

Initial Late Probing for Congenital Nasolacrimal Duct Obstruction, Rate of Success and Factors Associated with Failure

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ABSTRACT

AIM: Evaluation of the efficacy of initial late probing for congenital nasolacrimal duct obstruction and identifying the risk factors associated with failure.

MATERIALS AND METHODS: A prospective interventional case series included 25 patients with congenital nasolacrimal duct obstruction (CNLDO) aged 2 years or older, with no previous intervention. The diagnosis was based on clinical findings (epiphora, discharge, regurge test and FDDT). Probing of the nasolacrimal duct under general anesthesia was done. The presence of firm or hard resistance during probing of the nasolacrimal duct was recorded as a complex obstruction; otherwise the obstruction was recorded as simple one. Success was predefined as resolution of symptoms and signs that persisted 3 months postoperative. Another probing was done when necessary before considering the final outcome as failure.

RESULTS: The age of patients ranged from 2-6 years (average age 2.96±0.81 years). Seven patients (28%) needed a second probing. The presence of chronic dacryocystitis was significantly associated with higher incidence of need for 2nd probing (66.7%, $p=0.001^*$). The overall success rate was 84% (21 patients). The success of procedure was significantly lower in patients with complex obstruction (33.3%, $p=0.011^*$). The outcome of probing was not affected by the age of the patients ($P=0.381$).

CONCLUSION: Initial late probing is a good option for older children with CNLDO. The presence of chronic dacryocystitis is associated with higher incidence of need for 2nd probing, while the complex obstruction is a risk factor associated with significantly lower success rate.

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Key words: CNLDO; Probing; Late probing

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INTRODUCTION

Congenital nasolacrimal duct obstruction (CNLDO) affects up to 20% of all newborns^[1,2]. Spontaneous resolution occurs in 80% to 96% of affected infants^[3,4]. Affected children will present with epiphora, chronic or recurrent conjunctivitis, or eye discharge, which may progress to frank cases of acute dacryocystitis^[5].

Lacrimal sac massage, originally described by Grigler in 1923, generally is adopted as the initial treatment. The primary aim of massage is to increase the hydrostatic pressure in the nasolacrimal duct so as to rupture any membranous obstruction. A secondary advantage is that it also empties the sac of stagnant tears, which is a good medium for infection^[5,6].

When the condition persists beyond several months, early office or hospital based probing around the age of one year yields good result^[7,8]. Although the results of probing in children younger than 2 years are predictably good, controversy exists regarding the outcome of probing in older children^[2,9].

The aim of this study was to evaluate the success of probing in children 2 years or older presented with CNLDO, and to find risk factors associated with failure of probing in those children.

METHODS

The study included 25 eyes of 25 patients aged 2 years or older presented with CNLDO to Oculoplasty unit, Tanta University Eye Hospital. The diagnosis of CNLDO was based on history of epiphora, and or discharge since the first few weeks of life. This was confirmed with clinical examination including non inflamed conjunctiva, increased tear meniscus height, regurge test and fluorescein dye disappearance test (FDDT). Patients with history of previous probing, history of trauma, punctual agenesis, and associated ocular disease were not included in the study. Different surgical options were discussed with the parents and informed consent was obtained. The study adhered to the principles of the declaration of Helsinki, and has been approved by the institutional ethical committee.

The probing was done under general anesthesia, in stepwise manner using Bowman's probe size 00, followed by probes size 0, then 1, 2, 3. Probing was done through the upper punctum, and then passed through the canaliculus till the hard feel of the medial wall of the lacrimal fossa was felt. The probe was turned to enter the nasolacrimal duct (NLD), and gently advanced till resistance was felt. The probe was then advanced to overcome the obstruction. When a firm or hard resistance was encountered during probing, this was recorded as complex NLD obstruction. Patency was confirmed by irrigating fluorescein stained saline, and its flow was detected by placement of pediatric size suction catheter in the nose. Patients then received Tobradex eye drops (Alcon) 4 times daily for 1 week.

The patients were seen 1 week, 1 month, and 3 months postoperative. They were evaluated for resolution of symptoms and objectively using FDDT. Another probing was done after 4-6 weeks in cases with persistent manifestations. The patients' data were analyzed using the mean, standard deviation and chi-square test by windows SPSS V.16.

RESULTS

The study included 25 patients, 12 males (48%), and 13 females (52%). The age ranged between 2 and 6 years with a mean age of 2.96±0.81 years (mean±SD). Sixteen patients (64%) had epiphora with negative regurge test, while 9 patients (36%) had chronic dacryocystitis with positive regurge test. During the probing, 3 patients (12%) were found to have complex obstruction. One of them had positive regurge test.

One month postoperative, 18 patients (72%) were epiphora free with negative FDDT, while 7 patients (28%) had persistent manifestations, and needed another probing. Six of these 7 patients (85.7%) had chronic dacryocystitis, and one of them had also complex obstruction. The presence of chronic dacryocystitis was significantly associated by failure of first probing, and need for repeating the procedure. Failure of first probing in patients with positive regurge test had a rate of 66.7% (*P* value=0.001*) (Table 1). The second probing was successful in 3 (42.86%) patients, and failed in 4 (57.14%) patients.

By the end of follow up period, 21 patients (84%) had successful outcome, while 4 patients (16%) failed. The success of procedure had no relation to the age of patients. The mean age of successful cases was 3.02±0.79 years, while in failed cases it was 2.62±0.94 years (*P* value=0.381). The type of obstruction significantly affected the

outcome. The success rate among cases with complex obstruction was 33.3% (1 of 3 patients) compared to 90.9% (20 of 22 patients) in patients with simple obstruction (*P* value=0.011*). The outcome was also affected by the presence of chronic dacryocystitis with positive regurge test. The success rate was 93.75% (15 of 16 patients) in cases with negative regurge test. While in patients with positive regurge test the success rate was 66.7% (6 of 9 patients), but the difference was statistically insignificant (*P* value=0.076). (Table 2).

DISCUSSION

Probing of the NLD is a standard therapeutic procedure in the management of the CNLDO. Controversy, however, exists regarding the outcome of initial probing in children 2 years or older^[10].

In this study, an overall success rate of 84% was found, which is comparable with the success rate in early probing done around the first year of life. Kashkouli *et al*^[10], Elmansoury *et al*^[11], Zwaan *et al*^[12], and Honavar *et al*^[13] found similar high success rate over 80% in initial late probing. No correlation was found between the age of patients and the result of probing. A similar finding was recorded by Mannor *et al*^[9].

On the other hand, Sturrock *et al*^[14] found initial probing less successful after the age of 2 years. Katowitz and Welsh^[2] found that late management of CNLDO not only decreases the cure rate, but also increases the number and complexity of future procedure. Maheshwari R and Maheshwari S^[15] found that age older than 5 years significantly affected the outcome. We had only one patient older than five years old, so we couldn't study such effect.

Two factors were incriminated in the lower cure rate with probing in older children. It was suggested that it might be a result of chronic infection and fibrosis with increasing age^[2,16]. In this study, 85.7% of patients who needed a second probing had chronic dacryocystitis. The presence of chronic dacryocystitis with positive regurge test was significantly associated by failure of first probing, and need for repeating the procedure. Success of first probing in patients with positive regurge test had a rate of 33.3%. But this increased to 66.7% after the second probing.

Paul and shepherd^[17] assumed that lower success in older children might be due to a self selection process. These children may represent the pool of children with more complicated type of obstruction.

Kashkouli *et al*^[10] and Honavar *et al*^[13] showed that the complex CNLDO was more likely to be found in older children, with subsequent lower success rate. Kushner^[18] even suggested that a reasonable approach to older children with a CNLDO is to plan a probing procedure with possible alternative surgical plans if a

Table 1 The effect of age, regurge test, and type of obstruction on the results of 1st probing.

| | | Success | Failure | P. value |
|---------------------|----------|------------|-----------|----------|
| Age | | 3.08±0.84 | 2.64±0.69 | 0.223 |
| Regurge test | Negative | 15(93.75%) | 1(6.25%) | 0.001* |
| | Positive | 3(33.3%) | 6(66.7%) | |
| Type of obstruction | Simple | 17(77.3%) | 5(22.7%) | 0.112 |
| | Complex | 1(33.3%) | 2(66.7%) | |

Table 2 The effect of age, regurge test, and type of obstruction on the final results.

| | | Success | Failure | P. value |
|---------------------|----------|------------|-----------|----------|
| Age | | 3.02±0.79 | 2.62±0.94 | 0.381 |
| Regurge test | Negative | 15(93.75%) | 1(6.25%) | 0.076 |
| | Positive | 6(66.7%) | 3(33.3%) | |
| Type of obstruction | Simple | 20(90.9%) | 2(9.1%) | 0.011* |
| | Complex | 1(33.3%) | 2(66.7%) | |

complex obstruction is found. In this study, 3 patients only had complex NLDO. Lower success rate (33.3%) in patients with complex obstruction was found compared to 90.9% success rate in simple obstruction. The study was limited by the relatively few number of patients included, which can be explained by the increased early management of CNLDO with few patients presented older than 2 years.

In conclusion, the success rate of initial late probing was found comparable with success rate in early probing done around the age of 1 year, justifying its use as a primary therapy for CNLDO in patients presented with age 2 years or older. The presence of chronic dacryocystitis is associated with higher incidence of need for 2nd probing, while the complex obstruction is a risk factor associated with significantly lower success rate.

CONFLICT OF INTERESTS

The authors have no conflicts of interest to declare.

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