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Review Article

Treatment management of congenital nasolacrimal duct atresia: A review article

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ABSTRACT

A atresia of nasolacrimal duct which is congenital in nature causing lacrimation and mucous secretion from the eyes. Nasolacrimal duct atresia is the most common disorder of newborns showing symptoms of this condition around 6 to 20 percent. Generally symptoms shows after birth within few weeks with excessive tears and discharge from eye which may be present in single or both eye. Both upper and lower eyelids redness may result due to irritation by tears and eye discharge. Due to this condition it presents like a chronic unilateral or bilateral conjunctivitis.
Observation and conservative treatment is the best treatment in infants and nasolacrimal probing is the best treatment option for children above one year of age. But the timing for probing is still under debatable. Other surgical invasive methods like intubation of silicon tube, dilation by balloon catheter and (DCR) dacryocystorhinostomy.
So aim of this review study is provide an update on congenital NLD Atresia treatment.

1. Introduction

A atresia of nasolacrimal duct is a common condition in newborns and infants, clinically it present in the form of excessive tears, means epiphora[1] the prevalence is 05% to 20% in children according to epidemiological studies report.[2,3] MacEwen et al. found too much lacrimation in 95% of neonatal age group and approximately 20% after the neonatal period of infants.[3] The point where the nasolacrimal duct enters into the nose is a place of obstruction[valve of Hasner] and the causes are presence of membrane, bone defect and inferior meatus stenosis.[4,5] The nasolacrimal apparatus and drainage system develop in the last three months of pregnancy which causes higher percentage of excessive lacrimation in premature baby.[6] It presents clinically in the form of ocular mattering and tearing. Other causes of epiphora are infantile glaucoma, foreign body, corneal infections[7] and conjunctival bacterial infection[1,8] should be ruled out. A percentage of anisometropic amblyopia found in children with CLND obstruction (10–12%) is high.[7,9] Maximum number of congenital NLD atresia cases are naturally resolve in their first year of life[10–14] and, in some cases, this disorder may present after the one year of age, so, more update protocol for the treatment management of congenital nasolacrimal duct atresia are needed.

2. Observation

The conservative approach is wait and watch policy with proper lacrimal sac massage, and use of antibiotic eye drops topically when a bacterial infection occurs. So many studies

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shows by the age of 13 month spontaneous resolution from 32% to 95%.[11–15] Most of the studies explain spontaneous resolution rates are 80–90% in the first three months, 68–75% in second and finally 36–57% in the third[3,12,14] trimester of life. Nelson et al. described resolution rate of 93% with conservative management in children aged 8 months or less.[10]

Similarly, Noda et al. Japanese infants are managed with a conservative approach up to the age of nine months.[14] But, self resolution of atresia still occurred after the first year of life;[11,16] in continuation Young et al. Stated that atresia resolve between 1 to 2 year of life in 44% of the children.[17] Bilateral atresia reported in 14–33.8% cases, which also resolved within the 3 months of age.[18]

2.1. Massage of lacrimal sac

The sac massage is a widely accepted conservative treatment method. In continuation of A randomized prospective trial of Kushner shows the efficacy of a simple massage in relation with no massage at all.[19] Though some studies have questioned the clinical effect of this method,[20,21] a new recent study of Stolovitch et al. showed a success ratio of 56% in children upto 2 months, 46% in children between 2 to 6 month, and 28% in children above 6 months of age.[22]

IN continuation, a recent study gives a statistical difference of resolution rate in infants with lacrimal sac massage and those did not received massage (96.2% vs. 77.7%, p = 0.001.[23] These results shows the Crigler maneuver [lacrimal sac massage] importance. Ultimately, a simple observation with correct massage of sac is the first-line treatment in congenital NLD atresia up to the age of one year. The antibiotic role is not established in noninfective CNLD atresia. Several studies already states that there is no advantage of antibiotic drops with conservative treatement in simple atresia.[12,24–26] Moreover, for controlling the local spread of an infection an use of antibiotic drop may be helpful.[27,28]

In conclusion, most of the articles shows that the antibiotic therapy was used only when the clinical evidence of infection was present. Invasive treatment is also there in the form of NLD dilatation and surgery. The first-line of invasive treatment consists of irrigation with probing and other methods include repeated probing, silicone tube intubation and balloon dilatation of the lacrimal apparatus. The most common surgical treatment is probing in the children of congenital nasolacrimal duct atresia.[16,17,29–34] Evidence shows that resolution rate of congenital nasolacrimal duct atresia in children below 12 months who underwent primary early probing under topical anesthesia, ranges from 75% to 89%, in comparison to children who are older than 12 months. It means a success rate is more in primary late probing in comparison with early probing[35–38]. In continuation, several articles claims better results in affected children above one year.[39–41] In sequence, Rajabi et al. claim rewarding results in 75.8%, specifically 85% in 2 to 3 years, 63% in 3 to 4 years, and 50% in 4 to 5 years of age group.[42] Napier et al. claim A 76% of success rate in primary probing as a first-line intervention having no relation of gender, age and type of obstruction.[43].

The conservative treatment which is safe and effective in the most of the children and comparable results found in older than 12 months by late probing, so it acts as a reasonable second-line treatment strategy.

The clinical efficacy of other surgical interventions has been studied by Several studies. The placement of a silicone tube stent in canaliculi by nasolacrimal intubation in one or both nasal canaliculi is method of nasolacrimal intubation[14,44] generally tubes are left in situ for a period of 2 to 6 months.

The nasolacrimal intubation having good results with some complications, but still, it should be regarded more in effective second-line management strategy.[18,45–47]

For reducing the probing-induced complications[48,49] the nasolacrimal duct dilate by the balloon catheter inflation.

If all these procedures have no results, means there are some problem in the form of bony obstruction, dacryocystitis, and dacryocystocele. Dacryocystorhinostomy is surgical procedure of choice[50,51] but recent endoscopic technique having better success rate and decreased postoperative complications by external surgical approach.[52,53]

3. Conclusions

A relatively common condition in the pediatric population (5–20% is Congenital nasolcrimal duct atresia.

Two third of children having congenital NLD atresia below the one year of age can be managed successfully by conservative medical treatment with high success rate.

Training of parents should be proper for performing a correct lacrimal sac massage [Crigler maneuver] 4-5 times a day which increases the spontaneous resolution chances. Due to the possibility of spontaneous resolution after first year, a invasive treatment should be performed after the age of 15 to 18 months age.

Conversely, due to lack of proof in support of antibiotic therapy in congenital nasolacrimal duct atresia treatment so antibiotics should be restricted only for the infective cases.

Early probing and late probing having comparable results, so it can be postponed for first year of life and considered for better results within 2-3 years of age. More specifically the first-line invasive treatment is probing. For that the conservative approach for treatment of congenital nasolacrimal duct atresia should be postponed as long as possible and invasive method should be considered when the conservative treatment method fails. In some cases where the probing methods fails second line of

surgical management can be opted such as balloon catheter intubation and endoscopic dacryocystorhinostomy. These second line method are advanced surgical method.

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5. Conflict of Interest

None.

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