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Result of Probing for Congenital Nasolacrimal Duct Obstruction in Children Less than 1 Year Versus Children Greater than 1 Year

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Abstract

Congenital obstruction of nasolacrimal duct is a very common cause of epiphora in new born children. Controversy exists regarding the natural course and management of children with congenital nasolacrimal duct obstruction. The present study was undertaken on 80 children of congenital nasolacrimal duct obstruction with no previous intervention. They were divided into two groups of 40 each. Group 1 had children aged less than 1 year and Group 2 comprised of children older than 1 year. Probing was done under general anesthesia. The mean age of the patients in Group 1was 8.35±2.65 months and that of the children in Group 2 was 27.5±11.98 months. The overall success rate of probing was 78.75%. Success rates in Group 1 and Group 2 were 85% and 72.5%, respectively. The difference between the two groups was statistically insignificant. However, there was a significant difference in the success rate of probing depending on the type of obstruction ($p<0.05$). Membranous obstruction of NLD was associated with increased success rates of probing as compared to firm obstruction of NLD ($p=0.001230$, Yates corrected Chi square =0.0009578). Probing is a safe option of treating congenital nasolacrimal duct obstruction. Probing is beneficial in older children although the success rate of probing tends to decline with increasing age. Firm anatomical obstruction in nasolacrimal duct is associated with a decline in the success rate of probing.

Key Words

Probing, Congenital nasolacrimal duct obstruction, Epiphora, Chronic dacryocystits

Introduction

Congenital obstruction of nasolacrimal duct is a very common cause of epiphora in new born children occurring in nearly 20%-30 % (1,2). However, only 1% to 6% of these children present with clinical features of NLD obstruction (1,2). Failure of canalization of nasolacrimal duct leads to epiphora in new born. Canalization of nasolacrimal duct usually takes place at the end of six months of intrauterine life but can be delayed for several weeks or months after birth. Diagnosis of this condition is established by history of epiphora within first few weeks after birth and confirmed by applying pressure on the nasolacrimal sac area which leads to reflux of mucopurulent material from either punctum.

Controversy exists regarding the natural course and management of children with congenital nasolacrimal duct obstruction. Crigler described a conservative technique of applying pressure over nasolacrimal sac area to build up hydrostatic pressure and clear the obstruction (3). If the initial conservative management fails then probing of nasolacrimal duct is done. Delay in probing beyond 12 months of age is associated with decline in success rate and this worsens with age (4-6). Early probing decreases ocular morbidity due to epiphora, discharge and chronic dacryocystits. However, studies have shown good results of probing in children older than 13 months of age (7,8). Late probing in children greater than 12 months gives additional advantage of providing adequate time for spontaneous resolution of NLDO and thus negating the need of probing in the first place. The present study aims to compare the success rate of primary probing in children less than or equal to 1 year versus children with age

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greater than 1year of age group.

Material and Methods

A random prospective interventional study was conducted in 80 patients over a period of 2 years (June 2016- June 2018) in Government Medical College, Jammu. Informed consent for probing under general anesthesia was obtained from parents/ guardians.

Patients were divided into two groups with 40 children in each group:

Group 1: Children with age less than or equal to 1 year
Group 2: Children with age greater than 1 year

Inclusion Criteria:

1. Children aged 3 to 60 months with history suggestive of CNLDO.
2. Children not responding to conventional conservative treatment.

Exclusion Criteria:

1. History of prior probing or any nasolacrimal surgery
2. Children with craniofacial anomalies
3. Any secondary cause of watering eye.
4. Children with history of trauma to head and face (causing damage to nasolacrimal system).
5. Eye conditions such as congenital dacryocystocele, punctal agenesis, ectopic puncta, congenital ectropion, blepharitis, congenital glaucoma and conjunctivitis.
6. Any nasal pathology.
7. Children unfit for general anesthesia
8. Children whose parents/guardians were unwilling to give consent.

Procedure was performed under short general anesthesia (inhalational) by one ophthalmic surgeon. After dilatation of punctum with Nettleship punctum dilator, Bowman's probe (0 and 00) was introduced vertically into punctum and advanced vertically for 1st 2mm of canaliculus. Then the probe was gently rotated medially and advanced until a region of bony firmness was encountered indicating nasolacrimal sac area. At this point, probe was turned vertically downwards and passed through the nasolacrimal duct gently but firmly overcoming the obstruction. Postoperative treatment included combination of antibiotic (Tobramycin) and weak steroid (Fluorometholone) eye drops QID and pediatric Xylometazoline nasal drops for two weeks. Children were followed on 1st day, 1st week, 1st month and 3rd month post-operatively. Probing was considered successful when there was complete resolution of watering and discharge and there was no reflux from lacrimal sac area on pressure and examination did not show signs of NLDO one week after the procedure.

Data was entered in MS excel 2007 and presented as mean values, percentages and proportions. Chi-square test was used for statistical analysis

Results

Mean age of children in group 1 was 8.35± 2.65 months and group 2 was 27.55± 11.98 months. There were 46 males and 34 females. *(Table 1 & 2, Figure 1&2)*

Table 1. Showing Sex Distribution

Group	Total	Male	Female
1	40	22	18
2	40	24	16

TABLE 2. Showing Age Distribution

Group	Age Range (Months)	Mean Age (Months)
1	3-12	8.35±2.65
2	14-60	27.5±11.98

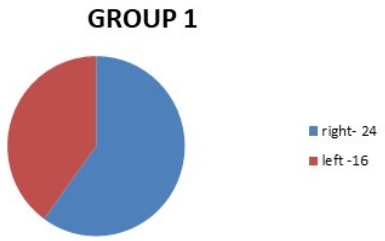

Figure 1: Showing Distribution Of Eyes Probed In Group 1

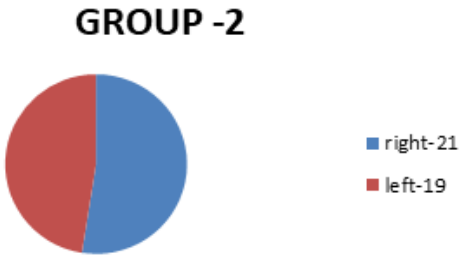

Figure 2: Showing Distribution Of Eyes Probed In Group 2

Table 3. Showing Results Of Probing

Group	Successful Probing	Failed Probing
1	85% (34)	15% (6)
2	72.5% (29)	27.5% (11)

p-value= 0.09, Odds ratio= 2.129

Table 4. Showing Results Of Probing In Different Types Of Anatomical Obstructions In Nasolacrimal Duct

Type Of Obstruction	No. of Cases	Successful Probing	Failed Probing
Membranous	71	60 (84.5%)	11(15.5%)
Firm	9	3(33.3%)	6(66.7%)

p value= 0.001230, Odds Ratio=0.0009578

The overall success rate of probing was 78.75%. Success rates in Group 1 and Group 2 were 85% and 72.5%, respectively. *(Table 3)* No significant difference in the results of two groups was found on applying chi square test (p value=0.09, Odds ratio-2.129).

CNLDO was membranous in 88.75% (71eyes) and firm in 11.25% (9 eyes). 84.5% of cases (60 eyes) with membranous obstruction were successfully cured and 33.3% of cases (3 eyes) with firm obstruction had a successful outcome. There was a significant difference in the success rate of probing depending on type of obstruction ($p<0.05$). Membranous obstruction of NLD was associated with increased success rates of probing as compared to firm obstruction of NLD (p=0.001230, Yates corrected Chi square =0.0009578). *(Table 4)*

Discussion

Probing of nasolacrimal duct is the definitive therapeutic procedure in the management of congenital nasolacrimal duct obstruction. The precise timing of initial probing remains controversial. Success rate of first probing in older children remains controversial and is reported to range between 54.7- 97% depending on child's age at probing (4-6,9-12).

Kashkouli *et al.* and Takahashi *at al*. recommended early probing of the nasolacrimal system, only after one to two weeks of topical therapy with antibiotic drops (4,5).

It is also reported that delayed probing beyond 13 months is associated with lower cure rates because of fibrosis due to prolonged inflammation in the lacrimal drainage system with increasing age (9,13).

In our study, overall success rate was 78.75% which is comparable to previous studies (5,6,14,15). In our study, patients were divided into two groups- children less than or equal to 1 year and children greater than 1 year. Overall success rate in children less than 1 year was 85%. Cassady reported similar results - 86% in children less than 1-year age (11). Havins and Wilkins reported 94% success rate for probing in children less than 8 months (16).

In our study, overall success rate in children greater than 1 year of age was 72.5%. Takahashi *et al*. reported similar success rates of probing (76.4%) in children between 13-18 months of age but the cure rate declined to 33.3% in children older than 24 months (5). Robb found more than 90% success rate in late and very late probing (9). Abrishami *et al.* performed retrospective study on consecutive series of patients with congenital NLDO who underwent late (after 15 months of age) nasolacrimal duct probing for the first time and reported overall success rate of 75% (17).

In our study, all probing procedures were performed under GA because it increases the accuracy of procedure and reduces the potential risk of trauma to delicate structures of the lacrimal drainage system. Macewen recommend probing under GA as a safe option as a primary surgical modality for treatment of CNLDO in children with better control over the procedure (18). On the contrary, some authors prefer topical anesthesia for probing in children (6,19).

Older children (age 2-6 years with simple obstruction undergoing late probing had an excellent success rate (97.72%) in the study conducted by Maheshwari (20). In our study, no significant difference was found between success rates of probing in children less than one year versus greater than 1 year (p value=0.09). Hence, late initial probing is also advisable in older children

Conclusion

Probing under general anesthesia is a safe option of treating congenital nasal duct obstruction. Probing is advisable in older children although the success rate of probing tends to decline with increasing age. Firm anatomical obstruction in nasolacrimal duct is associated with a decline in the success rate of probing.

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