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Nasolacrimal duct obstruction: the correlation between success rates of probing and age

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泪道探通术治疗鼻泪管阻塞的成功率与年龄之间的相关性

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摘要

目的:探讨探通术的成功率与鼻泪管阻塞(nasolacrimal duct obstruction, NLDO)患者年龄之间的相关性。

方法:患者 120 例行探通术,并分为 3 个年龄组:第 1 组(<12mo),第 2 组(13~24mo),3 组(25~60mo)。所有患者先行保守治疗,阻塞未消除,然后行探通术作为替代治疗,并比较三组间的探通术治愈率。

结果:组 1,2,3 的成功率分别为 94.3%, 83.3%, 68.4%。三组间的治愈率有显著的差异(P=0.017)。

结论:早期行探通术可取的较高的成功率。根据我们的观察, NLDO 患者早期干预,最好在出生后 2a 以内,效果肯定。

关键词:鼻泪管阻塞; 探通术; 成功率; 年龄

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Abstract

• AIM: To determine the correlation between success rate of probing and age in patients with nasolacrimal duct obstruction (NLDO).

• METHODS: A total of 120 patients who underwent probing were studied. Patients were divided into three age categories: group 1 (younger than 12 months), group 2 (between 13 to 24 months), and group 3 (between 25 to 60 months old). At first conservative management was initiated for all patients, but the obstruction didn't resolve so probing was performed as an alternative treatment. The cure rate of probing was compared between the three categories.

• RESULTS: The success rate in groups 1 to 3 was 94.3%, 83.3%, and 68.4% respectively. Cure rate of probing differed significantly between the three groups (P=0.017).

• CONCLUSION: Probing is associated with a higher success rate if performed early in life. Based on our observation, early intervention for NLDO, preferably in the first two years, is warranted.

• KEYWORDS: nasolacrimal duct obstruction; probing; success rate; age

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INTRODUCTION

Congenital nasolacrimal duct obstruction (NLDO) is a common abnormality in nasolacrimal drainage system occurring in as many as 20% of newborns[1]. Infants with NLDO present with epiphora (overflow of tears) and recurrent purulent discharge. Also gentle pressure applied over the lacrimal sac may result in a mucopurulent reflux[2].

Many reports have confirmed high frequencies of spontaneous resolution during the firstyear of life[1,3-4]. Accordingly, a conservative approach, is judged to be the best option in infants aged <1 year. Conservative management includes lacrimal sac massage, proper lid hygiene and topical antibiotics[5-7]. Failure of these treatments and persistent obstruction beyond 1 year of age warrants office probing[8], hospital based probing[9] or balloon catheter dilation[10,11] as a first-line interventional therapy. However, the timing for initial probing has been a matter of controversy. Different authors have reported that success rate of probing negatively correlates with advancing age[12], while others revealed that age does not affect the results[13,14].

This study was performed to determine the correlation between age and the cure rate of probing in children with NLDO. One hundred, twenty patients were chosen and divided into three groups based on their age, after failure of conservative management probing was performed in all patients. Additionally statistical analyses were conducted to examine the relationship between age and treatment success rate.

Table 1 The causes of probing failure and their frequency *n*(%)

Rate	Causes					
	Hasner valve obstruction	Canaliculitis	Dacryocystitis	Bony NLD	Mucocele	Total
Frequency	96(80)	5(4.2)	10(8.3)	1(0.9)	8(6.7)	120
Failure	10(58.9)	3(17.6)	3(17.6)	1(5.1)	0	17

SUBJECTS AND METHODS

Subjects A prospective study was conducted between February 2009 and October 2010 enrolling 120 patients with NLDO. The inclusion criteria were as: 1) confirmed diagnosis of NLDO; 2) no prior interventions (*i. e.* probing); 3) absence of other nasolacrimal malformations or disorders and 4) age younger than five years.

NLDO was diagnosed based on the clinical assessment of: epiphora from the first weeks of life, wattery eye, mucopurulentor purulent discharge and occasionally regurgitation of mucus by applying pressure over the lacrimal sac.

Interventions All patients that underwent conservative management but resolution of the symptoms was not achieved, Probing was done under general anesthesia. Probing was carried out by dilating the upper punctum, then a 00(0.90mm) Bowman's probe was inserted into the canaliculus. It was passed till the hard feel of the medial wall of the lacrimal fossa was felt. At this time the probe was turned to the nasolacrimal duct (NLD) and gently progressed until the resistance of obstruction was felt. Firm pressure was applied to the probe in order to break down the obstruction. As an assessment strategy irrigation was done from the upper punctum by 5mL normal saline with 40mg gentamycin that drained from the nasopharynx by a pediatric-sized suction catheter.

The treatment was considered successful if at the three months follow up, the patient was free of all epiphora signs and symptoms.

Statistical Analysis Statistical analyses were done by using SPSS software package version 17.0 for windows (SPSS Inc. Chicago, IL, USA). Association between categorical variables was investigated by chi square test for contingency tables. Fisher exact test was used instead wherever necessary. In all instances, *P* value less than 0.05 was considered statistically significant.

RESULTS

A total of 120 cases who underwent NLD probing met the study criteria; 80 cases (66.7%) had unilateral while 40 cases (33.3%) had bilateral involvement (160 total obstructed NLDOs). Male constituted 48.3% ($n=58$) and female 51.7% of the patients. The mean age of the study participants was (17.24±12.19) months (ranging from one month to 60 months).

Patients were divided into three age categories including; group 1<12 months old,53 cases (44.2%), group 2 >13 to <24 months, 48 cases (40.0%) and group 3 age of 25 to 60 months, 19 cases (15.8%). The common cause of probing was congenital NLDO at the Hasner valve ($n=96$), mucocele in eight (6.7%) patients, canaliculitis in five (4.2%), bony NLD in one (0.9%) patient and dacryocystitis in 10 cases (8.3%) that underwent probing.

Table 2 Success rate frequency based on age groups using Chi-square test *n*(%)

Rate	Age		
	1-12mo	13-24mo	25-60mo
Success	50(94.3)	40(83.3)	13(68.4)
Failure	3(5.7)	8(16.7)	6(31.6)

Of the 120 patients, obstruction in 103 patients (85.8%) was resolved after first probing attempt.

The causes of probing and first probing failures are presented in Table 1.

There was no significant correlation between site of obstruction with age, gender or treatment results ($P=0.351$, $P=0.238$ and $P=0.934$, respectively). Also there was no significant correlation between gender and success rate of probing ($P=0.682$).

The success rate in group 1 was 94.3%, while in group 2 was 83.3% and in group 3 was 68.4% (Table 2). Statistical analyses showed significant differences in success rate of these groups ($P=0.017$). Each group's success rate was compared with the other two groups'; there was no significant difference in success rate between the groups 1 and 2 ($P=0.076$) or the groups 2 and 3 ($P=0.176$). But the success rate in group 1 was statistically significant difference from the 3rd group's ($P=0.003$).

DISCUSSION

One hundredand twenty patients with NLDO who underwent probing were studied to demonstrate the role of operation age in success rate of the treatment. With three month follow up the patients were assessed clinically to reveal success rate. Initial signs and symptoms Resolution was considered as obstruction remission.

The correlation between age and probing success rate investigated previously, but the results have been inconsistent. Baker[15] reported a high success rate of probing in children with NLDO who were younger than 14 months at the time of the procedure. He probed 860 eyes with NLDO and only in 6% of the treated eyes a second probing was required.

Katowitz and Welsh[16] studied 427 patients with congenital NLDO involving 572 eyes. After failure of conservative treatment patients underwent probing. They compared the success rate of probing in patients with different ages at the time of the procedure. Based on their observation they suggested that probing should be performed prior to 13 months of age to obtain higher success rate.

Mannor *et al*[17] reported the same results, success of NLD probing was negatively correlated with aging. They studied 142 infants with NLDO who underwent probing.

In against to mentioned studies, some have pointed out that age doesnot necessarily influence the chance of having a successful probing. For instance, Zwaan J[18] reviewed the records of 120 patients who underwent probing, and compared cure rate of patients. He concluded that probing beyond the age of one year does not end to decrease in success rate of the treatment. Burtun[19] involved the type of obstruction in his analysis and concluded that probing can be postponed without any decrement in the cure rate, if there is an uncomplicated obstruction at the valve of Hasner. He obtained the cure rate of 100% in children younger than 4 years of age with uncomplicated obstructions. Likewise, Maheshwari[20] performed a retrospective study of 84 children older than 13 months. His study revealed that there is no significant difference in treatment result of children between 13 to 24 months and children older than 24 months. He concluded that there is no correlation between success rate and age. Limitation of our study was the small sample size recruited; Future studies with large enough sample sizes are paramount to elucidate the correlation between success rates of NLDO probing and age.

In conclusion, our observation confirmed that success rate of probing declines with increasing age. Hence early intervention, preferably in the first two years of age is suggested as the standard treatment modality for congenital NLDO.

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