Results of Early Probing in Cases of Congenital Nasolacrimal Duct Obstruction

KHALED HAMDY MAHMOUD, M.D., F.R.C.S.Ed. and YASSER M. MOSTAFA, M.D.
The Department of Ophthalmology, Research Institute of Ophthalmology, Giza, Egypt.

Abstract

Purpose: To evaluate the efficacy of early intervention in cases of congenital NasoLacrimal Duct Obstruction (NLDO). Also, to find the possibility of occurrence of additional side effects.

Methods: The study involved thirty-three patients diagnosed as nasolacrimal duct obstruction of congenital origin between 2003 to 2005. These patients were submitted to early intervention by probing and irrigation under general anaesthesia between the age of 6 to 9 months. The success of the procedure was defined as complete resolution of signs and symptoms. The follow up period ranged from six to 18 months postoperatively.

Results: The success rate was 90.48%, out of thirty-three patients, thirty patients showed complete cure after first attempt of probing and did not need any further interference or additional treatment. No serious complications were noticed to occur in this age group.

Conclusion: Probing is highly successful in the younger age group and proved to be a safe procedure. This encourages us to use probing as first line of treatment starting from six months of age in cases of congenital nasolacrimal duct obstruction.

Key Words: Early probing – Congenital nasolacrimal duct obstruction.

Introduction

OBSTRUCTION of the nasolacrimal drainage system is fairly common in the pediatric age group, occurring in as many as 20-30% of newborns [1,2]. But only 1% to 6% of these children become symptomatic [1-3]. Spontaneous resolution occurs in 80-96% of affected infants by one year of age [1-4]. In patients in whom the condition persists, the common cause is failure of the nasolacrimal duct to canalize [4].

The timing of probing for congenital nasolacrimal duct obstruction has been a matter of controversy in recent years. When the condition persists beyond several months, early office probing gives good results.

An equally effective approach is conservative management until 9-12 months of age awaiting spontaneous resolution, followed by hospital-based probing for persistent obstruction [5].

A confounding question is whether probing is less successful when delayed, perhaps due to prolonged inflammation in the lacrimal duct system or could the apparent decline in success rate in older children is due to accumulation of more severe obstruction as less severe obstruction clears spontaneously [5,6]. It has been reported that delay in probing beyond 13 months is associated with a lower rate of success and this worsens with age [7-9]. Conversely, there are studies which indicate that primary probing continues to be an effective treatment well beyond 2 years of age and that the cure rate does not vary markedly with age [5,6,10,11]. There are thus no clear guidelines for management of congenital nasolacrimal duct obstruction, especially for older children.

Earlier intervention aims to prevent the occurrence of prolonged inflammation in the lacrimal drainage system and to avoid its possible late side effects and inconvenience.

This study was undertaken to evaluate the results of probing in children aged 6 to 9 months. The data presented here were taken from patients who were seen and treated by the authors.

Material and Methods

A prospective clinical study was done including 33 children presenting with unresolved epiphora at the age of 6 months and undergoing probing for congenital nasolacrimal duct obstruction. The initial examination included looking for the lacrimal puncta, assessing anomalies of the lids or face, ruling out conjunctivitis, allergic inflammation and other causes of epiphora in children. The diagnosis
of congenital nasolacrimal duct obstruction was based on history of tearing and/or discharge and on clinical examination as evidenced by epiphora beginning during the first few weeks of life, recurrent mucopurulent discharge and reflux of the contents of lacrimal sac on pressure.

The procedure was performed under general anaesthesia. A Bowman's probe was used in all cases. Probing in all cases was done through the upper puncta. Bowman's probe size 00, which measures 0.9mm in diameter, was used in all cases because it has the proper stiffness for paediatric use. The probe was introduced into the canaliculus until medial wall of the lacrimal fossa was felt; at this point, it was turned and introduced into the nasolacrimal duct and gently advanced until resistance was felt. The breaking of the membrane was felt as the probe advanced into the obstruction. The patency of the nasolacrimal system was checked by obstruction of the upper puncta using a punctum dilator and irrigation with saline from the lower puncta. The saline was colored with 2% fluorescein dye. Flow of saline in the throat was confirmed by placing a paediatric size suction catheter in the throat and detecting fluorescein stained saline through it. Each patient received gentamicin sulphate 0.3% eye drops four times daily for one week.

Patients were seen in the clinic at one week, one month and then every three months after probing. Success of probing was the main outcome measure and was defined as complete remission of watering, discharge and reflux of contents of the lacrimal sac on pressure at one week of the procedure.

The follow-up period ranged from six to 18 months.

**Results**

Thirty out of the thirty-three included patients showed complete clearance of watering, discharge and reflux immediately at the first postoperative visit, with a success rate of 90.48%. Two patients showed transient improvement with late recurrence of the same symptoms. The recurrence time ranged from one to three months, while one patient showed primary failure of the procedure with a total failure rate of 9.52%. None of the patients had any surgery or anaesthesia related complication.

We encountered two types of obstructions during the probing procedure, simple and complex. In simple obstruction, the resistance could be easily bypassed with the help of the Bowman's probe and post-probing syringing revealed a patent lacrimal system. This was the case in thirty-two patients with a percentage of 96.96%. One patient showed complex obstruction, the probe could not be passed and there was firm resistance to its passage. Post probing syringing was not patent in this patient.

**Discussion**

The lacrimal drainage system begins forming at approximately 6 weeks of gestational age as a depression, termed the lacrimal groove. A solid cord of ectoderm is eventually buried as the mesoderm develops and extends from the eyelids to the nose. Canalization of the cord begins at approximately 3.5 months of gestational age and is usually completed at or near the time of birth, with the lower level of the system being the last to open. Anomalies may occur anywhere along the course of the system [1-3]. Atresia of the nasolacrimal duct or dacryostenosis is the most common cause of epiphora in paediatric population. It is thought to result from failure of the canalization of the column of epithelial cells that form the nasolacrimal duct. The most common site of obstruction is at the mucosal entrance into the nose (valve of Hasner) under the inferior turbinate [3].

Probing has been a time proven treatment for congenital nasolacrimal duct obstruction. But there is controversy regarding the timing of probing and its outcome in older children [6,8,9,12]. Traditional options include office probing with topical anaesthesia at the age of 4 to 6 months or observation and medical management followed by probing under general anaesthesia at approximately 12 months [6].

Advocates of early probing suggest that early correction avoids months of morbidity due to epiphora and chronic dacryocystitis. They also suggest that postponement of the procedure may result in decreased success with simple probing because of chronic inflammation and secondary fibrosis [6,8,9,12]. Early probing can be done without anaesthesia, as it is easier to restrain the infant. The possible complication of early office probing is creation of false passage or damage to the lacrimal epithelium, which might produce stenosis and actually prevent later spontaneous resolution of the obstruction, a finding documented by Al-Hussein and Nasr [13]. They reported a 44% incidence of canalicular stenosis after failed probing.

Present study shows encouraging results of probing in younger children between 6 & 9 months with cure rates of 90.48% and with minimal operative and postoperative complications.
Advocates of the late probing comment on large number of infants in whom spontaneous resolution of the obstruction negates the need for probing in first place [5,6,10,11]. This is well illustrated by Mac Ewen and Young, who followed a cohort of nearly 5000 infants and 96% children had spontaneous remission of their obstruction by age one [14].

Robb [6], El Mansoury et al. [11] and Zwaan [15] have reported an insignificant effect of the increasing age on the success rate of initial probing after the age of 12 months.

Honavar et al. [5], Kushner [10] and Kashkouli et al. [16] showed that congenital nasolacrimal duct obstruction could be either membranous or complex. They suggested that younger children with membranous or simple obstruction would have a good success rate for probing irrespective of the age at probing. The complex obstruction (firm, non-membranous, or complicated) has been identified as a major risk for the probing failure. All the failed cases in this study had a firm obstruction, explaining the cause for failure of probing in these cases. It seems possible that the success of probing is dictated not by the age at probing, but by the cause of obstruction. The simple or membranous obstruction is cured by simple probing while complex or more severe obstructions might not open by simple probing and may require further surgical intervention at a later age.

Despite the controversy about the age of primary intervention, probing should remain the primary surgical option for congenital nasolacrimal duct obstruction in children. Further attempts should be done to clarify and improve its efficacy and minimize possible complications.

**Conclusion:**

Probing is highly successful in the younger age group and proved to be a safe procedure. This encourages us to use probing as first line of treatment starting from six months of age in cases of congenital nasolacrimal duct obstruction.

**References**


