

Outcome of probing under topical anesthesia in children below 18 months of age with congenital nasolacrimal duct obstruction

J Shrestha, S Bajimaya, A Hennig, K Shankar

Citation

J Shrestha, S Bajimaya, A Hennig, K Shankar. *Outcome of probing under topical anesthesia in children below 18 months of age with congenital nasolacrimal duct obstruction*. The Internet Journal of Ophthalmology and Visual Science. 2008 Volume 7 Number 1.

Abstract

Introduction: study of Outcome of probing under topical anesthesia in children below 18 months of age with congenital nasolacrimal duct obstruction (CNLDO). **Methods:** This was a hospital based prospective interventional study including 106 children below 18 months of age who were clinically diagnosed as CNLDO. Under topical anaesthesia, probing was done from lower punctum followed by irrigating the drainage passage with 1-2 ml of normal saline. Patients were followed up for 3 weeks. Second probing was done in case of failure of first probing. **Results:** The mean age of children was 7.67 months. Overall (91.5%) children had improvement on first attempt of probing and syringing. The second probing was conducted out in non-improved subjects at first probing (9 eyes). Overall 3 cases did not improve even after second probing. **Conclusions:** probing in children can be recommended as an initial treatment procedure because of its relatively good outcome and high parents' satisfaction.

INTRODUCTION

Congenital nasolacrimal duct obstruction (CNLDO) is among the most commonly encountered congenital anomaly in pediatric age group, presenting in up to 30% of newborn infants.^{1,23} However such an obstruction is clinically evident in only 2-6% of full term infants. CNLDO is one of the common causes of childhood epiphora. It is usually caused by a membranous block at the valve of Hasner at nasal end of nasolacrimal duct. The obstruction is most frequently due to incomplete canalization with persistence of the fibrous layer of the nasal mucoperiosteum.⁴⁵ Abnormalities in the normal embryological development of lacrimal system may be responsible for the clinical disease. Welham and Hughes found craniofacial defects in 6% of 142 children who had to undergo lacrimal surgery.⁶

Most obstructions open spontaneously within 4-6 weeks after birth. Published series have shown clearing of disease in 50-90% of children during the first six months of life.³⁴ Conservative management of the newborn with topical antibiotics and properly performed Crigglers massage of the nasolacrimal sac is appropriate treatment during the first six months of age as there is spontaneous opening of the lower end of the nasolacrimal duct.

The timing of when to proceed probing has long been a controversial topic. Those in favor of early probing argue that it negates the need for general anesthesia and that it provides a rapid improvement in symptoms meaning by neither the child nor the parents are required to put up with the inconvenience of persistent epiphora, discharge and recurrent infections.⁷ This has not been studied in a controlled manner during the first year of life, although studies of probing up to six months of age indicate a success rate of 79-98%³⁵⁸ as compared with a natural resolution rate of 76-100%.⁵⁹¹⁰ A further argument in favor of early probing is that, the rate of successful probing falls with increasing age of the child. It has been shown that the earlier the probing is performed, the greater the success rate.⁸ Persistent obstruction of the drainage apparatus is thought to lead to scarring due to recurrent inflammation and infection, which leads to persistent lacrimal symptoms in older children.¹¹¹² Although other works have identified either no difference in success rate of probing at different age⁵¹³¹⁴¹⁵ or that the higher failure rate in older children is probably unrelated to the age of the child and due rather, to a process of natural selection.⁵⁷¹⁶¹⁷ As children grow older, more complex and severe obstructions become increasingly common as cases of simple membranous obstructions resolve. This in turn

reduces the success rate of probing in older children compared with their younger counterparts. Some studies have demonstrated that the success of probing is determined more by the nature of the obstruction than by the age of the patient on endoscopically viewing the distal end of the nasolacrimal duct.^{7,18}

Several publications have been made regarding management of this condition. Proponents of early probing state that it can be performed in an office setting with a high degree of resolution and parents' satisfaction, where as advocates of later probing report a high degree of spontaneous resolution, thereby obviating the need for surgical manipulation. There has been no previous report on outcome of probing for congenital nasolacrimal duct obstruction from Nepal. This study was aimed to evaluate the outcome of probing and syringing under topical anesthesia in children below 18 months of age with congenital nasolacrimal duct obstruction and to correlate the time of probing with age of children.

SUBJECTS AND METHODS

This was a hospital based prospective interventional study carried out at Sagarmatha Chaudhary Eye Hospital from November 2006 to February 2007. The study included 106 children below 18 months of age who had attended pediatric eye out patient department at this hospital. Children above 18 months of age or child with history of birth trauma or congenital adnexal anomalies were excluded from the study. Diagnosis of CNLDO was based on history of watering from eye since birth or during first few weeks of life with discharge and on clinical examination as evidence of regurgitation of fluid from the punctum on pressure over sac area. An informed written consent was taken from the parents of the children before carrying out the procedure. The Children were divided in 3 groups according to child's age; Group A (≤ 6 months), Group B (7-12 months) and Group C (13- 18 months). Materials that were required for the procedure were Nettlehips punctum dilator, Sets of Bowman's lacrimal probe (No. 000) and lacrimal irrigation cannula with 5 ml glass syringe. 4% xylocaine was used as topical anesthetics, one drop instilled twice in the said eye 5 minutes prior to the procedure. In all cases probing was done from the lower punctum followed by irrigating the drainage passage with 1-2 ml of normal saline and observing the child for swallowing of fluid. Mother was advised to continue digital massage and instillation of combination of topical Chloramphenicol and Dexamethasone eye drops four times daily for 2 weeks. Patients were followed up after 3 weeks.

A second probing was done in case of failure of first probing. Again the children were followed up at 2 to 4 weeks duration. Relief of symptoms and signs confirmed the success of probing and syringing.

RESULTS

Out of 106 children (male 60%; female 40%), 11 children (10.4%) had bilateral, 54 (50.9%) had right sided and 41 (39.6%) had left sided involvements. The age of children ranges from 4 to 18 months (Mean 7.67, SD 4.37). 106 babies (117 eyes) were categorized into three groups as group A (≤ 6 months), group B (7-12 months) and group C (13-18months). There were 40 babies (45 eyes) in Group A, 35 (41 eyes) in Group B and 31 (31 eyes) in Group C (Table-1). Over all, 97 (91.5%) children had improvement on first attempt of probing and syringing. 89 (93.7%) unilateral cases and 8 (72.7%) in bilateral cases had improvement after first probing. The second time probing was conducted out in non-improved subjects at first time probing (9 eyes). Overall 3 cases did not improve even after second probing.

Figure 1

Table 1: Outcome of probing and syringing in children according to age group

	Group A (≤ 6 months)			Group B (7-12 months)			Group C (13-18 months)		
	BE	RE	LE	BE	RE	LE	BE	RE	LE
Laterality of CNLDO									
No. of Children	5	20	15	6	18	11	0	16	15
No. of eyes for 1 st probing	10	20	15	12	18	11	0	16	15
Outcome after 1st probing and syringing									
Success	9	20	14	10	18	10	0	14	13
Failure	1	0	1	2	0	1	0	2	2
Second attempt of probing and syringing at 2-3 weeks									
Second attempt	1	-	1	1	-	1	-	2	2
Outcome	Good		Good	Failure		Good		Good	Failure

Success rate (Table-2) was 95.6% (43 eyes) in first probing and 100% (2 eyes) in second probing in-group A (≤ 6 months). Success rate was 92.7% (38 eyes) in first probing and 66.7% (2 eyes) in second probing in-group B (7-12 months). Similarly, Success rate was 87.1% (27 eyes) in first probing and 50% (2 eyes) in second probing in-group C (13-18 months). There was no statistically difference in success rate (Table-2) among the groups for first probing (p=0.39) and second probing (p=0.47) as well. The overall success of probing was 97.4%. The success rate of probing

in each of these groups was not different (p=0.21).

Figure 2

Table 2: The success of probing and syringing

	Group A (≤6 months)	Group B (7-12 months)	Group C (13-18 months)	P*
No. of children	40	35	31	
No. of eyes that underwent probing	45	41	31	0.59
Success after 1 st attempt	43 (95.6%)	38 (92.7%)	27 (87.1%)	0.39
Success after 2 nd attempt	2 (100%)	2 (66.7%)	2 (50%)	0.47
Overall success rate	45 (100%)	40 (97%)	29 (93.5%)	0.21

DISCUSSION

Probing of the nasolacrimal duct is a standard therapeutic procedure in the management of the CNLDO and is highly successful as well. However, controversy exists regarding the optimal timing of probing and its outcome in older children. Honavar et al⁵ and Mannor et al¹⁰ had reports of significant failure of probing with increasing age. They showed significant decrease in success rate of probing for CNLDO with increase in age (Table-3). In contrary, we reported almost similar rate of success (p=0.21) for probing in all age groups with overall success rate of 97.4% (114 eyes). Overall cure rate was 100% in group A, 97% in group B and 93% in group C.

Our result quite corresponded with the report by Robb¹ and Zwaan²⁰. In a study by Robb¹ among 252 children who underwent probing, the cure rate was 88.9% in age group 12-14 months, 96.8% in 15-17 months, 90.7% in 18-23 months, 96.4% in 24-35 months and 92.6% > 36 months (0.31). Cure rate on initial probing was 90%, rising to 96% after a second probing. Cure rate for entire groups were 92.1%. Similarly in a study conducted by Zwaan²⁰ compared the outcome in children <1, 1-2, >2 years, the cure rate were 97%, 88% and 93 % respectively (P= 0.13).

Honavar et al⁵ and Mannor et al¹⁰ observed the outcome especially above 24 months (Table-3) where as we observed the rate of success below 18 months old children. Robb¹ and Zwaan²⁰ quoted in about 12 to 36 months older children. Even though the success rate was almost similar in younger age grouped children in contrast to the report in older age grouped children, it was not a strong predictive variable to

determine success rate. Various authors had speculated on several factors besides age at probing, bilaterality, and severity of epiphora, type of naso-lacrimal duct obstructions,⁵ failed conservative therapy, and anatomic variance of the nasolacrimal duct as possible causes of success or failure of probing. We had 10.4% bilateral involvement. Conservative therapy was not administered. We didn't measure severity of epiphora and type of nasolacrimal duct obstructions. Further study can be warranted in reference to these variables. Although success rate of probing was high for CNLDO ≤18 months, probing before first year of life has shown to be very effective with almost 100% success.

Apart from a progression in the rate of failure, a linear increase in the number of subsequent procedures can be administered if the initial probing failed. We observed 66.7% (6 eyes out of 9 eyes) success in second time probing in failure cases. Honavar et al⁵ and Robb¹ reported encouraging outcome with repeat probing in children who had previously undergone unsuccessful probing. They reported almost 50% success rate in repeat probing. In case of failure in first attempt, repeat probing can be a considerable factor to sum up the success rate.

Hence, probing in children can be recommended as an initial treatment procedure because of its relatively good efficacy and high parents' satisfaction.

ABBREVIATIONS

- CNLDO : Congenital Nasolacrimal Duct Obstruction
- OPD : Outpatient department
- ≤ : Equal to or less than
- ≥ : Equal to or greater than
- < : Less than

ACKNOWLEDGEMENT

We express our gratitude to Paediatric Ophthalmology Unit, Sagarmatha Chaudhary Eye Hospital, Lahan for providing us an opportunity and support to conduct the study. We are thankful to Mr. Gauri Shankar Shrestha, optometrist for helping during script writing and data analysis.

References

1. Robb RM. Success rates of nasolacrimal duct probing at time intervals after 1 year of age. *Ophthalmology* 1998; 105: 1308-10.
2. MacEwen CJ. Young JD. Epiphora during the first year of life. *Eye* 1991; 5: 596-600
3. Cassady JV. Developmental anatomy of the nasolacrimal duct. *Arch Ophthalmol* 1952; 47: 141-58

Outcome of probing under topical anesthesia in children below 18 months of age with congenital nasolacrimal duct obstruction

4. Kushner BJ. Management of nasolacrimal duct obstruction in children between 18 months and 4 years old. *J AAPOS* 1998; 2: 57-60.
5. Honavar S, Vasudha EP, Rao GN. Outcome of probing for congenital nasolacrimal duct obstruction in older children. *Amer J Ophthalmol* 2000; 130: 42-8.
6. Welham RAN, Hughes S. Lacrimal surgery in children. *Amer J Ophthalmol* 1985; 99: 27-34
7. MacEwen CJ, Young JDH, Barras CW, Ram B, White P. Value of nasal endoscopy and probing in the diagnosis and management of children with congenital epiphora. *Brit J Ophthalmol* 2001; 85: 314-8
8. Paul TO, Shephard R. Congenital nasolacrimal duct obstruction: natural history and the timing of optimal intervention. *J Pediatr Ophthalmol Strabismus* 1994; 31: 362-7.
9. El-Mansoury, Calhoun JH, Nelson LB, Harley RD. Results of late probing for congenital nasolacrimal duct obstruction. *Ophthalmology* 1986; 93: 1052-4.
10. Paul TO. Medical management of congenital nasolacrimal duct obstruction. *J Pediatr Ophthalmol Strabismus* 1985; 22: 68-70
11. Katowitz JA, Welsh MG. Timing of initial probing and irrigation in congenital nasolacrimal duct obstruction. *Ophthalmology* 1987; 94: 698-705.
12. Stager D, Baker JD, Frey T, Weakley DR Jr, Birch EE. Office probing for congenital nasolacrimal duct obstruction. *Ophthalmic Surg* 1992; 23: 482-4
13. Robb RM. Probing and irrigation for congenital nasolacrimal duct obstruction. *Arch Ophthalmol* 1986; 104: 378-9
14. Young JDH, MacEwen CJ, Oqston SA. Congenital nasolacrimal duct obstruction in the second year of life: a multicenter trial of management. *Eye* 1996; 10: 485-91
15. Goldblum TA, Summers CG, Egbert JE, Letson RD. Office probing for congenital nasolacrimal duct obstruction: A study of parental satisfaction. *J Pediatr Ophthalmol Strabismus*; 1996; 33: 244-7.
16. Kassoff J, Meyer DR. Early office based vs. late hospital based nasolacrimal duct probing. *Arch Ophthalmol* 1995; 113: 1168-71
17. Nelson LB, Calhoun JH, Menduke H. Medical management of congenital nasolacrimal duct obstruction. *Ophthalmology* 1985; 92: 1187-90
18. Wesley RE. Inferior turbinate fracture in the treatment of congenital nasolacrimal duct obstruction and congenital nasolacrimal duct anomaly. *Ophthalmic Surg* 1985; 26: 368-71.
19. Mannor GE, Rose GE, Frimpong-Ansah K, Ezra E. Factors affecting the success of nasolacrimal duct probing for congenital nasolacrimal duct obstruction. *Amer J Ophthalmol* 1999; 127: 616-7.
20. Zwaan J. Treatment of congenital nasolacrimal duct obstruction before and after the age of 1 year. *Ophthalmic Surg Lasers* 1997; 28: 923-6.

Author Information

J.B. Shrestha, MD

Lecturer; Pediatric Ophthalmologist, Institute of Medicine, B.P. Koirala Lions Center for Ophthalmic Studies

S. Bajimaya, MD

Consultant Ophthalmologist, Lumbini Eye Institute

A. Hennig, MD

Program director, Sagarmatha Choudhary Eye Hospital

Khanal Shankar, MD RES

Institute of Medicine, B.P. Koirala Lions Center for Ophthalmic Studies