ORIGINAL RESEARCH PAPER

Ophthalomology

CONGENITAL NASOLACRIMAL DUCT OBSTRUCTION AND ITS MANAGEMENT PROTOCOL

KEY WORDS:

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ABSTRACT

PURPOSE: To determine management protocol in congenital nasolacrimal duct obstruction in age group of 3 months to 6 yrs . **METHOD:** A prospective interventional study was conducted on 30 patients with CNLDO within the age group 3 months to 6 yrs from September 2020 to April 2022. The diagnosis was made based on a history of epiphora since birth, or shortly after birth, in one or both eyes supported by objective evidence of reduced lacrimal outflow using a fluorescein dye disappearance test (FDDT). Ocular examination was carried out to exclude punctal stenosis or other abnormality. Patients with positive FDDT test were considered for various treatment modalities. Patients with age < 1 year considered for criggler massage 8-10 times a day. Patients with persistent epiphora and mucous discharge were considered for endoscopic assisted probing or DCR with intubation under general anaesthesia. **RESULTS:** The study group comprised of 30 patients, out of which 40 % were male and 60 % were female. On the basis of age of representation 60 % were between 12 months, 26 % between 1 year – 4 year and 14 % more than 4 years. In this study all patients were prescribed crigler massage but the patients not improved on massage and, 12 months - 4 years and more than 4 years were prescribed with endoscopic assisted probing, and DCR with intubation respectively. In this study out of 30 patients of CNLDO 16 patients were improved by crigler massage (in age group of < 12 months) ,9 patients were improved with endoscopy assisted probing with 90 % of successful result in age group of 12 months - 4 years and 5 patients improved from DCR with intubation depending upon age of patients . **CONCLUSION-** CNLDO is a relative common disorder in peadiatric population (5 - 20 %) due to failure of canalisation of the distal end of nasolacrimal duct leading to watery and mucoid discharge. Conservative management in the form of crigler massage considered to be safest and effective with higher success rate. Patients with no improvement on crigler massage and persistence of symptoms shows more effective outcome with endoscopic assisted probing or DCR with intubation.

INTRODUCTION:

Congenital obstruction of the nasolacrimal duct (NLD) is one of the most common ocular disorders in infants with an estimated prevalence of 20%.[1] The principal etiology behind CNLDO is obstructive membrane within the NLD at the level of the valve of Hasner or more proximal that undergoes delayed involution.It may also occur due to bone abnormalities, or a stenosis of the inferior meatus leading to a narrowing in congenital nasolacrimal duct obstruction.[2]In a study by Tavakoli et al shows higher prevalence of CNLDO in premature children.[3]

The child presents with the clinicial feature of tearing and/or mattering of the involved eye. The conjunctiva usually shows no sign of infection which helps to differentiate nasolacrimal duct obstruction from a viral or bacterial conjunctivitis. Infants presenting with history as noted above is often sufficient to make the diagnosis.[4] However, diagnosis is confirmed by the fluorescein dye disappearance test .[5]

There are two types of CNLDO : Simple and Complex CNLDO. Simple CNLDO is defined as a membranous obstruction at the lower end of the nasolacrimal duct (NLD) that is overcome without any resistance. Any other type of NLD obstructions; eg, variations of NLD or or a buried probe, impacted inferior turbinate, a firm bony obstruction, nondevelopment of nasolacrimal duct, anlages, or those associated with syndromes or a craniofacial abnormality are considered to be complex.[6,7,8]

There are different treatment modalities present for the patients of CNLDO which can help to resolve the symptoms like criggler massage,endoscopic assisted probing or DCR with intubation.

METHOD:

This is a prospective interventional study conducted on 30 patients with CNLDO in September 2020 to April 2022 .Patient presenting with symptom of excessive watering from one or both eye were included in our study and considered for ocular examination . The diagnosis of CNLDO was based on a history of epiphora and/or discharge since birth, and confirmed roplas test and abnormal fluorescein dye disappearance test (FDDT).In Roplas test we follow the infraorbital rim to reach up to anterior lacrimal crest and then press just medially and posteriorly so that the sac gets pressed. In FDDT Fluorescein mixed with topical anesthetic is placed into the lower conjunctival fornix of each eye and excess solution and tears were blotted with a tissue. After 5 minutes the child were examined. Positive test showed residual dye in conjuctival sac when seen in cobalt blue filter. Patients with secondary cause of tearing like glaucoma, eyelid abnormality ,ocular surface diseases, history of any nasolacrimal surgeries ,metabolic disorder or craniofacial abnormalities are not included in study. Patients age less than 12 months diagnosed were advised criggler massage .The children were divide into 3 groups on the basis of age that is age less than 12 months ,12 months to 6 years and more than 6 years were manages with criggler massage ,endoscopic assisted probing and DCR with intubation respectively .In children when any hard resistance or obstruction felt on endoscopic assisted probing were then planned for DCR with intubation. Endoscopic assisted probing or DCR with intubation are the treatment options for the patients refractory on conservative management and patients aged between 18month -6 year or more.

CRIGGLER MASSAGE:

The technique involved placing one finger over the common canaliculus to block upward flow and then stroking downward along the lacrimal sac to increase hydrostatic pressure and attempt to break a membrane at

the opening of the nasolacrimal duct into the nose.

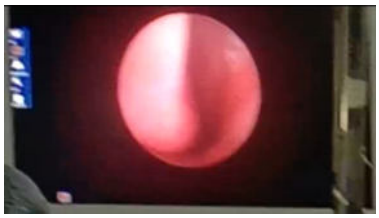
Endoscopic assisted probing technique:

The nasal endoscopic-assisted probing was carried out under general anesthesia. Preoperatively topical decongestant nasal drops (xylometazoline hydrochloride, 0.025%) was usually instilled in the nasal cavity . This improves visualization as it constricts the vascular nasal mucosa. Under general anesthesia, a nasal pack soaked in 0.025% xylometazoline hydrochloride inserted under the inferior turbinate and between the inferior turbinate and the nasal septum for 5–10 min and then removed. After the removal of the nasal pack, nasal cavity is examine for any pre-existing pathology. A 2.7 mm 30 rigid endoscope was used . After adjusting white balance and an antifog solution was applied, the endoscope was introduced into the nasal cavity. During the pass of the endoscope, the structures of the nasal cavity, the appearance of the nasal mucosa, and the inferior turbinate were examined. The endoscope was passed along the floor of the nasal cavity while examining the inferior meatus where the NLD drains. The NLD drains into the nasal cavity via the valve of Hasner, which can be identified as a small dimple in the mucosa of the lateral wall of the inferior meatus.

DCR WITH INTUBATION TECHNIQUE:

DCR with intubation was the procedure carried in general anaesthesia. Nasal cavity of operated side was packed with 4% lidocaine and adrenaline.The skin was incised and blunt dissection performed until periosteum of maxilla was identified. With the help of elevator , periosteum over anterior lacrimal crest and into the lacrimal fossa was elevated, dissection is extended furthure by elevating the lacrimal sac and exposing the lacrimal bone. A kerrison bone punch is used to create the ostium .Nasal mucosa and lacrimal sac was incised and anterior flaps was made. Insertion of bicanalicular silicone tube was performed and then passed to nose.The anterior nasal mucosal flaps and lacrimal sac flaps were sutured with 4-0 vicryl.The incision was then closed in two layer fashion, inner with 4-0 catgut and outer via 6-0 nylone in interrupted way. Patient was then followed up at 1 week, 6 week and 3 months.

Post operatively in case of probing and DCR with intubation patients were prescribed with systemic and topical antibiotics. In DCR with intubation skin sutures removed after 1 week and stent removal after 6 weeks. Success were defined as complete resolution of previous signs and symptoms . A normal dye disappearance test confirmed success[9].



Endoscopic assisted probing

RESULT:

Total 30 patients diagnosed positively with Cnldo after perfoming FDDT test were included in the study. Most of the patients were in age group less than 6 months 40 %.

TABLE-1 Gender wise distribution

Male	Female
12	18

TABLE-2 Age wise distribution

Age	No. of cases	Percentage(%)
Less than 1 year	18	60
1yr -6 year	8	26
More than 6 year	4	14

TABLE–3 Clinical profile

Perinatal history		
Full term delivery	21	70
Preterm delivery	9	30
Normal vaginal delivery	18	60
LSCS	12	40
Laterality		
Unilateral	26	86
Bilateral	4	14
Right eye	12	40
Left eye	18	60
Ocular symptomatology		
Epiphora	22	72
Epiphora with discharge	8	28
Conjunctival chemosis	0	
Ocular signs		
Punctal stenosis	0	
Swelling over sac area	8	26
ROPLAS test	28	94

Treatment outcome

Procedures	No. of cases	Outcome	Percentage
Sac massage	18	Success-16 Failure-2	90%
Endoscopic assisted probing	8 + 2 (failure of sac massage)	Success-9 Failure-1	90
Dcr with intubation	4+ 1 (failure on probing)	Success-5 Failure-0	100

Discussion:

The results of this study show that the patients with age less than 12 months has an excellent prognosis with criggler massage . However , patients with persistence of symptoms and failure on conservative management shows higher success rate on endoscopic assisted probing or DCR with intubation. In a study by Crigler reported a 100% success rate with his massage technique during a seven-year period. In a series of 203 cases of congenital nasolacrimal duct obstruction, a 94.6% cure rate by 1 year of age was reported .[10]In another study by Pollard found that 41 of 100 children with a nasolacrimal duct obstruction who were followed conservatively in the first six months of life resolved.[11] In our series out of 30 patients 16 patients shows improvement with crigler massage with a success rate of 90 %. However, patients not improving with criggler massage are planned for endoscopic assisted probing or DCR with intubation according to age of patient and persistance of symtoms .

In a study by C J MacEwen of 40 children (52 nasolacrimal ducts) who underwent endonasal probing. Overall, the cure rate was 85%, although the site and nature of the obstruction had a bearing on the outcome of the procedure. The mean age at presentation was 32

months (10–89 months) and at probing was 34 months (range 12–91 months). There were 22 females and 18 males. There were 10 left, 18 right, and 12 bilateral cases. Three children had previously been probed in a conventional manner without success (one of these on two occasions).[12]In our study mean age of presentation is 12-18 months. In our study there is 12 male and 18 female children. Patients with unilateral involvement is 26 and 4 is bilateral with 12 patient had right eye involved and 18 had left eye involvement . . Patient underwent endoscopic assisted probing is 10 . Success rate is 90% of endoscopic assisted probing in our study. Higher success rate of endoscopic assisted probing is because it is done under direct visualization.The advantage of endoscopic probing is to decrease the chances of false passage and decrease failure rate. Failure on endoscopic assited probing is considered when there is hard resistance or obstruction during probing. Such cases were than planned for DCR with intubation. DCR with intubation is considered to be reasonable approach in older children with CNLDO and after failure of conservative management and probing .

Pandya, et al., [12] in a retrospective study, reviewed 338 external DCR surgeries and found that silicone intubation for longer than 6 months increased the success rate of the procedure Pandya, et al., [12] in a retrospective study, reviewed 338 external DCR surgeries and found that silicone intubation for longer than 6 months increased the success rate of the procedure In a study by Pandya et al , in a retrospective study reviewed 338 external dcr surgeries and found that silicon intubation for longer than 6 months increased the success of procedure. Allen et al showed rise in failure of rate of primary DCR with versus without silicone intubation of naso lacrimal system in 242 consecutive Dcr surgeries. . In our study 5 patients at age more than 4 years and failed with sac massage and endoscopic assisted probing is treated with DCR with intubation with 100% of success rate. Although the success rate of DCR with tubes is high, there have been some reports of increased failure and complication rates associated with silicone tubing[12,13].But in our study no post operative complication were noted.

Postoperative antibiotic eyedrops and ointments were prescribed to reduce infection. Patients were called for follow up on 1 week 6 week and 3 month. Roplas test and FDDT test is carried out to see if there is persistance of symptoms . Success is defined as no sign and symptom of epiphora.

CONCLUSION:

CNLDO is a relative common disorder in peadiatric population (5-20%) due to failure of canalisation of the distal end of nasolacrimal duct leading to watery and mucoid discharge. Conservative management in the form of crigler massage considered to be safest and effective with higher success rate. Patients with no improvement on crigler massage and persistence of symptoms shows more effective outcome with endoscopic assisted probing or dcr with intubation. Endoscopic assisted probing considered to have higher success rate than conventional probing because it allows direct visualization of site and nature of obstruction can be evaluated and decrease the chances of false passage formation.

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