

Original Research Article

A non-surgical conservative management of congenital dacryostenosis

Namrata Srivastava¹, P. N. Dwivedi^{2*}, Haleema Sadiya³

¹Department of Optometry, ERA University of Allied Health Science, Lucknow, Uttar Pradesh, India

²Department of Ophthalmology, Satya Eye Hospital and Research Institute, Kanpur, Uttar Pradesh, India

³Department of Optometry, Himalayan Garhwal University, Uttarakhand, India

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*Correspondence:

Dr. P. N. Dwivedi,

E-mail: optometry.cnb@gmail.com

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ABSTRACT

Background: Congenital canaliculus stenosis often occurs in about 25-30% of all new born. In many cases, a narrowing of the Nasolacrimal duct can be seen due to a persistent of Hasner membrane. Conservative treatment begins with lacrimal sac massage in the first month of life. This study was conducted to determine non-surgical conservative treatment for congenital lacrimal stenosis in infants and young children. Study design: prospective observational study. The settings are the “Satya eye hospital and research institute”, Kanpur UP from December 2015 to October 2017.

Methods: Nasal sac massage (Crigler massage) with or without topical antibiotics was recommended for 281 children less than 10 months of age diagnosed with congenital canaliculus stenosis. Resolution of lacrimal stenosis was assessed at 4 and 7 months and was defined as the absence of any clinical signs of NLDO. At 7 months, at visits, 244 eyes (83%) of 281 patients showed conservative treatment.

Results: Conservative treatment of CNLD with Crigler massage was successful in most cases treated in 281 (84%) of 335 eyes with congenital canaliculus stenosis. The remaining 54 (16%) eyes were examined. Age ($p=0.001$) and unilaterality ($p=0.001$) were found to be associated with the loss of clinical signs.

Conclusions: In this study, we conclude that nonsurgical conservative treatment has a high overall success rate for congenital canaliculus stenosis and that this form of treatment can be considered one of the best options in infants and young children.

Keywords: Conservative treatment, Crigler massage, Congenital canaliculus stenosis, Nasolacrimal duct

INTRODUCTION

Congenital dacryostenosis (congenital nasolacrimal duct obstruction or CNLDO) is a common disorder in premature infant causing failure in the nasolacrimal duct drainage system and presenting clinically in the overflow of tears, also called Epiphora which may lead to infection, such as dacryocystitis, Orbital cellulitis and bacterial conjunctivitis.¹ Dacryostenosis; from the Greek word dacryon (Tear) and Stenosis (Narrowing), generally refers to an obstruction that can affect any part of Excretory system of lacrimal Apparatus.² A delay in the

maturation of the lacrimal system where it enters the nose, result in a persistent membranous obstruction at the valve of Hasner is the cause for nasolacrimal duct obstruction in infants. Although most cases of CNLDO resolve spontaneously or in response to Conservative management (i.e., Effective massage of the lacrimal sac according to Crigler and topical antibiotic therapy) in 90% of the first year of life. Crigler first described the nasolacrimal pressure technique for the treatment of congenital obstruction of the nasolacrimal duct in infants.³ Applying gentle pressure to the nasolacrimal duct increases the hydrostatic pressure of the nasopharynx

system, rupturing the membrane blockage at the end of the nasolacrimal duct, which helps in resolution. This technique is called Crigler massage.⁴

Usually available treatment options are conservative therapy, including observational, lacrimal sac massage and antibiotics, and invasive therapy. Observation, combined with conservative options, seems to be the best option in infants aged <1 year. Therefore, patient with unresponsive to Conservative treatment or presenting with chronic or recurrent bacterial conjunctivitis, in order to prevent dacryocystitis, in such cases the standard of care is early probing performed under topical anaesthesia, even though there is no clear consensus on optimal timing of surgery. The overall success rate of primary probing in CNLDO is high. Cases unresponsive to the initial surgery may benefit from second probing DCR intubation, Balloon catheter dilation, dacryocystorhinostomy or a combination of procedure, with variable outcome. The purpose of this study was to evaluate the incidence of congenital canalicular stenosis with conservative treatment including Crigler massage and topical antibiotics.

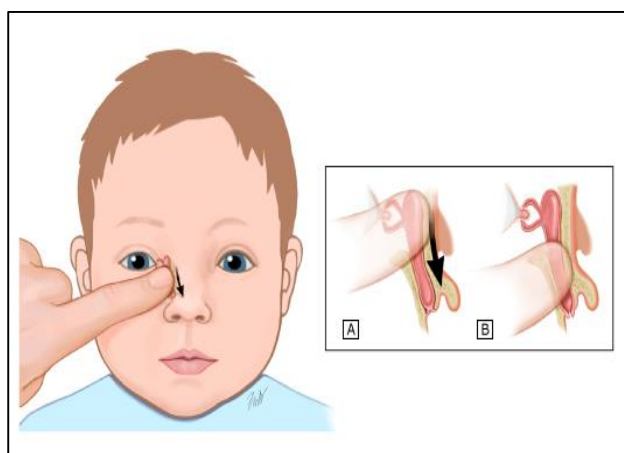


Figure 1: Technique for nasolacrimal duct (NLD) massage in infants and children with congenital NLD obstruction (dacryostenosis) crigler massage, A) The index finger is placed over the superior aspect of the nasolacrimal sac and moderate pressure is applied downward, B) Downward pressure causes rupture of the membranous obstruction at the bottom of then Nasolacrimal duct.

METHODS

This prospective study was conducted for about 2 years (December 2015 to October 2017) at the department of ophthalmology and research institute of Satya Eye Hospital. The study protocol was approved by the institute.

Inclusion criteria

Inclusion criteria were patients with a history of tears, a positive reflux test, and grade 2 or 3 DDT. The McEwan DDT rating scale was used in our study.

Exclusion criteria

Exclusion criteria were patients with excessive tearing due to reflex tearing secondary to conjunctivitis, intraocular inflammation, endophthalmitis, entropion or ectropion, and congenital glaucoma. This criterion was assessed by the same physician at the time of the first examination. In most cases, congenital lacrimal stenosis resolves without surgery.⁵ Of the 281 conservative infants (335 eyes) who participated in the study, 127 (45.3%) were boys and 154 (54.7%) were girls. Parents of new born were instructed to massage the nasolacrimal duct (gently pressing for 2 to 3 seconds on the lacrimal sac 2 to 3 times a day), which was demonstrated in the clinic itself. Tobramycin sulphate 0.3% eye drops may be applied 3 times a day if mucopurulent discharge is present or an antibacterial ointment may be prescribed to avoid infection. Follow-up examinations to evaluate results were performed at 4 and 7 months after study entry.⁶ In cases that did not occur within one-month, nasolacrimal duct probing was performed under general anesthesia. Statistical analysis was performed using the chi-square test, and it was considered statistically significant when the p value was less than 0.05.

Statistical analysis

The Statistical methods for qualitative data percentage were put in a graphical manner. The statistical analysis was done by using the software, SPSS (Version 16.0). The test was used to compare in two groups with std. and oil massage Crigler's method, p value >0.05 was considered significant. Local Antibiotic: Antibiotic eye drops are sometimes used with conservative CNLDO therapy. The bacterial flora of the conjunctiva of CNLDO patients is approximately the same as that of the normal population, and the use of antibiotic eye drops may induce the bacterial flora to be less capable of eliminating resistant bacteria. Therefore, no antibiotic eye drops are necessary in conservative treatment of pure CNLDO. However, for conjunctivitis co-occurring with CNLDO, antibiotics in the form of eye drops are recommended.

RESULTS

Male students, 127 (45.3%) and 154 Female students (54.7%), total 281 patients, 335 eyes were included in the study. At the time of the first visit, the age ranged from 2 to 10 months, and the average age was 5.5 months. CNLDO was unilateral in 197 (70%) neonates and bilateral in 84 (30%). The right eye was affected in 131 infants and the left eye in 66 infants. Prior to inclusion in this study, 215 children (76.8%) were treated with lacrimal sac massage and/or topical antibiotics. Nine patients required surgery during the study period. A total of 272 patients (97%) completed the first transplant at 4 months, and conservative treatment was possible in 168 (51%) of 329 eyes (p=0.000). Conservative therapy, such as observation, lacrimal sac massage, and antibiotics, as well as invasive therapy are available as treatments. With new born under 1 year old, observation along with conservative measures

appears to be the optimum course of action. Similarly, 239 (85%) children completed 6-7 months and 244 of 295 (83%) eyes resolved completely ($p=0.003$).

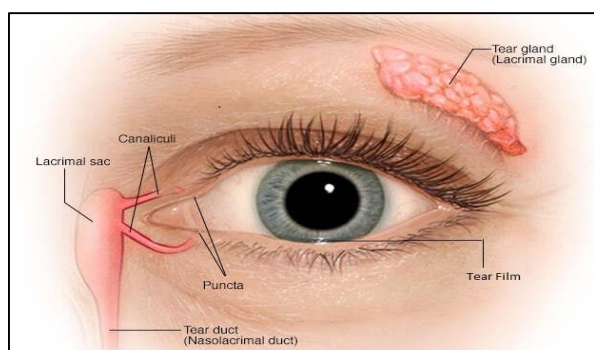


Figure 2: The tear glands (lacrimal glands), located above each eyeball, continuously supply tear fluid that's wiped across the surface of your eye each time you blink your eyes. Excess fluid drains through the tear ducts into the nose.

Table 1: Resolution of nasolacrimal duct obstruction with non-surgical conservative management.

Congenital Nasolacrimal duct obstruction (CNLDO)	4 month follow up N (%)	7 month follow up N (%)
Children with unilateral NLDO (N=197) resolved		
Total participants	137 (71)	128 (89)
Children with Bilateral NLDO (N=84)		
Both resolved	25 (30)	48 (57)
One eye resolved	13 (15)	6 (7)
Neither eye resolved	47 (56)	9 (11)
Total participants	84 (100)	71 (100)
All eyes (N=335) Resolved	169 (51)	246 (83)
	($p=0.000$)	($p=0.003$)
Total participants	329 (100)	295 (100)

Table 2: Resolution of CNLDO with other variables.

Variables	Eye	Resolved	P value
Gender			
Male	122	105	0.684
Female	150	124	
Laterality			
Unilateral	188	168	0.001
Bilateral	84	61	
Symptoms			
Epiphora	98	89	0.062
Mucopurulent discharge	44	39	
Both	130	101	
Prior treatment			
Sac massage and antibiotics	99	77	0.062
Antibiotic Only	107	92	
NO Treatment	66	60	

Of the 84 children with bilateral NLDO, 48 children (57%) had resolution in both eyes by the end of 7 months. The resolution was found to be much higher with unidirectional CNLDO ($p=0.001$). Gender ($p=0.684$), symptoms ($p=0.062$), previous treatment ($p=0.062$).

Differences according to the frequency of disappearance according to conservative treatment (Table 2).

The resolution was found to be much higher with unidirectional CNLDO ($p=0.001$). Gender ($p=0.684$), symptoms ($p=0.062$), previous treatment ($p=0.062$) Differences according to the frequency of disappearance according to conservative treatment of the 70 eyes of 49 children who missed vaporization at 7 months, 9 developed acute dacryocystitis and underwent surgery for this condition.

The remaining 21 children lost strength before the end of 7 months. Resolution of Nasolacrimal duct obstruction was assessed at 4 and 7 months and was defined as the absence of any clinical signs of Nasolacrimal duct obstruction.

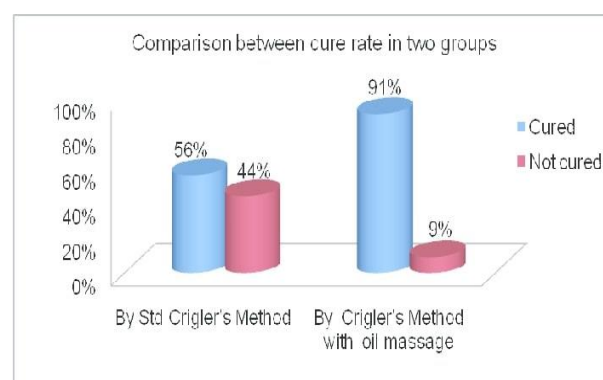


Figure 3: Crigler's massage method with std. & oil method in congenital dacryostenosis.

Treatment of congenital nasolacrimal duct obstruction

- one third: bilateral
- Rule out congenital glaucoma
- Massage of nasolacrimal duct: 10 strokes 4 times a day
- antibiotic drops 4 times daily: if discharge
- Improvement by age 12 months in 95% of cases

- If no improvement- probe at 12 months
- Results - 90% cure by first probing
- 6% by repeated probing

Figure 4: Lacrimal sac massage efficient in congenital nasolacrimal duct obstruction (CNLDO).

Successful dacryostenosis massage was more common in unilateral than in bilateral CNLDO i.e. ($\chi^2=10.45$; $DF=1$; $p=0.001$). Use "static pressure" as described in Crigler's massage therapy.^{7,8} They found that the massage technique was more effective for children younger than 2 months of age, but also effective for children as young as 1 year old. There was no non-massage control group, but antibiotics for CNLDO should only be used in the treatment of children with active infection and mucous discharge. Prophylactic antibiotic use did not show any improvement in outcomes in patients with CNLDO. Crigler massage was recommended to all parents for 1-3 months, with hands-on demonstration, and results were recorded every 2 weeks. However, this approach is recommended for all infants with CNLDO at their first visit, even after 6 to 7 months of age. The procedure can be safely and successfully repeated. Our study provided a possible objective explanation for the effectiveness of lacrimal sac massage. If you emphasize the importance of massage to your parents and explain it in detail, you can reduce the risk of unnecessary surgery.

DISCUSSION

Conservative therapy with lacrimal sac massage is the first choice for newly diagnosed cases of CLDO. According to the literature, the effectiveness of Crigler massage ranges from 82.9% to 94.7%. Complete degradation of NLDO was achieved with a waiting time of 7 months in 83% of the eyes treated conservatively in this study. The effectiveness of Crigler massage was studied in consecutive patients with clinical signs of CNLD. The overall success rate of conservative treatment was 68.9%. In another study, the spontaneous cure rate of CNLDO with conservative treatment was 94.6% (1947, price), 94.72% reported by Nelson et al, before 13 months 89% reported by Petersen et al before 16 months 89% reported by Paul et al, 96% reported by McEwen et al and 80% reported by Pits et al and Noda et al reported that CNLDO in Japanese infants resolved with conservative treatment at 9 to 10 months of age.¹⁰⁻¹⁶ By the end of 4 months of follow, more than half (51%) of CNLDO resolution was observed. However, most have been resolved within the last 6-7 months. In bilateral CNLDO, resolution occurred concurrently with or within 4 months of contralateral resolution, similar to Nelson and Kaki's report.^{17,18} Dacryostenosis massage is commonly performed as the main method of conservative treatment of NLDO. Simultaneous probing as a first Dacryostenosis-line treatment for CNLDO in various studies is because long-term inflammation promotes fibrosis at the site of obstruction, which subsequently reduces cure rates. Initial probing resolution was 78-100% during the first 12 months of life. As shown in this study, conservative treatment and recovery rates did not differ. The duration of conservative treatment should be considered taking into account the severity of the disease and the risk of complications in case of an untimely examination. Congenital obstruction of the Nasolacrimal duct is usually unilateral in bilateral cases, symptoms are

usually asymmetrical. However, parents feel proud when their child's Nasolacrimal duct is resolved without surgery. All national and international studies of Crigler massage have a unanimous recommendation that conservative treatment of CNLDO should be the first option, with varying results.

CONCLUSION

Congenital obstruction of the Nasolacrimal duct, when performed consistently, has mostly resolved with a conservative approach with Crigler massage as initial treatment. Probing and other surgical procedures should not be considered before 12 months of age. The non-surgical Crigler massage treatment has been very effective. Factors influencing the success of this procedure were the patient's age and the unilaterality of the disease. In light of the study, we believe that conservative treatment with CNLDO is very successful. Our study provided a possible objective explanation for the effectiveness of lacrimal sac massage. This study showed that 83% of CNLDO resolved with conservative treatment. Based on these studies, we recommend that lacrimal sac massage be effective in treating obstruction of the nasolacrimal duct in infants and young children. If you emphasize the importance of massage to your parents and explain it in detail, you can reduce the risk of unnecessary surgery. Therefore, this study concludes that conservative treatment for congenital nasolacrimal duct obstruction produces good results in early infancy. Parents should receive appropriate technical training.

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