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Efficacy of probing in congenital nasolacrimal duct obstruction in paediatric patients: A prospective observational study in a tertiary care teaching hospital Telangana India

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***Abstract*---**Background: Congenital nasolacrimal duct obstruction (CNLDO) is the most common disorder leading to epiphora and is usually due to failure of canalization of the nasolacrimal duct (NLD) at its distal end Objectives: To study the efficacy of probing in congenital nasolacrimal duct obstruction in 2 to 4 years of children. Methodology: Probing was carried out through the punctum by using bowman's probe which was available in various sizes from 0.7mm to size 1.1mm. Appropriately sized probe was directed vertically first then gently directed medially until bony feeling was encountered. Firm pressure was applied to probe, attempted to advance probe beyond obstruction in NLD. Left the probe for 1 minute in that position. After the procedure topical antibiotic eye drops were advised for 2 weeks. Results: The overall success rate of probing in 2 to 4 years age group was 63.8%. In total 50 patients with 57 eyes 7 were bilateral cases in that 3 (42.9%) were treated successfully. In 43 unilateral cases 30 (69.8%) were treated successfully. The success rate of probing in right eye (70.8%) and left eye (68.2%). Conclusion**:**

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Probing can be still viable option for children aged 2years and more with CNLDO. The efficacy of probing decline with increasing age.

Keywords---Probing, Nasolacrimal duct obstruction, Eye, Pediatric Patients.

Introduction

Congenital nasolacrimal duct obstruction (CNLDO) is the most common disorder leading to epiphora and is usually due to failure of canalization ofthe nasolacrimal duct (NLD) at its distal end.[1] Congenital nasolacrimal duct obstruction is a very common problem in pediatric agegroup. It is present in up to 20 % of new borns ,[2] but only 1 to 6% of children become symptomatic.[3] The cause of obstruction in most cases is incomplete canalization of the nasolacrimal duct at the level of valve of hasner ,resulting in membranous obstruction. A complete osseous obstruction occurs with anomalous bony passage.Other causes are absence of puncta, maldevelopment of canaliculi, nasal bonesthat causes block at the entrance of NLD in the nose. Children with midline facial anomalies, craniosynostosis are at increased risk of CNLDO. This CNLDO can beunilateral or bilateral.Tearing may occur in other conditions also such as congenital glaucoma, malposition of eye lashes, exposure to irritants. All these requires careful examination.Congenital nasolacrimal duct obstruction leads to stasis of tears and mucoid discharge which provides fertile environment for secondary bacterial infections. Standard management in first few months of life include hydrostatic massage of lacrimal sac and topical antibiotics. Mostly obstruction resolve spontaneously without any surgical intervention.[4-8] The optimum age of syringing and probing as a treatment modality for persistent congenital nasolacrimal duct obstruction is between 12 to 18 months as spontaneous resolution occurs in 95 % of affected infants by one year of age.[3] If spontaneous resolution does not occur by one year of the age, patient may be treated by probing.According to the studies, the success rate of probing at 1 year of age is 95% and at 2 years it is 60%[3,9]. Some authors reported that success rate of probing decreases beyond 1 yr of age.[10-12] Therefore some clinicians preferred silicon tube intubation after 18 months of age·[13] Some investigators claimed that increasing age has no significant effect on success rate of probing in older children [14-17]. If child had passed the age of 05 or 06 years the success rate of probing decreases such an extent to treat the obstruction with DCR.

Materials and Methods

This study titled “Efficacy of Probing in Congenital Nasolacrimal Duct Obstruction in Paediatric Patients: A Prospective Observational study in a Tertiary Care Teaching Hospital Telangana India” was carried out during the period of from Nov 2018 to Oct 2020.The study was conducted on 50 children (57 eyes) with congenital nasolacrimal duct obstruction admitted during the above period in in Government medical college and hospital ,Nizamabad,Telangana,India with an aim to evaluate the Efficacy of Probing in Congenital Nasolacrimal Duct Obstruction in Paediatric Patients.

Inclusion Criteria
Children between 2 to 4 years of age with congenital nasolacrimal duct obstruction.

Exclusion Criteria
Children <2years and >4 years of age who were diagnosed with nasolacrimalduct obstruction,Acute dacryocystitis,Acute canaliculitis,Previous history of probing, Other causes of epiphora ,Associated with other ocular pathologies,Patients not fit for general anesthesia,Associated with nasal pathology

Ethics: This study was approved by the Institutional Ethics Committee GMC, Nizamabad. An informed written consent was taken from all the patients involved in the study after explaining regarding the study.

Study Procedure: 50 patients with 57 eyes who were diagnosed as congenital nasolacrimal duct obstruction after taking informed consent from parents subjected for preanesthetic checkup and taken up for probing under general anesthesia.

Probing procedure: Procedure was performed under general anesthesia. Under aseptic condition eyelids were retracted by placing speculum after that upper and lower punctum dilated by using Nettle ship punctum dilator. After dilatation of puncta probing was done. Probing was carried out through the punctum by using bowman's probe which was available in various sizes from 000 (0.7mm) to size (1.1mm). Appropriately sized probe was directed vertically first then gently directed medially until bony feeling was encountered. At this point the probe was turned vertically and advanced until resistance was encountered. Firm pressure was applied to probe, attempted toadvance probe beyond obstruction in NLD. Left the probe for 1 minute in that position. Patency is confirmed by touching bowman's probe with another metal probe which was introduced through the respective nare. After the procedure topical antibiotic eye drops were advised for 2 weeks. No complications were encountered in all these patients after probing .Follow up: After the probing every patient was followed on day 1, 1 week, 1 month and after 3 months. On each follow up asked history of watering or discharge, did ROPLAS and FDDT. Probing was considered successful after 3 months without symptoms and negative ROPLAS and positive FDDT. In patients whom probing was unsuccessful advised for re probing and silicon tube intubation and DCR according to their age.

Results

In this prospective study, 57 eyes of 50 patients with congenital nasolacrimal duct obstruction were taken for probing. In these 50 patients 26(52%) were females and 24(48%) patients were males. In 50 children 7(14%) were having bilateral involvement and 43(86%) were having unilateral congenital nasolacrimal duct obstruction. RE was affected in 24(48%) children and LE was affected in 19(38%) children. Children with CNLDO in 2 to 4 years age group were taken for study in that32 (64%) were in 24 to 35 months age group and 18 (36%) were in 36 to 48 months age group. In these 57 eyes, 36 eyes (63.8%) were treated successfully with probing. Probing was unsuccessful in 21 eyes (37.8%). In 24 to

35 months age group 34 eyes were treated with probing in that probing was successful in 28 (82.4%) eyes and unsuccessful in 6 (17.6%) eyes. In 36 to 48 months age group 23 eyes were treated with probing in that probing was successful in 12 (52.2%) eyes and unsuccessful in 11 (47.8%) eyes. The overall success rate of probing in 2 to 4 years age group was 63.8%. In total 50 patients with 57 eyes 7 were bilateral cases in that 3 (42.9%) were treated successfully. In 43 unilateral cases 30 (69.8%) were treated successfully. The success rate of probing in right eye (70.8%) and left eye (68.2%).

Table: 1 Gender Distribution

SEX	NO.CASES(n=50)	PERCENTAGE
MALES	24	48%
FEMALES	26	52%

Table: 2 Age Distribution

AGE(in months)	No of patients(n= 50)	percentage
24 – 35 months	32	64%
36 – 48 months	18	36%

64% (32) children were aged between 24 - 35 months, 36% (18) were aged between 36 – 48 months

Table: 3 Laterality Distribution

EYE	NO OF PATIENTS (n=50)	PERCENTAGE
RE	24	48%
LE	19	38%
BE	7	14%

In 50children 24 (48%) were having RE CNLDO, 19 (38%) were having LE CNLDO, 7 (14%) were having BE CNLDO.

Table: 4 Laterality Distribution

LATERALITY	NO OF PATIENTS (n=50)	PERCENTAGE
UNILATERAL	43	86%
BILATERAL	7	14%

Table: 5 Success rate of probing

OUTCOME	NO OF CASES(total50)	NO OF EYES(total57)	PERCENTAGE
SUCCESSFUL	33	36	63.2%
UNSUCCESSFUL	17	21	36.8%

57 eyes of 50 patients underwent for probing, in that probing was successful in 36(63.2%) eyes and unsuccessful in 21(36.8%) eyes

Table: 6 Age Wise Success Rate of Probing:

AGE	TOTAL NO OF EYES	SUCCESSFUL	UNSUCCESSFUL
24 – 35 MONTHS	34	28 (82.4%)	6 (17.6%)
36 – 48 MONTHS	23	12 (52.2%)	11(47.8%)

In 24 to 35 months age group total 34 eyes of 32 patients were treated with probing.In that probing was successful in 28 (82.4%) eyes and unsuccessful in 6 (17.6%) eyes. In 36 to 48 months age group 23 eyes of 18 patients were underwent for probing in that 12 (52.2%) eyes were treated successfully and in 11 (47.8%) eyes probing was unsuccessful (p=0.014).

Table: 7 LATERALITY WISE SUCCESS RATE OF PROBING:

	UNILATERAL(TOTAL 43 PATIENTS) n=43	BILATERAL(TOTAL 7 PATIENTS) n=7
SUCCESSFUL	30 (69.8%)	3 (42.9%)
UNSUCCESSFUL	13 (30.2%)	4 (57.1%)

Total 50 children with CNLDO treated with probing in that 7 were bilateral, 43 were unilateral cases. Probing was successful in 3 (42.9%) bilateral cases and 30 (69.8%)unilateral cases. Success rate is more in unilateral cases.

Discussion

In our study, 57 eyes of 50 children with CNLDO in the age group of 2 to 4 years were studied. In that 32 children were in 24 to 35 months age group and 18 were in 36 to 48 months age group. Out of 50 children 26(52%) were females and 24(48%)were male. There was no significant difference in gender distribution. Out of 50 patients 43(86%) were with unilateral CNLDO and 7 (14%) were with bilateral CNLDO. CNLDO was present in the right eye of 24 (48%) patients, in left eye of 19 (38%) patients. The overall success rate of probing in 2 to 4 years age group of 50 children with 57 eyes were 63.2% (36 eyes). The success rate of probing in unilateral cases (69.8%) was more than bilateral cases (42.9%). In present study success rate of probing was more in 24 to 35 months age group (82.4%) when compared to 36 to 48 moths age group(52.5%) (p value 0.014).Probing for congenial nasolacrimal duct obstruction is standard therapeutic procedure. Controversy exists regarding the outcome of probing in children older than 1 year. Ffookes[18] cited that lacrimal abscess formation as a possible complication of delayed surgical treatment of nasolacrimal duct obstruction.Advocates of early probing suggest that early correction avoids complications such as acute dacryocystitis. In some studies it is 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.[19] In present study the overall success rate of probing in 2 to 4 years children with CNLDO was (63.2%). The success rate was 82.4% and 52.5% in 24 to 35 months and 36 to 48 months age groups respectively it is in accordance with **Sturrock** and colleagues reported a success rate of 72% in the

second year and 42% in childrenmore than 2 years of age[20] Katowitz and Welsh[11] had a success rate of 76.4% between 13-18 months, but the cure rate declined to 33.3% in children older than 24 months. Mannor[10] and colleagues found a negative correlation between the age and the success rate of probing: 92%,89%,71% and 42% at age12,24,36,48and 60 months, respectivly. Our study is in accordance with Perveen et al [1] study where they showed a significant trend of decreasing success rates with increasing age: 100%, 94%, 84.4%, 83.3%, 61.5% and 33.3% at 6, 12, 18, 24, 36 and 48 months of age, respectively. Kashkouli et al[21] reported that success rate of probing after 24 months was 71.7% and concluded that older children are more likely to havecomplicated, non membranous obstructions that might reduce the cure rate.

In contrast to these studies, El-Mansoury[16], Robb[14], Zwaan[15] and colleagues found more than 90% success rate in late and very late probing. Robb found no difference in cure rate with increasing age and noted an overall success rate of 92% varying from 88.9-96.8% at different age intervals up to and beyond 3 years of age. Honavar et al[22] reported a success rate of 75.0% up to 4 years of age, after whichit was 42.9% in children older than 4 years. Casady et al[23]reported a success rate of 85% for probing in children more than 18 months age.

In present study, out of 50 patients in 24 to 48 months, 24 (48%)were male and 26 (52%) were female it is comparatively relative to the study done by Eshragi et al[24] where the age group was 24 to 60 months in that out of 82 patients 52 (63.5%) were male. In a study done by Rashid et al[25] age group was 2 to 3 year. In that out of 42patients 52.38% were male and 47.62% were female. Honavar et al[22] reported that out o 60 patients in the age group of 24 to 186 months, 34 were male and 26 were female.In present study out of 50 patients 43 (86%) were with unilateral CNLDO and 7 (14%) were with bilateral CNLDO. In accordance with study done by Perveen et al[1]out of 100 patients in the age group of 4 to 48 months, 82 (82%) were having unilateral CNLDO and 18 (18%) were having bilateral CNLDO. In present study right eye is involved in 24 (48%) and in 19 (38%) patients left eye is involved. In a study done by Kashkouli et al[21] in 13 to 60 months age group out of 101, 41 patients (40.5%) the right eye, in 23 (22.7%) the left eye, and in 37 (36.6%) both eyes were involved.

In present study success rate of probing is more in unilateral (69.8%) than bilateral (42.9%). Valcheva et al[26] showed that success rate of probing in unilateral (90%) was more than bilateral (83%). Indicates that bilateral CNLDO may be having more complex anatomical obstruction.In our study there was no significant difference of efficacy of probing between rightand left eye.In our study after probing of the children under general anesthesia advised topical antibiotics for 1 to 2 weeks and followed regularly till 3 months and checked for any symptoms like watering, discharge, ROPLAS, FDDT, or any complications. In present study no child was having complication due to probing. After 3 months of

follow up patients who were having symptoms were advised for re probing, silicon tube intubation and DCR as for their need.

Conclusion

From the results it can be concluded that probing can be still viable option for children aged 2years and more with CNLDO. The efficacy of probing decline with increasing age: more than 35 months. It is a predictor of poor outcome. Bilateral CNLDO has poor out come than unilateral indicate bilateral affection may have more complex anatomical obstruction. It is better to do probing at early age to get good outcome.

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