·Clinical Research·

Efficacy of probing in the treatment of congenital nasolacrimal duct obstruction in three age groups

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Abstract

• AIM: To compare the success rates of probing for the treatment of congenital nasolacrimal duct obstruction in children divided into three age groups.

• METHODS: One hundred and eighty children with uncomplicated congenital nasolacrimal duct obstruction underwent probing in Eye Hospital of Liaquat University of Medical and Health Sciences Hyderabad, Sindh, Pakistan from March 2005 to January 2008. The children were divided into three groups: Group I (aged 4-6 months), Group II (aged 7-12 months) and Group III (aged 13-24 months). Success was defined as complete resolution of signs and symptoms. The chi-square test was used to analyze the results.

• RESULTS: The success rate was 100.0% in Group I, 88.5% in Group II and 82.3% in Group III. The overall cure rate for the entire study was 90.7%.

• CONCLUSION: The efficacy of probing decreases with the increasing age. However, when probing is done within six months of age, it is highly effective and results in complete resolution of symptoms.

• KEYWORDS: nasolacrimal duct obstruction; probing; children

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INTRODUCTION

Congenital nasolacrimal duct obstruction is the most common abnormality of the lacrimal system in children affecting upto 20% of new borns[1], but only 1% to 6% of these children become symptomatic [2]. In Pakistan 30% of bilateral cases were found in a study conducted on 150 patients[3].

Dacryostenosis or atresia of the nasolacrimal duct is the most common cause of epiphora in paediatric population resulting from the failure of the canalization of nasolacrimal duct [4]. The commonest cause of congenital nasolacrimal duct obstruction at birth is a membranous obstruction at the distal end of the nasolacrimal duct and spontaneous resolution occurs in 95% cases during the first year of life and in 60% of remainder cases during the following year [5]. The characteristic presentation is persistent watering (epiphora) and mucopurulent discharge from the first month of life along with conjunctival hyperemia and crusting of eyelid margins[6].

Dacryostenosis should be managed conservatively whenever possible. Standard management in first few months of life includes hydrostatic massage of the lacrimal sac and topical antibiotics [7]. Probing is time proven treatment of congenital duct obstruction which includes office probing with topical anesthesia at 4-6 months and probing under general anesthesia at 12 months [8]. False passage formation, traumatic stenosis and unexplained f ailure are recognized problems of this procedure. However, the timing for initial probing has been a matter of controversy [9-11]. Advocates of early probing suggest that early correction avoids morbidity due to epiphora and chronic dacryocystitis and the postponement of the procedure may result in success decrease with simple probing due to chronic inflammation and fibrosis. While the advocates of late probing are of the view that spontaneous resolution of the obstruction negates the need for probing in the first place [2]. Successful outcome is defined as absence of tearing and discharge in affected eye[12].

The purpose of carrying out this study is to determine the optimal age for the successful probing of a child suf-

fering from congenital nasolacrimal duct obstruction as there is controversy regarding the timing of probing and its outcome.

MATERIALS AND METHODS

This study was conducted from March 2005 to January 2008 at the Department of Ophthalmology Liaquat University of Medical and Health Sciences Eye Hospital Hyderabad. Children/patients coming to the Eye unit I Outpatient Depatrment (OPD) with uncomplicated congenital nasolacrimal duct obstruction were enrolled in the study. The initial examination included assessment of the lacrimal puncta, anomalies of the eyelids and face, exclusion of the conjunctivitis, allergic inflammation and other causes of epiphora in children. The diagnosis of congenital nasolacrimal duct obstruction was made on the basis of history of tearing with or without mucopurulent discharge since birth and on clinical examination as evidenced by epiphora beginning during the first few weeks of life, recurrent mucopurulent discharge and positive regurgitation test. Patients having prior history of one or more probings were excluded from the study. The eligible patients were registered and divided into three groups: Group I (aged 4-6 months), Group II (aged 7-12 months) and Group III (aged 13-24 months) respectively. All the children in the three groups were put on conservative treatment in the form of topical antibiotic drops four times daily for two days prior to the surgical intervention. The surgical procedure was carried out in the general anaesthesia. Informed consent was taken. The instruments used were punctum dilator, Bowman's probe (0-1 size), saline filled syringe, fluorescein dye 20g/L and cannula. Bowman's probe size 00 (0.9mm diameter) was used in all cases. After dilating the upper punctum the Bowman's probe was introduced into the upper canaliculus until the medial wall of the lacrimal fossa was felt, at which point it was turned and introduced into the nasolacrimal duct and advanced till resistance was felt. The breaking of the membrane was felt as the probe overcame the obstruction. The head of the patient was turned to the same side and normal saline stained with fluorescein dye 20g/L was injected through the lower canaliculus with a syringe and cannula. Patency was confirmed by retrieval of saline from the patient's throat. Each patient was given antibiotic drops four times per day for three weeks. At first, the patient was called after one week and then followed up at the 2nd and 3rd month to observe the outcome of the procedure. Success of the probing was defined as the complete remission of the sign and symptoms at one week after procedure.

RESULTS

This quasi-experimental study was conducted on 214 eyes of 180 patients. Of these, 110 patients were male (61.1%) and 70 female (38.9%). The patients were divided into three groups according to the age at which probing was performed. The mean age of Group I (4-12 months) was 5.08 months, Group II (7-12 months) 9.1 months and Group III (13-24 months) 18.7 months respectively.

In Group I (60 cases) 44 cases are unilateral and 16 cases are bilateral. In Group II (60 cases) 50 cases are unilateral and 10 cases are bilateral. In Group III (60 cases) 52 cases are unilateral and 8 cases are bilateral.

In Group I, the success rate was 100.0%. Group II showed the success rate of 88.5% while Group III had a success rate of 82.3%. The cure rate for the entire study was 90.7%(Table 1).

None of the patients had any surgery or anesthesia related complications.

Two types of obstruction were encountered during probing-simple and complex. In simple obstruction, the resistance could be easily bypassed with the help of Bowman's probe and post-probing syringing revealed a patent lacrimal system. However, in complex obstruction the probe could not be passed and there was firm resistance to its passage. Post-probing syringing was not patent in any of these patients.

Statistical Analysis It was found that at 5% level of significance the chi-square result was 13.72 with tabulated value of 5.991. It showed that the null hypothesis is rejected and the age groups and success rates and failure of the operation are not independent. Significance is also confirmed by the *P* value of 0.001.

We also found that at 5% level of significance the chi-square result was 6.21 with tabulated value of 5.991. It showed that the null hypothesis is rejected and the age groups and laterality are not independent. Significance is also confirmed by the *P* value of 0.0449.

DISCUSSION

Congenital nasolacrimal duct obstruction may occur in as many as 20%-30% of new borns [13-15]. However, only

1%-6% of these children become symptomatic [13,14]. It is well documented that the commonest cause of congenital nasolacrimal obstruction at birth is a membranous obstruction at the distal end of nasolacrimal duct[16-19]. Probing of the nasolacrimal duct is a standard therapeutic procedure in the management of the congenital nasolacrimal duct obstruction. Traditional options include office probing with topical anesthesia at the age of 4-6 months or observation and medical management followed by probing under general anesthesia at approximately 12 months[12]. This study was conducted to ascertain the optimal age of probing in congenital nasolacrimal duct obstruction.

A total of 214 eyes of 180 patients aged 4-24 months of age were included in the study. There was bilateral affection in 18.9% of the cases. Of these, 110 (61.1%) were males and 70 (38.9%) females. Hence, the number of males was almost double that of females. Kashkouli *et al*[7] reported 52.4% males and 47.6% females and 36.6% bilateral cases. In Halepota's study [3] the bilateral cases were 30%.

In this study, 194 out of 214 eyes (90.7%) were cured (Table 1). Halepota *et al* [3] reported a success rate of 95% and in Yap's study [20] the cure rate was 90%. Havins and Wilkins [21] demonstrated a success rate of 94% for probing done in children aged less than 8 months compared to 56% in children aged 18 months and older. Sturrock *et al* [22] reported 86% success when probing under one year compared to 72% between 1 and 2 years of age and 42% for more than 2 years of age. Casady *et al* [23] reported a success rate of 85% for probing in children more than 18 months of age.

Mannor *et al* [24] have also reported success rates of 92% in children aged 12 months and 89% in 24 months old.

In a comparative study of simple probing, simple syringing and combined probing and syringing of congenital nasolacrimal duct obstruction, the results were 91%, 64% and 96% in three respective groups [25]. The success rate of our study is comparable to the results of the third group.

One question that has confounded ophthalmologists is whether late probing affects the outcome of the procedure. Many ophthalmologists believe that the success rate decreases as the age increases. In one study, the success of nasolacrimal duct probing was negatively correlated with the increasing age. The results were 90%, 89%, 80%, 71% and 42% at ages of 12, 24, 36 and 48 months respectively[24].

Young *et al* [26]. achieved an overall success rate of 74%. Honavar *et al*[27]. reported the cure rate of 80%. There are also various studies which indicate that the cure rate does not vary significantly at intervals of increasing age [28]. The cure rates in our study compared well with those reported by Stager *et al*[29] for office probings in the first 12 months of life (92.4%), Katowitz and Welsh[10] for probings done during the first 13 months of life (95.9%) and Kassoff and Meyer[30], who also had good results with early probings. El Mansoury and colleagues [9] had a success rate of 93.5% in children over the ages of 13 months.

In our study, all the sixty patients of Group I had successful probing. In Group II, 62 out of 70 eyes were cured and in Group III 56 of 68 eyes remained asymptomatic (Table 1). These results are comparable to those found in literature. The success rate declines with the increasing age, but not significantly.

As observed by Robb [12], a simple probing for any untreated obstruction in a patient upto five years of age and occasionally beyond that is a reasonable first procedure. In this study favorable results were achieved in all the three age groups, but probing was found to be most successful when done before or upto the age of 6 months.

In conclusion, from this study it is concluded that the results of probing in different age groups declined as the patients age increased. The best result (100.0%) was achieved in those children who underwent the procedure before the age of six months. The procedure was carried out in general anesthesia which made the probing easy and safe in terms of few trauma and complications.

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