Original Article

Congenital Nasolacrimal Duct Obstruction: Presentation and Mangement

Nazullah Khan, Mohammad Naeem Khan, Sanaullah Jan, Shad Mohammad

Pak J Ophthalmol 2006, Vol. 22 No. 2

See end of article for authors affiliations

.....

Corrrespondence to:
SanaUllah Jan
H.No: 455, Street No.18
Sector: E-2, Phase 1
Hayatabad, Peshawar

Received for publication
June' 2005
.....

Purpose: To study presentation of congenital nasolacrimal duct obstruction and its outcome after conservative treatment and probing.

Material and Methods: 100 eyes of 81 children were studied. Children were divided into two groups. In group 1, children upto age of 6 months were included. They were initially treated conservatively with massage and topical antibiotics. In 2nd group children between age 6 months to 3 years were included. They all had conservative treatment but had not responded to it. So they underwent probing.

Results: In first group, out of 25 patients with 30 involved eyes, 83% were relieved of symptoms with conservative treatment. In 2nd group, out of 56 children with 70 involved eyes, 87% responded to 1st probing, 9% responded to 2nd probing while 4% were not relieved even with 3rd probing. The overall success in both conservative treatment and probing was 97%.

Conclusion: Most of the children with congenital nasolacrimal duct obstruction are relieved with conservative treatment. In the remaining unsuccessful cases probing is done, which is successful in majority of children.

Congenital Nasolacrimal duct (NLD) obstruction is present in 4-6% of otherwise normal newborn children. It is due to the failure of canalization or persistence of membrane at the lower end of the nasolacrimal duct. A sticky and watery eye with regurgitation of fluid or pus on pressure over lacrimal sac confirms the diagnosis. However, it is important to exclude congenital glaucoma and other causes of watering eye in infants. Although congenital NLD obstruction can be distressing for both the child and parents, but fortunately there is a high rate of spontaneous resolution during the first few months of life[1]. Many of the persistent cases respond to conservative treatment with lacrimal sac massage and topical antibiotic drops[2]. In a large majority of cases, the cause of failure of conservative treatment is an improper technique of lacrimal sac massage. In unresponsive cases, probing of the NLD is required. Probing is performed under general anaesthesia and it is preferable to probe through upper punctum to avoid any inadvertent damage to the lower punctum and canaliculus. Probing is contraindicated during the acute phase of dacryocystitis because the edematous, inflamed mucosa can get injured, leading to fibrosis and stricture. In very few cases, even probing may not achieve a permanent opening of the NLD. In such cases silicone tube intubation of lacrimal passages is required to achieve a permanent cure. The aim of this study is to find presentation of nasolacrimal duct obstruction and its outcome after conservative treatment and probing.

MATERIAL AND METHODS

This is a prospective observational and comparative study, conducted in the Department of Ophthalmology, PGMI, Lady Reading Hospital Peshawar from June 1997 to July 1999. A total of 100 eyes were treated in 81 patients. For purpose of management, children were divided into two groups depending upon their age at presentation. Group 1 patients were treated conservatively. Group 2 patients were treated with probing under general anaesthesia.

Inclusion criteria for patients in 1st group were children with NLD obstruction, no associated major co-morbidity or systemic disease and age range of 1 day to 6 months. Inclusion criteria for patients in 2nd group were children with NLD obstruction, no associated major co-morbidity or systemic pathology, no previous treatment other than conservative and age limit between 6 months to 3 years.

Careful and detailed history was taken regarding the presenting complaints. Family history and history of previous treatment were recorded. Careful evaluation was carried out to rule out other ophthalmological and systemic causes of epiphora. In group 1, the children were treated conservatively with proper lacrimal massage and topical antibiotics. Strict observation and follow up was maintained for at least 3 months. Probing was performed after 6 months of age in those patients who didn't respond to conservative treatment. Patients in group 2 had already taken conservative treatment elsewhere. Probing was carried out in all these effected eyes under General Anaesthesia (GA). Probing was performed through upper canaliculus and was confirmed with metal – to –metal touch in the inferior meatus of the nose. All the patients were discharged on the same day and were followed after 15th, 45th and 90th day of treatment in both the groups. The parents were directed to continue lacrimal massage and instillation of antibiotic (Tobramycin) eye drops even after successful probing till next visit.

RESULTS

100 eyes of 81 patients were evaluated in the study. Out of these, 52 (64.2%) were male and 29 (35.8%) were female patients. Nineteen (23.5%) had bilateral NLD block and 62 (76.5%) cases had unilateral involvement. Twelve (14.8) children presented with epiphora only while 69 (85.2%) patients came with watering with purulent discharge.

Group I:

Twenty-five (30.9%) children were included in this group. Patients in this group were initially treated conservatively with proper lacrimal massage and topical antibiotics. In this group out of 25 children, 16 (64%) were male and 9 (36%) were females.

Age distribution of children in this group is shown in figure 1.

Twenty (80%) cases were having unilateral involvement and 5 (20%) cases had bilateral NLD block. Right eye was involved in 16 (53.3%) cases and left eye in 14 (46.7%) cases.

Results of group 1 cases after the 90th day of follow up are shown in (Table 1).

The success rate of conservative treatment at different visits is shown in figure 2.

Group II:

56 (69.1%) children between ages of 6 months to 3 years were included in this group. Male patients were 36 (64.3%) and 20 (35.7%) were female patients. Age distribution of patients in this group is shown in figure 3.

Forty-Two (75%) cases had unilateral involvement while 14 (25%) had bilateral involvement.

The right eye was involved in 34 (48.6%) cases and 36 (51.4%) had involvement of the left eye. All patients in this group had received conservative treatment elsewhere before presenting to us. All of them underwent probing under GA. Outcome of treatment by probing at the final day of follow up is shown in Table 2. Thus in the 2nd group total of 67 eyes were cured. The success rate was 87.1% after one probing and 66.7% after the second probing in the eyes where the first probing failed (Table 3).

Patients were instructed to continue lacrimal massage even after probing and some of cases with residual symptoms were relieved. The probing was done under GA. In 59 (84.3%) cases the end of the probe encountered low resistance with a feeling of sudden release due to puncture of the membrane at the lower end of the nasolacrimal duct. In 8 (11.4%) cases continued resistance was felt throughout the length of nasolacrimal duct upto nasal cavity. No major complications due to probing had occurred.

Minor bleeding was observed in 20% of cases during probing.

DISCUSSION

Congenital nasolacrimal duct obstruction (CNLDO) is a common disorder of the lacrimal system. It is usually caused by failure of canalization of epithelial cells that form the nasolacrimal duct at its entrance into the nose (valve of Hasner). Its features include an excessive tear lake, overflow of tears onto the lids and cheek and reflux of mucoid material that is produced in the lacrimal sac[3].

We studied 100 eyes of 81 patients. Twelve (14.8) cases presented with epiphora without discharge. Remaining 85.2% presented with increased lacrimation mixed with mucopurulent discharge. Out of 81 patients, 52 (64.2%) were male patients and 29 (35.8%) female. Sixty-two (76.5%) had unilateral involvement and 19 (23.5%) had bilateral involvement.

These figures are comparable to the study done by Halipota et al [4] who reported that 65% of cases were male and 35% female. Further, in his study, 71% cases were unilateral and 29% bilateral, while Robb[5] observed bilateral involvement in 15.4% of patients.

Table 1: Result of Group I Patients

Procedure	No of eyes	Successful n (%)	Failed n (%)
Conservative	30	25 (83.3%)	05(16.7%)
Probing (after 6 month of age)	05	05 (100%)	00%

Table 2: Outcome of group II patients after probing

Procedure	No of eyes	Successful n (%)	Failed n (%)
1st Probing	70	61(87.1%)	09 (12.9%)
2nd Probing	09	06 (66.7%)	03 (33.3%)
3rd probing	03	00	03 (100%)

Table 3: Age wise results of successful probing

Age in months	No of eyes n (%)
07-09	30 (44.8)
10-14	19 (28.4)
16-18	15 (22.4)
18-24	2 (3)
24-36	1 (1.5)
Total	67 (100)

Spontaneous resolution of nasolacrimal duct obstruction occurs with conservative treatment. By conservative treatment we meant gentle massage and topical antibiotics. With application of proper lacrimal massage, the success rate increases with passage of time. The success is judged by reduction in watering of the eyes[6]. Peterson and Robb[7] also observed that with conservative treatment, if practiced appropriately and regularly, majority of the patients with congenital nasolacrimal duct obstruction can be relieved as seen in their out patient department. Kushner in 1982, Franckel in 1988 and Nucci and colleagues in 1989 had the same observation[8].

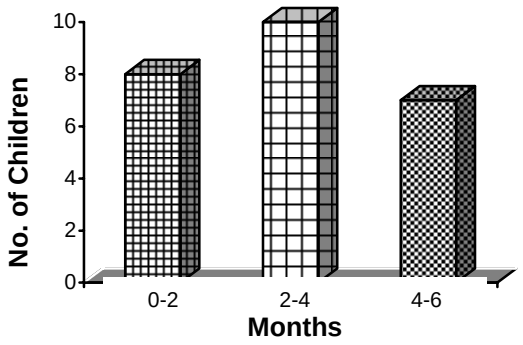

Fig. 1: Group I age-wise distribution

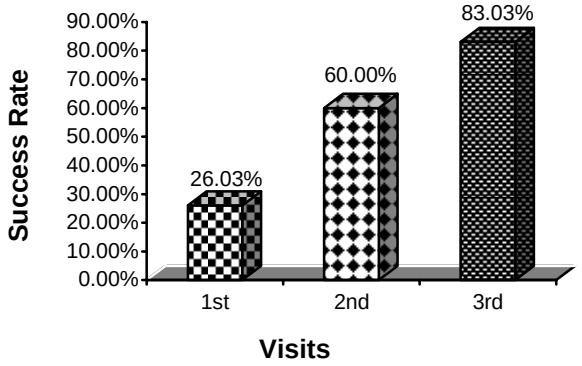

Fig. 2: Group I success rate at different visits

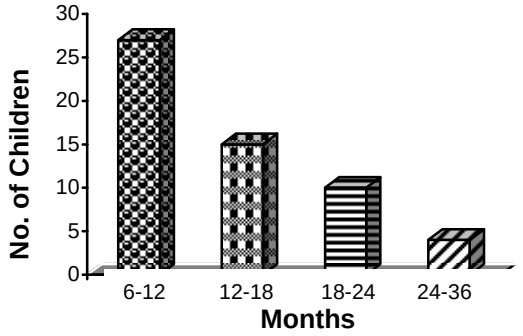

Fig. 3: Group II age-wise distribution

The success rate with conservative treatment in our study is 83%. It is slightly less than spontaneous canalization reported in about 95% of cases with conservative treatment if carried out appropriately[9]. Some of the reasons for low success rate by conservative treatment in our study include illiteracy, poor compliance, improper massage technique, and fear of trauma to eyeball during massage. In the second group, probing was carried out because they had not responded to conservative treatment. Out of total 70 eyes, 61 (87.1%) cases responded to 1st probing. Nine (12.9%) cases failed to open by 1st probing. Out of these patients, 3 cases were even not relieved with 3rd probing and were listed for DCR with intubation. In the successful cases majority of the patients are of 7-9 months of age.

In our study we observed that with increasing age especially beyond 14 months, the success rate of probing decreased. Beyond the age of 2 years the failure rate is almost 100%. Stager et al[10] observed 94% success in patients of less than 9 months of age. The success rate decreased to 84% in the children older than 9 months of age.

Other studies have also shown that probing failure risk increases with increasing age[11,12]. Delay in probing past 12 months of age is associated with decreased success rate as noted by Katowitz and Welsh[13]. Results of probing after 18 months of age are comparatively poor as observed by Havins and Wilkins[14]. On the contrary, some studies have reported success with probing in children upto 5 years of age[15-18].

After probing we continued with lacrimal massage and instillation of antibiotic eye drops and waited for 3 months before the subsequent intervention. Some of the patients with residual symptoms were relieved with this treatment. Sturrock, MacEvan and Young also observed that after successful probing there might be some residual symptoms in upto 30% of patients.

CONCLUSION

Congenital nasolacrimal duct obstruction is a common paediatric pathology seen in ophthalmology out patient. Conservative treatment in these cases is very effective with massage of lacrimal sac area followed by topical antibiotic eye drops. Probing is carried out in unresponsive cases after the age of 6 months and has very good results.

We recommend that parents should be properly guided about conservative treatment and lacrimal sac message probing should be performed in those cases where there is no improvement with proper continuous conservative treatment.

Author's affiliation

Dr Nazullah Khan
Medical Officer
Eye Unit, Khyber Teaching Hospital, Peshawar

Dr Mohammad Naeem Khan
Consultant Ophthalmologist
Khyber Institute of Ophthalmic Medical Sciences,
Hayatabad Medical Complex, Peshawar

Dr Sanaullah Jan
Senior Registrar
Khyber Institute of Ophthalmic Medical Sciences,
Hayatabad Medical Complex, Peshawar

Professor Shad Mohammad
Khyber Institute of Ophthalmic Medical Sciences,
Lady Reading Hospital, Peshawar

REFERENCES

1. **Sturrock SM, Mac Ewan CJ, Young JD.** Long-term results after probing for congenital nasolacrimal duct obstruction. Br J Ophthalmol. 1994; 78: 892-94.
2. **Ghuman T, Gonzales C, Mazon ML.** Treatment of congenital nasolacrimal duct obstruction. Am J Orthopt. 1999; 49: 161-6.
3. **Richard-E Behrmann MD, Robert-M Kleigman MD, et al.** Nelson Textbook of Pediatrics, 16th Edition. WB Saunders. 2000; 1917-8.
4. **Halipota FM, Dahri GR, Anjum N, et al.** Results of lacrimal probing in infants and children. Pak J Ophthalmol. 2000; 6: 47-50.
5. **Robb R.** Success rates of Nasolacrimal Duct probing at time intervals after one year of age. Ophthalmology.1998;105:1307-0.
6. **Tsai C, Kan H, Kao S, et al.** Efficacy of probing the nasolacrimal duct with adjunctive mitomycin-C for epiphora in adults. Ophthalmology 2002; 109: 172-4.

7. **Perterson RA, Robb RM.** The natural course of congenital obstruction of nasolacrimal duct. J Paedr-Ophthalmol-Strabismus. 1978; 15: 246-50.
8. **Daniel MA, Jakobiec FA.** Principles and Practice of Ophthalmology, Clinical Practice. WB Saunders, Philadelphia. 1994: 2812-20.
9. **Kanski JJ.** Clinical Ophthalmology 5th Edition. Butterworth Heinemann, Oxford. 2003: 50-1.
10. **Stager D, Baker JD, Frey T, et al.** Office probing of congenital nasolacrimal duct obstruction. Ophthalmic Surg. 1992; 23: 482-4.
11. **Paul TO, Shepherd R.** Congenital nasolacrimal duct obstruction. Natural history and timing of optimum intervention. J Paed Ophthalmol Strabismus. 1994; 31:362-7.
12. **Kashkouli MB, Kassaee A, Tabatabaee Z.** Intial nasolacrimal duct probing in children under age 5: cure rate and factors affecting success. J AAPOS 2002; 6: 360-3.
13. **Katowitz JA, Welsh MG.** Timing of initial probing and irrigation in congenital nasolacrimal duct obstruction. Ophthalmology 1987;94:698-705.
14. **Havins WE, Wilkin RB.** A useful alternative to silicone intubation in congenital nasolacrimal duct obstruction. Ophthalmic Surg. 1983; 14: 666-70.
15. **Clark RA.** Dilatation probing as primary treatment for congenital nasolacrimal duct obstruction. J AAPOS 2002; 6: 364-7.
16. **Velthoven ME, Wittebol PD, Berendschot TT,et al.** Lacrimal duct probing in young children with a congenital nasolacrimal duct obstruction at the Utrecht Medical Center: generally an effective treatment. Ned Tijdschr Genecskd. 2003; 19: 764-8.
17. **Sing BG, Sing BH.** Repeated probing results in the treatment of congenital nasolacrimal duct obstruction. Eur J Ophthalmol. 2004; 14: 185-92.
18. **Hanavar SG, Prakash VE, Rao GN.** Outcome of probing for congenital nasolacrimal duct obstruction in older children. Am J Ophthalmol. 2000; 130: 42-8.