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Repeat probing for treatment of persistent nasolacrimal duct obstruction

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Abstract

Repeat probing of the nasolacrimal duct is one treatment option for children with persistent symptoms of nasolacrimal duct obstruction (NLDO) following an initial probing. We conducted a prospective, multicenter study in which 20 subjects age 6 to <48 months underwent a repeat probing for symptomatic NLDO and had follow-up visits one month and six months after surgery. Treatment success was defined as the absence of all three clinical signs of nasolacrimal duct obstruction—epiphora, increased tear lake, and mucous discharge. Repeat probing was successful in 56% (95% CI, 33%-76%) of cases.

Introduction

Nasolacrimal duct probing in infancy and early childhood is a successful treatment of congenital nasolacrimal duct obstruction (NLDO).¹⁻³ Nevertheless, in about 20% of cases there are persistent symptoms of NLDO following probing.¹ For some of these children, the symptoms are sufficient to warrant a second surgery. Currently, the surgeon may choose between repeat probing, nasolacrimal intubation, balloon catheter dilation, and dacryocystorhinostomy.⁴

We recently completed a prospective, multicenter nonrandomized study of the treatment of persistent congenital NLDO following a single probing. The choice of treatment was determined by the clinician. We have reported outcomes for the children who received either nasolacrimal intubation or balloon catheter dilation in a separate manuscript;⁵ herein we report the outcomes for the children who received repeat probing.

Methods

This study, supported through a cooperative agreement with the National Eye Institute of the National Institutes of Health, was conducted by the Pediatric Eye Disease Investigator Group (PEDIG) at 9 clinical sites. Written informed consent was obtained from the parents of each participant. The complete protocol is available at <http://public.pedig.jaeb.org>. The major aspects are summarized below.

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A listing of the Writing Committee appears at the end of this article. The members of the Pediatric Eye Disease Investigator Group are listed in e-Supplement 1, available at jaapos.org.

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The study enrolled children 6 to <48 months of age who had persistent NLDO after a failed probing. Other major eligibility criteria included onset of NLDO symptoms prior to 6 months chronological age; presence of at least one sign of NLDO (epiphora, increased tear lake, and/or mucopurulent discharge in the absence of an upper respiratory infection or ocular surface irritation); previous failed single primary probing procedure for NLDO; no history of nasolacrimal intubation, balloon catheter dilation, more than one probing, or dacryocystorhinostomy; and absence of Down syndrome.

The repeat probing surgery consisted of the dilation of at least one lacrimal punctum and the passage of a nasolacrimal probe into the nasopharynx at least once. Probe size was at investigator discretion. Procedures were performed under general anesthesia in a facility (ie, a hospital outpatient surgical department or ambulatory surgical center), or in the office without anesthesia at the preference of the investigator. Patency was confirmed in all cases by touching the probe in the nasopharynx with a second probe, by visualization of the probe beneath the inferior turbinate, or by recovery of fluorescein-colored saline from the nasopharynx after irrigation through the nasolacrimal system.

Subjects had follow-up visits timed 1 month (± 1 week) and 6 months (± 1 month) after surgery. At both visits, a trained and certified examiner other than the operating surgeon evaluated the presence or absence of each of three clinical signs of NLDO (epiphora, increased tear lake, and mucous discharge). In addition, a dye disappearance test (DDT) without topical anesthesia was performed by a certified examiner according to a protocol previously described.¹

The primary outcome was treatment success or failure six months after surgery based on an assessment of clinical signs. Success was defined as the absence of all three clinical signs: epiphora, increased tear lake, and mucous discharge. Eyes that underwent another procedure prior to a given visit were considered treatment failures for that visit. The proportion of eyes with 6-month treatment success and a 95% confidence interval were computed by logistic regression using generalized estimating equations to adjust both the point estimate and the confidence interval for the correlation between eyes of subjects who had procedures on both eyes.⁶ Analyses were conducted using SAS version 9.1 (SAS Institute Inc. Cary, NC).

Results

Twenty subjects (23 eyes) at 9 clinical sites underwent a repeat probing as their second surgery for NLDO. Eleven (55%) subjects had repeat probing performed in the office setting prior to 12 months of age, and 9 subjects (45%) had probing performed in a hospital or ambulatory surgery center, all but one over 12 months of age. The subjects' mean age at surgery was 16 ± 8 months (range, 7 to 35 months), with 12 (60%) subjects between 6 to <12 months old, 5 (25%) between 12 and 24 months, and 3 (15%) between 24 and <36 months. Ten subjects (50%) were female and 16 (80%) were white. Three subjects underwent repeat probing in both eyes. The surgery included inferior turbinate infraction in 4 subjects (20%) operated in the surgical facility. No surgical complications were reported for any of the subjects.

For the 19 (95%) subjects completing the one-month postoperative visit, success was reported in 11 of 22 eyes (53% [95% CI, 31%-73%]). For the 18 (90%) subjects completing the 6-month postoperative visit, success was reported in 11 of 21 eyes (56% [95% CI, 33%-76%]). Two eyes were considered failures at 6 months due to prior reoperation. At 6 months the DDT result was normal in 15 (72%) eyes, indeterminate in 1 (5%), and abnormal in 5 (22%).

Discussion

The optimal surgical procedure for NLDO that persists after an initial probing procedure has not been determined. In this study, we evaluated repeat probing and found a 6-month success

rate of 56%. The outcome was more often successful when assessed with the DDT (72%). This could be true because the DDT did not detect milder or partial obstructions. In addition the DDT assessment was unmasked.

Our finding of success in just over half of eyes with repeat probing is similar to several retrospective case series. Stager reported success with a second probing in 102 of 186 eyes (55%).² Katowitz and colleagues reported success with repeat probing in 52% (13 of 25) of children aged 6-18 months and in 18% (3 of 17) in children aged 18-24 months.³

Our study utilized prospective data collection with investigator certification and outcome assessment at a uniform time interval. However, the study has several limitations. Our results may be subject to selection bias because choice of procedure (repeat probing, NLD intubation, or balloon catheter dilation) was at the discretion of the surgeon. In addition, because of the small sample size, the confidence interval on our estimate of success rate was wide; therefore the estimate should be interpreted with caution. The sample size also precludes evaluating whether factors such as site of surgery or complexity of the obstruction have an impact on outcome. Finally, our outcome definitions of treatment success differ from those used by other authors, making direct comparison with results of other authors difficult.

Our findings, taken with prior reports, suggest that repeat probing is a successful treatment for persistent NLDO after a failed probing about half the time.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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