Late and very late initial probing for congenital nasolacrimal duct obstruction: what is the cause of failure?

M B Kashkouli, B Beigi, M M Parvaresh, A Kassae, Z Tabatabae

Aims: To find the cure rate of late (second year of age) and very late (3–5 years of age) initial probing for congenital nasolacrimal duct obstruction (CNLDO) and to identify the factors contributing to the failure rate of the probing in older children.

Methods: In a prospective interventional case series study, 169 eyes of 125 consecutive patients (1–5 years old) with CNLDO underwent probing under general anaesthesia. Cure was defined as absence of tearing and discharge in the affected eye.

Results: 138 eyes of 101 patients aged 13–60 months (mean 23.4 (SD 10.2)) were included. Of 15 eyes (10.8%) with complex CNLDO, 80% presented after 24 months of age (p<0.0001). The cure rate was 89% in patients 13–24 months of age and 72% after the age of 24 months (p = 0.01). It was 90.2% in the membranous and 33.3% in the complex CNLDO in both late and very late probing (p<0.0001). There was a high correlation (r = 0.97) and no significant difference between the cure rate at 1 week and final follow up.

Conclusion: Accumulation of the complex CNLDO is the main risk factor for failure of probing in the older children. The outcome of the nasolacrimal duct probing at 1 week follow up is highly indicative of the final outcome.
Fisher’s exact test, and logistic regression analysis test were used. In 41 patients (40 eyes) aged 13–24 months (mean 18.4 (SD 2.7) months). Fifty-three patients (52.4%) were male. Of 101 eyes with the complex CNLDO, three (2%) presented at 13–24 months (1/3 = 33.3%) and older than 24 months (4/12 = 33.3%) was the same (Table 2). The cure rate of the membranous CNLDO was different with late (90.6%) and very late (88.8%) probing (p = 0.5).

In the logistic regression analysis, complex CNLDO (p < 0.0001) and not increasing age (p = 0.8) was the cause of failure of probing in the older children.

There was a high correlation (r = 0.97) and no significant difference between the cure rate at 1 week follow up (83.4%) and final cure rate at the 3 month follow up (84%). The same cure rate was achieved at the 1 and 3 month follow up. Sex (p = 0.4), right or left involvement (p = 0.7), bilateral or unilateral involvement (p = 0.3), and chronic dacrocystitis (p = 0.2) did not have a significant impact on the cure rate.

Intraoperative mild bleeding from the punctum occurred in 31 eyes (22.4%), including all eyes with the complex CNLDO, spontaneously resolved.

**DISCUSSION**

Probing of the NLD is a standard therapeutic procedure in the management of the CNLDO. Controversy, however, exists regarding the outcome of probing in children older than 1 year. We found an overall cure rate of 88.6% and 89% in the patients aged 13–18 and 19–24 months, respectively (p = 0.5). This cure rate is comparable with the cure rate in early probing (around the first year of life). The cure rate of very late initial probing was 71.7%, which was significantly (p = 0.01) less than the late probing (89%) for CNLDO. Sturrock and colleagues reported a success rate of 72% in the second year and 42% in children more than 2 years of age. Young and associates stated a cure rate of 54% in children probed after 2 years of age. Mannor and colleagues found a cure rate of 85% in a combined probing and nasal endoscopy among 40 children 10–89 months of age. Mannor and colleagues found a negative correlation between the age and the success of probing. Katowitz and Welsh believed that increasing age after 13 months not only decreases the cure rate but also increases the number and complexity of future procedures. In sharp contrast to those reports, Robb, Zwaan and colleagues, and El-Mansoury and colleagues found more than 90% success rate in late and very late probing for CNLDO. Some authors reported an insignificant effect of the increasing age on the success rate of initial probing after the age of 12 months. However, the issue of complex CNLDO was not noted in their reports.

Based on the type of CNLDO that was assessed intraoperatively, we divided the CNLDO into the membranous and complex type. Kushner reported approximately the same categorisation for CNLDO. There are two schools of thought for the outcome of probing in children older than 1 year. The cure rate of complex CNLDO among patients aged 13–24 months (1/3 = 33.3%) and older than 24 months (4/12 = 33.3%) was the same (Table 2). The cure rate of the membranous CNLDO was not different with late (90.6%) and very late (88.8%) probing (p = 0.5).

**RESULTS**

The age range was 13–60 months (mean 23.4 (SD 10.2) months). Fifty-three patients (52.4%) were male. Of 101 eyes with the complex CNLDO, three (2%) presented at 13–24 months (1/3 = 33.3%) and older than 24 months (4/12 = 33.3%) was the same (Table 2). The cure rate of the membranous CNLDO was different with late (90.6%) and very late (88.8%) probing (p = 0.5).

In the logistic regression analysis, complex CNLDO (p < 0.0001) and not increasing age (p = 0.8) was the cause of failure of probing in the older children.

There was a high correlation (r = 0.97) and no significant difference between the cure rate at 1 week follow up (83.4%) and final cure rate at the 3 month follow up (84%). The same cure rate was achieved at the 1 and 3 month follow up. Sex (p = 0.4), right or left involvement (p = 0.7), bilateral or unilateral involvement (p = 0.3), and chronic dacrocystitis (p = 0.2) did not have a significant impact on the cure rate.

Intraoperative mild bleeding from the punctum occurred in 31 eyes (22.4%), including all eyes with the complex CNLDO, spontaneously resolved.

**DISCUSSION**

Probing of the NLD is a standard therapeutic procedure in the management of the CNLDO. Controversy, however, exists regarding the outcome of probing in children older than 1 year. We found an overall cure rate of 88.6% and 89% in the patients aged 13–18 and 19–24 months, respectively (p = 0.5). This cure rate is comparable with the cure rate in early probing (around the first year of life). The cure rate of very late initial probing was 71.7%, which was significantly (p = 0.01) less than the late probing (89%) for CNLDO. Sturrock and colleagues reported a success rate of 72% in the second year and 42% in children more than 2 years of age. Young and associates stated a cure rate of 54% in children probed after 2 years of age. MacEven and associates found a cure rate of 85% in a combined probing and nasal endoscopy among 40 children 10–89 months of age. Mannor and colleagues found a cure rate of 85% in a combined probing and nasal endoscopy among 40 children 10–89 months of age. Mannor and colleagues found a negative correlation between the age and the success of probing. Katowitz and Welsh believed that increasing age after 13 months not only decreases the cure rate but also increases the number and complexity of future procedures. In sharp contrast to those reports, Robb, Zwaan and colleagues, and El-Mansoury and colleagues found more than 90% success rate in late and very late probing for CNLDO. Some authors reported an insignificant effect of the increasing age on the success rate of initial probing after the age of 12 months. However, the issue of complex CNLDO was not noted in their reports.

Based on the type of CNLDO that was assessed intraoperatively, we divided the CNLDO into the membranous and complex type. Kushner reported approximately the same categorisation for CNLDO. There are two schools of thought for the outcome of probing in children older than 1 year. The cure rate of complex CNLDO among patients aged 13–24 months (1/3 = 33.3%) and older than 24 months (4/12 = 33.3%) was the same (Table 2). The cure rate of the membranous CNLDO was not different with late (90.6%) and very late (88.8%) probing (p = 0.5).
with CNLDO are more likely to represent the pool of children born with a more complicated type of obstruction. Kushner and Honavar and associates showed that the complex CNLDO was more likely to be found in the older patients. Similarly, we found a significantly higher number of complex CNLDO after the age of 24 months. We reviewed past history of patients with the complex CNLDO and did not find history of recurrent dacryocystitis. The type of presenting signs and symptoms was not different between the patients with membranous and complex CNLDO either. It seemed that the significance of the increasing age on reduction of cure rate in patients older than 24 months was the effect of complex CNLDO. Logistic regression analysis showed the significance of complex obstruction and insignificance of increasing age on the failure of initial probing in older children. The complex (firm, non-membranous, or complicated) CNLDO has also been identified as a major risk factor predictive of the failure of probing in some other studies. In our study, the number of patients treated after 24 months of age was small (39 eyes from 29 patients). The number of patients with the complex obstruction was also too small to be statistically compared for recovery rate in different age groups (Table 2). The question is whether patients with complex CNLDO have the same cure rate in early, late, and very late initial probing. A multicentre prospective study would be helpful to find an answer to this.

The outcome at the 1 week postoperative follow up (cure rate, 83.3%) was highly correlated with the final result at the 3 month follow up (cure rate, 84%). The cure rate was the same for the 1 month and 3 month follow ups. Hence, it seems that the early result could represent the final result in probing for CNLDO. Kushner found the same outcome in 21 of the 23 patients at the 6 week and 1 year follow up.

We consider that the evidence from the present study would support the theory of self selection. Overall, the cure rate of probing at the age of 13–24 months is high enough to justify an initial late probing in CNLDO. On the other hand, three quarters of the patients with very late probing were cured. Based on this finding, simplicity, and low rate of complication, very late probing could be considered as an initial surgical step in the management of CNLDO. However, in cases of complex CNLDO one might consider silicone tube insertion following intraoperative assessment of the type of obstruction. Kushner suggested that a reasonable approach to the older child with a CNLDO is to plan a probing procedure with possible alternative plans if a complex obstruction is found. MacEven and associates suggested a stepwise probing combined with nasal endoscopy to find and treat the different types of the CNLDO. Some investigators have also suggested intranasal endoscopy with probing or silicone intubation especially in patients with previous failed probing. The outcome of probing at 1 week is highly indicative of the final outcome.

Part of this study was presented in the annual meeting of the European Society of Ophthalmic Plastic and Reconstructive Surgery (ESOPRS), Germany, September 2002.

Authors’ affiliations
MB Kaskhoul, Ocular Adnexal Unit, Rassoul Akram Hospital, Iran University of Medical Sciences, Tehran, Iran
B Beigi, Ocular Adnexal Unit, Norwich University Hospital, Norwich, UK
M M Parvareh, Rassoul Akram Hospital, Iran University of Medical Sciences, Tehran, Iran
A Kassae, Z Tabatabae, Ocular Adnexal Unit, Farabi Eye Hospital, Tehran University of Medical Sciences, Tehran, Iran

REFERENCES