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

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ABSTRACT

Congenital Nasolacrimal Duct Obstruction (CNLDO) is one of the commonest causes of Childhood epiphora. This study was carried out at Sagarmatha Chaudhary Eye Hospital (SCEH), Lahan to determine the success rate of probing and syringing in children below 18 months of age with CNLDO. A hospital based prospective interventional study of 106 children with age 4 to 18 months (Mean 7.67, SD 4.37) who underwent probing and syringing under topical anesthesia in minor procedure room of OPD. The children were divided into 3 age groups, Group A (age d"6 months), Group B (age=7-12 months) and Group C (age=13-18 months). Success of probing was defined as complete relief of signs and symptoms on follow up at 3-6 weeks. Out of 106 children with CNLDO below 18 months of age, 97 (91.5%) children had better outcome with first attempt of probing. First attempt of probing resulted in resolution in 92.3% (108 out of 117) eyes; 95.6%, 92.7%, 87.1% in the age group less than 6 months, 7-12 and 13-18 months respectively. 9 eyes underwent a repeat procedure of which 6 eyes were cured. Probing and syringing below 6 months of life has shown to be very effective with almost 100% success. The overall success of probing and syringing among children less than 18 months was 97.4%.

Keywords: Congenital nasolacrimal duct obstruction – childhood epiphora- probing and syringing.

INTRODUCTION

Congenital Nasolacrimal Duct Obstruction (CNLDO) is among the most commonly encountered congenital anomaly in pediatric age group, present in up to 30.0% of newborn infants.[1-3] However such an obstruction is clinically evident in only 2.0-6.0% of full term infants. CNLDO is one of the common causes of childhood epiphora, which is usually caused by a membranous block of valve of Hasner covering the nasal end of nasolacrimal duct. The obstruction is most frequently the result of incomplete canalization with persistence of the fibrous layer of the nasal mucoperiosteum.[4,5] 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 50.0-90.0% of children during the first six months of life.[3,4] Conservative management of the newborn with topical antibiotics and properly performed Criggler 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 79.0-98.0%[3,5,8] as compared with a natural resolution rate of 76.0-100.0%.[5,9,10] 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.[11,12] Although other works have identified either no difference in success rate of probing at different age[5,13-15] 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.[5,7,16,17] 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

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)		
Laterality of CNLDO	**BE**	**RE**	**LE**	**BE**	**RE**	**LE**	**BE**	**RE**	**LE**
No. of Children	5	20	15	6	18	11	0	16	15
No. of eyes for 1st 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

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 OPD 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. 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 Nettleships punctum dilator, Sets of Bowman's lacrimal probe (No. 000) and lacrimal irrigation cannula with 5 ml glass syringe. 4.0% 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 recalled after 3 weeks for the second time probing in case of failure of first probing. 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 60.0%; female 40.0%), 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 from non-improved cases of first time probing (9 eyes). Overall 3 eyes did not improve at last.

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 50.0% (2 eyes) in

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 1st attempt	43 (95.6%)	38 (92.7%)	27 (87.1%)	0.39
Success after 2nd attempt	2 (100.0%)	2 (66.7%)	2 (50.0%)	0.47
Over all success rate	45 (100.0%)	40 (97.0%)	29 (93.5%)	0.21

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).

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 al*[5] and Mannor *et al*[19] 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 100.0% in group A, 97.0% in group B and 93.0% in group C.

Our result quite corresponded with the report by Robb[1] and Zwaan.[20] In a study by Robb[1] 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 90.0%, rising to 96.0% after a second probing. Cure rate for entire groups were 92.1%. Similarly in a study conducted by Zwaan[20]compared the outcome in children <1, 1-2, >2 years, the cure rate were 97.0%, 88.0% and 93.0% respectively (P= 0.13).

Honavar *et al*[5]and Mannor *et al*[19]observed the outcome especially above 24 months (Table-3) where as we observed the rate of success below 18 months old children. Robb[1]and Zwaan[20] 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 100.0% 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 al*[5] and Robb[1] reported encouraging outcome with repeat probing in

Table-3: Comparative outcome of probing in different age group as quoted by different authors

Authors	**≤ 6 mths**	**≤ 12 mths**	**≤ 18 mths**	**≤ 24 mths**	**≤ 36 mths**	**≤ 48 mths**	**≤60mths**
Present study	100.0%	97.0%	93.5%	-	-	-	-
Honavar et al[5]	-	-	-	-	97.1%	75.0%	42.9%
Mannor et al1[9]	-	92.0%	-	89.0%	80.0%	71.0%	42.0%
Robb[1]	-	88.9%	96.8%	90.7%	96.4%	92.6%	-
Zwaan[20]	-	97.0% (<1 yrs)	-	88.0% (1-2 yrs)	93.0% (>2 yrs)	-	-
Mths: Months; ≤ less than or equal to							

children who had previously undergone unsuccessful probing. They reported almost 50.0% 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.

ACKNOWLEDGEMENTS

We express our gratitute 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.

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