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# Clinical analysis of congenital nasolacrimal duct obstruction treated with a new type of probe

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## Abstract

• AIM: To study the clinical effect of a new type of probe to treat congenital nasolacrimal duct obstruction (NLDO) according to the characteristics of the infant, such as age, head not being easily fixed, tissue tenderness and not suitable for manipulation repeatedly.

• METHODS: All 2568 infants (2771 eyes) who have congenital NLDO received probing of lacrimal passages with the new type probing needle and were observed in the clinic service.

• RESULTS: All eyes could be probed successfully, especially 2722 eyes (98.23%) could be probed successfully one time and 49 eyes (1.77%) were two times. There were not any severe complications but gentle palpebral edema.

• CONCLUSION: New one-time probing needle which are reasonable designed are convenient, safe and practical to use. They have no hurt to lacrimal passage. At the same time, they can be packed and sterilized independently to avoid cross contamination. This new type, low price needle which is particularly suitable for infant has good therapeutic effect and deserves to be spread to use.

• KEYWORDS: congenital nasolacrimal duct obstruction; probing needle; infants

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## INTRODUCTION

Congenital nasolacrimal duct obstruction (NLDO) is a common ocular disorder, affecting up to 20% of newborn infants[1-4]. Nasolacrimal probing and dilation or nasolacrimal intubation are generally curative procedures in most cases. The treatment modality for congenital NLDO is mainly lavaging and probing of lacrimal passages. However, the probes for lavaging and probing of lacrimal passages varies among different doctors[5-8]. It is also more difficult to operate on infants as compared to adults, which has potential risk during the procedure. Treatment for congenital NLDO in infants has its own characteristics, such as inadequate cooperation, the head often swing, the probe being difficult to fix, the tissue being tender and repeated procedures through lacrimal passages are not appropriate. We have designed a new type of probe for infants, which was used in 2568 cases of neonatorum dacryocystitis and has been confirmed its safety, non-invasive nature, easy operation, sanitation, economic and good therapeutic outcomes. This kind of probe has obtained national certificate for new practical patent in April 2007 (Patent No: ZL200620013479. 3). In this study, we reported our experience of treating congenital NLDO by it.

## MATERIALS AND METHODS

**Materials** This study included 2568 infants (2771 eyes) with congenital NLDO who were treated by lacrimal probing in the outpatient of Department of Ophthalmology in our hospital between January 2006 and June 2011. Bilateral involvement was noted in 203 cases and unilateral in 2365 cases. Age at presentation ranged from 15 days to 24 months, average 2. 1 months. Age of onset varied between 2 and 10 days after birth, average 5 days. The clinical features included epiphora and/or much pyorrhea discharge. All infants were initially treated with antibiotics eye drops, massage of dacryocyst and lacrimal irrigation, but no apparent improvement of symptoms was found.

**Methods** This new type of probe is similar to that of intravenous infusion needle, with tip blunt and flat. The probe is 35mm in length and 0. 5mm in caliber (The caliber can be varied according to different age groups), and the handle is connected with a 20cm-long plastic extension tube. The probe was independently packaged and used for only once.

Topical anesthesia with proxymetacaine was applied thrice on the affected eyes 15 minutes before operation. After dilatation of the upper punctum, the probe was introduced vertically into the punctum and ampulla and then rotated horizontally 90 degrees in the same plane to enter the canaliculus. With lateral tension placed on the lid to prevent kinking of the canaliculus, the probe was then advanced until it touched

bony firmness, indicating that it had reached the nasal wall of the lacrimal sac. During the process, the prolonged tube of the probe was linked to a 5mL syringe and the water was infused slowly. The probe was left in place for about one hour and then removed. The parents were asked for further consultation next day to perform irrigation of the lacrimal passage in order to strength the therapeutic effect.

**RESULTS**

The success of treatment was defined as no epiphora or pyorrhea 1 week after treatment. We consider the treatment as failure when there are still epiphora and pyorrhea and obstructed lacrimal passage. In such cases, a second probing was performed.

All 2771 eyes of 2568 infants were successfully treated after one or twice probing. The success rate of cure was 100%. Among them, 2722 eyes (98.23%) were successfully treated in the first time. The remaining 49 eyes (1.77%) were successfully cured in the second time. There were no cases of severe complications such as postoperative bleeding or infection. Only very few infants had mild palpebral edema.

**DISCUSSION**

The traditional choice of management is probing and irrigation. However, the probes for lavaging and probing of lacrimal passages varies among different hospitals[5-8]. The treatment outcomes vary among these different doctors because of its safety and convenience. The clinical application of our probe needle demonstrates fair results and has the following characteristics.

There is a prolonged tube of the probe, so it is easier and safer to perform as compared with common probing needle. These findings may suggest that such new probe can be effectively and safely used in an outpatient setting, and it may eliminate the need for more invasive techniques and avoid general anesthesia. We believe that the application of the new type of probe enabled the procedure to be more easily and prevent tissue damage. Through applying the new type of probe needle, we can expand the lacrimal duct after the procedure. It is easy to put antibiotics into the duct in order to reduce the swelling and prevent recurrence of obstruction. Another advantage is that the caliber can be varied according to different age groups.

In our study we select the upper punctum to probe, because it is superior to be exposed and is suitable for infants to perfrom. Although the passage of the upper punctum is to inner upward, the probe was introduced vertically into the punctum and ampulla and then rotated horizontally 90 degrees in the same plane to enter the canaliculus in order to prevent from damaging the punctum or ampulla. The success rate in this study was found to be higher than the rate reported in some previous studies[9-16]. The recurrence of obstruction is very rare in our study. If there are still epiphora and pyorrhea and obstructed lacrimal passage, the inflammatory adhesion may occur. Repeat irrigation two or three times will be advised. If there are still epiphora and pyorrhea and obstructed lacrimal passage, a second probing is performed.

As far as the timing of probing, some doctors suggest irrigation and probing after 3 months, and others think the obstructions could have resolved spontaneously in most cases after 2 years old. But through our clinical observation, lacimal duct irrigation can be performed as early as 1 month, and probing can be performed as early as 2 to 3 months. Because the function of nasolacrimal duct and respiratory system is basically mature, there is little chance to damage the nasolacrimal duct and no infants have coughing and asphyxia during the procedure. There were no cases of severe complications such as postoperative bleeding or infection. Only very few infants had mild palpebral edema. The younger the patients are, the thinner the obstructing membrane is, so the less painful the infants feel and have little bad psychological influence for fearing the disease. Although some of the obstructions could have resolved spontaneously during 1 or 2 years old, but membrane obstruction occur in most cases, digital massage and irrigation could not rupture the obstruction membrane. The patients and the parents are often not tolerant with repeat irrigation and are often worrying about the disease. Moreover, the frequent mucopurulent discharge may lead to discomfort and frequent rubbing the eye, which can result in conjunctivitis, even acute dacryocystitis and keratitis and other potential danger. To the skilled doctor, the procedure is easy and rapid to perform, the treatment effect is obvious. Therefore, we believer the earlier probing is better than later probing. Generally, nasolacrimal duct probing can be performed as early as 2 months.

In conclusion, the design of new type of probing needle is reasonable, and convenient to use. It has no damage to lacrimal duct. Its independent packing and single using can prevent cross-infection. It is an effective and economic procedure especially for infants, and deserves to be spread to use.

**REFERENCES**

1 Robb RM. Congenital nasolacrimal duct obstruction. *Ophthalmol Clin North Am* 2001;14(3):443-446

2 Marr JE, Drake Lee A. Willshaw HE. Management of childhood epiphora. *Br J Ophthalmol* 2005;89(9):1123-1126

3 Cha DS, Lee H, Park MS, Lee JM, Baek SH. Clinical outcomes of initial and repeated nasolacrimal duct office-based probing for congenital nasolacrimal duct obstruction. *Korean J Ophthalmol* 2010;24(5):261-266

4 Tan AD, Rubin PA, Sutula FC. Congenital nasolacrimal duct obstruction. *Int Ophthalmol Clin* 2001;41(4):57-69

5 Casady DR, Meyer DR, Simon JW. Stepwise treatment paradigm for congenital nasolacrimal duct obstruction. *Ophthal Plast Reconstr Surg* 2006;22(4):243-247

6 Ciftci F, Akman A, Sonmez M. Systematic, combined treatment approach

to nasolacrimal duct obstruction in different age groups. *Eur J Ophthalmol* 2000;10(4):324-329

7 Cakmak SS, Yildirim M, Sakalar YB, Keklikci U, Alakus F. Is it necessary to accompany probing with endoscopy in cases of congenital nasolacrimal canal obstruction? *Int J Pediatr Otorhinolaryngol* 2010;74(9):1013-1015

8 Olitsky S, Medow N, Rogers G. Diagnosis and treatment of congenital nasolacrimal duct obstruction. *J Pediatr Ophthalmol Strabismus* 2007;44(2):80-83

9 Wagner RS. The management of congenital nasolacrimal duct obstruction: an international perspective. *J Pediatr Ophthalmol Strabismus* 2010;47(2):75

10 Honavar SG, Prakash VE, Rao GN. Outcome of probing for congenital nasolacrimal duct obstruction in older children. *Am J Ophthalmol* 2000;130(1):42-48

11 Kashkouli MB, Beigi B, Parvaresh MM. Late and very late initial probing for congenital nasolacrimal duct obstruction: what is the cause of failure? *Br J Ophthalmol* 2003;87(9):1151-1153

12 Singh Bhinder G, Singh Bhinder H. Repeated probing results in the treatment of congenital nasolacrimal duct obstruction. *Eur J Ophthalmol* 2004;14(3):185-192

13 Maheshwari R. Results of probing for congenital nasolacrimal duct obstruction in children older than 13 months of age. *Indian J Ophthalmol* 2005;53(1):49-51

14 Maheshwari R. Success rate and cause of failure for late probing for congenital nasolacrimal duct obstruction. *J Pediatr Ophthalmol Strabismus* 2008;45(3):168-171

15 Takahashi Y, Kakizaki H, Chan WO, Selva D. Management of congenital nasolacrimal duct obstruction. *Acta Ophthalmol* 2010;88(5):506-513

16 Repka MX, Chandler DL, Beck RW. Primary treatment of nasolacrimal duct obstruction with probing in children younger than 4 years. *Ophthalmology* 2008;115(3):577-584.e3

## 新型泪道探通针治疗先天性泪道阻塞临床分析

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**摘要**

**目的**:根据患儿年幼、头部易摆动、针头难固定易滑脱、组织娇嫩、不宜探针反复进出泪道操作等特点,探讨新型泪道探通针治疗婴幼儿先天性泪道阻塞(nasolacrimal duct obstruction,NLDO)的临床疗效。

**方法**:用新型泪道探通针对眼科门诊2568例2771眼先天性NLDO患者进行泪道探通,并观察疗效。

**结果**:所有患者手术成功,其中一次探通成功2722眼(98.23%),二次探通成功49眼(1.77%),除极少数患儿有轻度眼睑水肿外,无任何严重并发症发生。

**结论**:新型泪道探通针设计合理、操作方便、安全实用,对泪道无损伤、独立包装、消毒彻底、能避免交叉感染、价格低廉、临床应用效果良好,尤其适合婴幼儿患者,值得推广使用。

**关键词**:先天性泪道阻塞;泪道探通针;婴幼儿