Probing with and without Inferior Turbinate Fracture in Congenital Nasolacrimal Duct Obstruction

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ABSTRACT

Congenital nasolacrimal duct obstruction (CNLDO) occurs due to the failure of canalization of nasolacrimal duct usually at the level of the Hasner valve, at the distal end of the duct. Probing of the nasolacrimal duct is generally attempted after a child is more than 1-year-old and is generally quite effective with success rates ranging from 77% to 97% after 1sttime application. Adding infracting of the inferior turbinate to probing had been used to promote success rate of this procedure. In this study we try to evaluate efficacy of this procedure .Methods: In a prospective one side blinded clinical trial CNLDO patients randomly divided in two groups. Primary probing was done in the first group and in the second group probing plus inferior turbinate fracturing was done. Patients were examined by 3 and 6 months later and questioned if the child still has epiphoria. Results: After 3 months primary probing with fracturing inferior turbinate was more successful than primary probing alone, but this difference was not statistically significant. (P: 0.776). After 6 months Primary probing alone was more successful than primary probing with fracturing inferior turbinate, but this difference was not statistically significant. (P: 0.525) Conclusion: Primary probing with fracture of inferior turbinate in compare with simple probing has statistically same success rate.

Key Words: Congenital Nasolacrimal Duct Obstruction, Fracture of the Inferior Turbinate, Probing.

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INTRODUCTION

The nasolacrimal duct starts to develop since the fifth week of embryogenesis. [1] Congenital nasolacrimal duct obstruction (CNLDO) occurs due to the failure of canalization of nasolacrimal duct. [2] The obstruction is usually at the level of the Hasner valve, at the distal end of the duct. [3] CNLDO occurs in up to 70% of neonates at delivery. However, only 6%–20% of all neonates show symptoms, because the obstruction usually resolves spontaneously before lacrimal secretion begins. [4] The main presentation of nasolacrimal obstruction is watering (epiphora) and mucopurulent discharge observed from the first month of life. This usually occurs in only one eye, although both eyes may be affected in up to 20% of cases [5] the treatment of CNLDO includes observation, topical antibiotics with tear duct massage, and surgical interventions ranging from simple probing to more invasive procedures, such as stent intubation and dacryocystorhinostomy. [6, 7] Probing of the nasolacrimal duct is generally attempted after a child is 1-year-old or more that is generally effective with success rates ranging from 77% to 97% after 1sttime application. [8] Nasolacrimal duct probing had a success rate of 58% in patients with complex types of obstruction. [9] Havins and Wilkins for patients with failed initial probing used infracting of the inferior turbinate before reprobing and reported 88% success rate [10].

In this study we try to see if fracturing inferior turbinate can rise up nasolacrimal probing overall success rate.

METHOD

In a prospective one side blinded clinical trial patients of CNLDO presenting with epiphoria from birth or later, who

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had no previous probing, no history of dacrocyctitis and no other anatomical deformities in eyelid or nose, were studied. They were asked a questionnaires' log and were divided in two groups by random (odd & even).

Primary probing was done in the first group (control group). First the punctum was dilated by punctual dilator. Bowman probe was passed vertically then rotated 90 degrees and horizontally was passed through canaliculus while pulling the eyelid laterally. The probe was pushed forward until it touched bone then it was pulled back a little and turned for 90 degrees making it vertical again with slightly tilting to lateral and posterior guiding it to nasolacrimal duct. Probe goes down through the duct and penetrates membranous layer at the of nasolacrimal duct, interring the nose. Using a second probe in the nasal cavity to touch the first one ensuring the procedure was successful. In the second group the same procedure was done and also a blunt edge periosteal elevator was placed under the inferior turbinate and moved it medially to elevate the turbinate from the lateral wall and fracture of the inferior turbinate was done. All the surgeries were done by a single surgeon. The results were evaluated by someone else. Patients were examined by 3 and 6 months later and questioned if the child still has epiphoria.

RESULTS

Sex, age, age of onset, presenting symptom, history of another eye disease, familial history of CNLDO, type of delivery, age of delivery and history of previous surgical procedures in two groups were comparable. Table 1 shows demographic comparison between two groups.

Because of the low incidence of surgical complications in two groups statistical evaluation was not possible (Table 2).

After 3 months primary probing with fracturing inferior turbinate was more successful than primary probing alone but this difference was not statistically significant. (P: 0.776) (Table 3)

After 6 months primary probing alone was more successful than primary probing with fracturing inferior turbinate but this difference was not statistically significant. (P: 0.525) (Table 4)

DISCUSSION

CNLDO occurs due to the failure of canalization of nasolacrimal duct usually at the level of the Hasner valve. The treatment of CNLDO includes observation, topical antibiotics with lacrimal duct massage, and surgical interventions including simple probing stent intubation and dacryocystorhinostomy. Fracture of the inferior turbinate was added to probing to promote success rate. [10] In this study we compare simple probing with probing plus fracture of the inferior turbinate.

After 3 months probing with inferior turbinate fracturing was more successful than primary probing alone, but after 6 months probing alone was more successful than probing with fracturie of the inferior turbinate. But these differences were not statistically significant.

Because of the low incidence of surgical complications of probing with or without fracture of inferior turbinate statistical evaluation of it was not possible.

In Wesely study [11] primary probing with fracturing of the inferior turbinate was done on 52 eyes which were considered high risk since they had been previously probed. In our study primary probing was done on 50 eyes, that 41 eyes were completely successful, 6 eyes were partially successful and 3 eye were not healed, which shows the high success rate of primary probing. In our study primary probing with fracturing inferior turbinate in case group showed the same high success rate as Wesely study showed.

Attarzadeh at 2005 compared success rate of primary probing and probing with inferior turbinate fracture in 86 eyes of 61 children older than 6 months suffered CNLDO and showed that the difference between two groups is not statistically significant [12]. In our study the procedure was done on more eyes, 97 eyes and we also found the difference between two procedure is not significant.

Our study failed to see which procedure cause more complications, it seems a larger number of patients are required to show this. Another drawback of our study is not dividing of groups based on age of patients, by doing so we may see if the procedure is more successful at a certain age. Future studies by focusing on complication and age of children can find if one of these two procedure has less complication or if one of them is more appropriate for a certain age.

CONCLUSION

Primary probing with fracture of inferior turbinate in compare with simple probing has statistically same success rate.

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Table 1: Demographic chart

	Case	Control	P value
Sex	Male 20 (42.6%) Female 27 (57.4%)	Male 27 (54.0%) Female 23 (46.0%)	0.178
Age	18.54	24.06	0.047
Age of onset	At birth 39 (83.0%) Later 8 (17.0%)	At birth 45 (90.0%) Later 5 (10.0%)	0.237
Presentation	Tearing 14 (29.8%) Mucouid 17 (36.2%) Infection 16 (34.0%)	Tearing 20 (40.0%) Mucouid 20 (40.0%) Infection 10 (20.0%)	0.273 0.271 0.129
history of another eye disease	Yes 1 (2.1%) No 46 (97.9%)	Yes 5 (6.2%) No 45 (90.0%)	0.117
Familial history of CNLDO	Yes 3 (6.4%) No 44 (93.8%)	Yes 2 (5.2%) No 48 (96.0%)	0.470
delivery	Cesarean 24 (51.1%) Vaginal 23 (48.9%)	Cesarean 27 (48.9%) Vaginal 23 (46.0%)	0.466
Term or preterm	Term 45 (95.7%) Preterm 2 (4.3%)	Term 47 (94.0) Preterm 3 (6.0%)	0.530
history of previous procedures	Yes 1 (2.1%) No 46 (97.9%)	Yes 1 (2.0%) No 49 (98.0%)	0.737

Table 2: Comparison of complication in two groups

	Complication	No complication
Case	1 (2.1%)	46 (97.9%)
Control	1(2.0%)	49 (2.0%)

Table 3: Comparison of two groups based on result of surgery after 3 months

	Completely successful	Partially successful	Not successful
case	41 (87.2%)	4 (8.5%)	2 (4.3%)
Control	41 (82.0%)	6 (12.0%)	3 (6.0%)

Table 4: Comparison of two groups based on result of surgery after 6 months

	Completely successful	Partially successful	Not successful
case	42 (89.4%)	3 (6.4%)	2(4.3%)
Control	46 (92.0%)	1 (2.0%)	3 (6.0%)

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