 adrenaline-soaked patties are placed in the nasal cavity medial and lateral to the inferior turbinate (Figure 3). Care is taken to gently medialise the inferior turbinate to visualise the inferior meatus.

Step 3 – irrigation

The ophthalmologist uses a 2ml syringe and 25G lacrimal cannula to administer diluted fluorescein dye into the superior lacrimal canaliculus; a punctum dilator may be required to facilitate this. The dye collects in the lacrimal sac and this is visualised endoscopically at the valve of Hasner when the mucosa bulges with hydraulic pressure from the syringing.

Step 4 – incision

An incision of the valve of Hasner membrane (Figure 4) is made with a 2.75mm keratome (phacoemulsification surgery blade). The ophthalmologist re-injects fluorescein through to confirm free flow into the nasal cavity and the procedure is completed. However, if there is still persistent resistance to free flowing fluorescein dye, probing is performed under endoscopic visualisation as per the algorithm in Figure 1. Excess dye is suctioned from the nasal cavity. Chloramphenicol 0.5% eye drops can be instilled in the eye at the end of the procedure. Naseptin can be applied intranasally if there is any concern of trauma or bleeding.

Step 5 – postoperative care

The patient is discharged on the day; no postoperative medications are given.

“The ‘syringe and cut down’ technique reduces the number of paediatric patients needing full lacrimal probing or DCR”

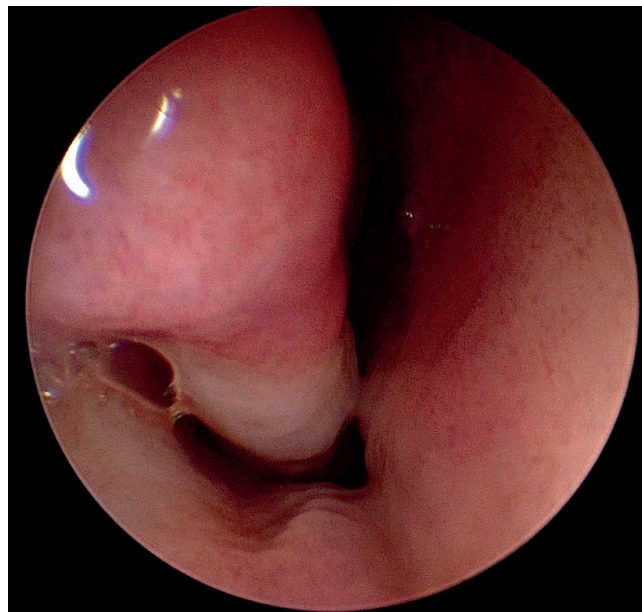


Figure 2: Endoscopic view of right nasal cavity.

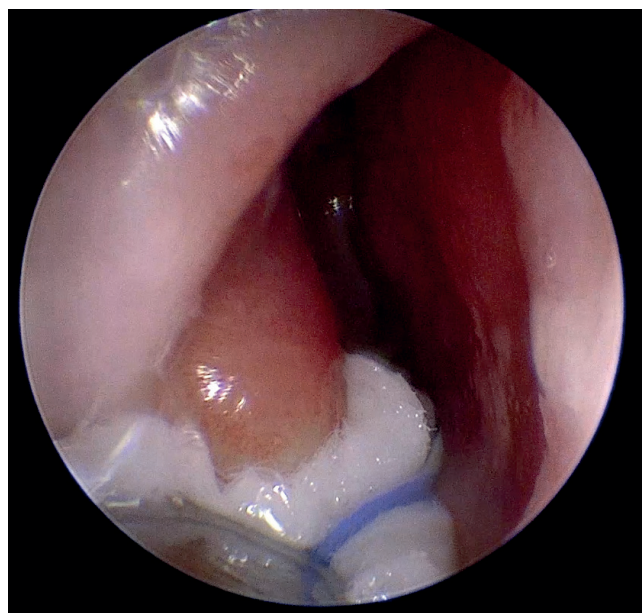


Figure 3: Adrenaline-soaked patties placed in inferior meatus.

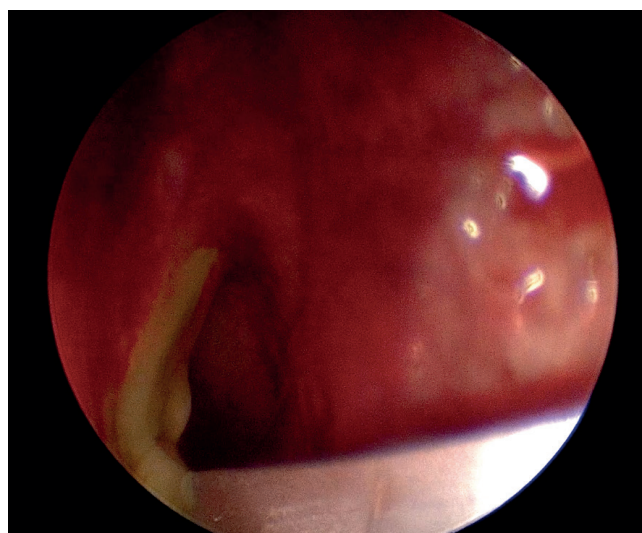


Figure 4: Syringe and cutdown performed under direct visualisation.

HOW I DO IT

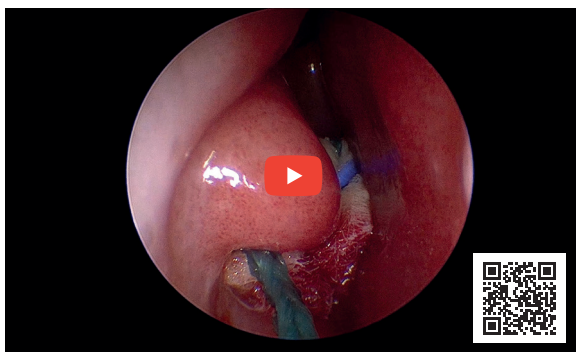
Key learning points

A review was carried out in our tertiary hospital to determine the success rate of this syringe and cut down technique for mucocoeles. This was a retrospective study of 15 patients from 2015–2021, aged 15 months to four years. Of these, 93% (14 patients) attended the three-month follow-up. All who attended had successful outcomes and resolution of symptoms. One case involved an immediate postoperative complication with epistaxis which self-resolved. One patient did not attend follow-up and has not re-presented to the department. In our experience, this technique has comparable success rates with other distal causes of NLDO including imperforate valve and stenosis.

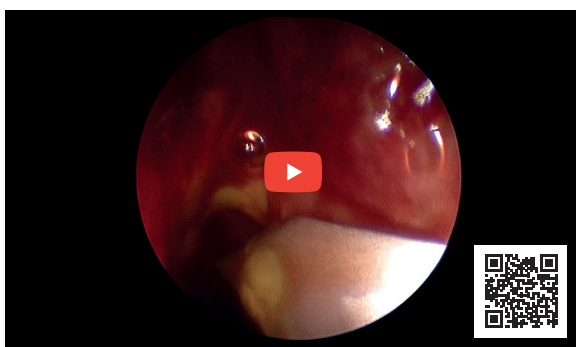
- The 'syringe and cut down' technique reduces the number of paediatric patients needing full lacrimal probing or DCR.
- It achieves high success rates while maintaining safety and reducing the risk of complications, such as recurrence or false passage formation seen in traditional external technique.

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Scan this QR code to watch a video of the setup and intraoperative decongestion of the inferior turbinate.



Scan this QR code to watch a video of the inferior meatus, irrigation and incision of the valve of the Hasner membrane.

AUTHORS



Vanushia Thirumal, MbChB, CertMedEd, MRCS(ENT),

ENT Registrar East of Scotland, Ninewells Hospital, NHS Tayside, Dundee, UK.



Una O'Colmain,

Consultant Ophthalmic Surgeon, Ninewells Hospital, NHS Tayside, Dundee, UK.



Richard Green, FRCS, ENT,

Consultant Rhinologist, Ninewells Hospital, NHS Tayside, Dundee, UK.



Peter D Ross, MBChB, FRCS (ORL-HNS), FRCS (Ed),

Consultant Rhinologist & ENT Surgeon, Ninewells Hospital, NHS Tayside, Dundee, UK.

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SECTION EDITOR



Prof KW Ah-See, MD, FRCS, FRCS(ORL-HNS),

Consultant ENT Head and Neck Surgeon, NHS Director of Undergraduate Medical Education, Department of Otolaryngology Head and Neck Surgery, Aberdeen Royal Infirmary, UK.

kim.ah-see2@nhs.scot