Congenital Nasolacrimal Duct Obstruction

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Anxious parents bring a child with constant tearing from eyes either unilaterally or bilaterally frequenty with mucopurulent discharge . sometimes they have multiple prescriptions authentically their dissatisfaction with the treatment by various ophthalmologist .so what is the rational of treatment for these worried parents?

Epiphora since birth is usually due to congenital nasolacrimal duct obstruction at the lower end of the duct due to noncanalisation.In ONE THIRD OF CASES it is bilateral.Nearly 90% resolve with first twelve month of life. therefore conservative management is preferred till the celebration of first birthday.

Before emphasizing the congenital nasolacrimal duct obstruction it is important to understand the lacrimal drainage anatomy ,embryological development and natural course this condition for appropriate diagnosis and management.

ANATOMY OF NASOLACRIMAL DUCT

It is the continuation of the neck of the lacrimal sac to the inferior meatus of the nose. It is directed downwards, backwards and laterally.the upper opening is the narrowest part and the lower opening is about 30-40mm from the anterior nares. It is 18mm in length and 3mm in diameter.

Two parts (i)intraosseus part (12.5mm)

(ii) intrameatal part(5.5mm)

Intraosseus part lies in the body of the nasolacrimal canal and intrameatal part lies within the mucous membrane of the lateral wall of the nose. At the lower end of the nasolacrimal duct a fold of mucous membrane is present known as the valve of Hasner.

HISTOLOGY

1. Epithelium: 2 layers , superficial is non-ciliated columnar and deep is flattened cells.
2. Subepithelial tissue contains lymphocytes.
3. Fibroelastic tissue
4. Plexus of vessels.

BLOOD SUPPLY

Superior and inferior palpebral arteries and angular and infraorbital arteries.

VENOUS DRAINAGE

Into angular vein and infraorbital vein

LYMPHATIC DRAINAGE

To submandibular and deep cervical nodes.

NERVE SUPPLY

By infratrochlear and anterior superior alveolar nerves.

DEVELOPMENT

The development of the lacrimal drainage system begins at the 3rd to 5th week of intrauterine life. This develops along the line of the cleft between the maxillary and lateral nasal processes. Here an ectodermal fold extends into the underlying mesenchyma and forms a solid cord of cells between the medial canthus and the nasal cavity. Canalisation of the ectodermal cord begins in the third month of intrauterine life at the medial canthus. Canalisation progresses towards the eyelid margin and towards the inner meatus.

Communication between the lacrimal drainage system and the nose occurs at the end of 6 months. The lacrimal puncta opens into the lid margin during the 7th month before lid separates. The tear duct opening into the nose below the inferior turbinate does not become patent until birth or shortly after birth.

Blockage of the nasolacrimal system typically occurs in the distal portion where the tear duct opens into the nose. Tears are normally produced a few weeks after birth, hence NLD obstruction may not be recognised until several weeks after birth.

CAUSES

Most commonly due to the presence of a membrane

at the level of valve of Hasner which is present at the opening of the NLD. Other causes include congenital atresis of NLD, congenital NLD mucocele, congenital absence of valve, absence or atresis of canaliculi and puncta and facial cleft anomalies.

EPIDEMIOLOGY

Occurs in upto 20% newborn, causing symptoms in 6% infants. The majority of cases (96%) usually resolve by the age of 1year.

APPROACH
HISTORY

Parents usually give a history of unilateral or bilateral tearing.other symptoms include crusting mucoid, mucopurulent discharge and redness.the lashes may stick together in the morning.Tearing may be aggravated by upper respiratory tract infection or exposure to wind and cold.important questions include

What is the frequency of symptom? Are the symptom constant or intermittent? Is the tearing only present when the child has upper respiratory tract infection or it is aggravated in cold or wind? At what age did the symptom actually appear? If the child developed symptoms later in life it is unlikely to be a non patent valve of hasner.was the child full term? Are there any associated congenital anomalies such as goldenhars syndrome ,crouzons syndrome or with hypoplastic maxilla such as Treachen-colliins syndrome?is there any history of nasal or sinus surgery?is there any history of photophobia?phptophobia is indicative of possible congenital glaucoma or ocular surface disease

EXAMINATION

Any obvious crusting,redness,or swelling of the lid noted.the tear meniscus may be higher in the eye with CNLDO.lid malposition like ectropion ,entropion should be observed.puncta should be inspected to rule out stenosis.corneal clarity should be evaluated and corneal diameter is measured.

Pressure over the lacrimal sac may discharge mucopurelent material into lacrimal lake and is confirmatory.a dye disappearance test can be performed.after instilling a topical anaesthetic a drop of 2% fluorescein dye is instilled into the conjuctival cul-de -sac .excess fluorescein is wiped away. After 5min the are inspected for residual fluorescein dye with the cobalt blue filter on the slit lamp.failure to clear away the excess fluorescein is indicative of CNLDO

D/D

Other causes of tearing include

Congenital glaucoma,lid abnormality like entropion and epiblepharon,lash abnormality like trichiasis and districhiasis corneal surface abnormality and conjuctivitis or keratisis

MANAGEMENT

1) OBSERVATION AND MASSAGE

This is the first line of management before probing. After cutting nails and washing hands the index and little finger is placed over the common canaliculus to prevent regurgitation and finger is stroked downward firmly to increase hydrostatic pressure within the lacrimal sac and the nasolacrimal duct. About 10 strokes should be performed 2-4 times daily. The aim is to increase the hydrostatic pressure to rupture any membranous obstr uction,it also empties the sac of stagnant tears. If there is mucopurulent discharge vancomycin or ciprofloxacin is advised. 80-95% of children get cured by 1yr of age. It is ideal to take a swab and send for microbiological examination. Common organisms isolated include hemophilus influenza, staphylococcus aureus, pneumococcus and beta-hemolytic streptococcus species.

2) PROBING

A) Probing is done under GA. Controversy exists about the timing of probing. Conservative management by massage can be done safely upto 1yr of age (because 96% will resolve within first 1year of life). The success of probing falls after 1yr of age. Success ranges between 92-97% if done before 1yr of age but falls to 55-85% beyond 1yr of age. Early probing

If the child is very symptomatic, repeated episodes of acute dacryocystitis or in addition any intraocular surgical intervention is necessary, early probing is advised. Early probing prevents occurrence of fibrosis, avoids complications like infection and orbital cellulitis.

B) Difficult probing

It is encountered if there is false passage or if there is a slight bony obstruction.

This can be (1) graduated or stepwise probing(where

probes of progressively increasing diameter are used (2) Reaming (where the probe is forced in a screwing fashion to enlarge the NLD)

C) Repeat probing

Probing is unsuccessful in 5-10% of cases. So it is preferably done after 6weeks if symptoms persist. Prognosis for probing decreases with increasing number of probing and the age of the patient. Rarely it is successful after the 3rd time or after 3years of life.

Contraindication : in acute phase of dacryocystitis.

3) SILICON TUBE INTUBATION

(i) children who are older and have a tight obstruction

(ii) anatomic abnormalities

(iii) recurrence of obstruction after primary nasolacrimal duct probing.

Mechanism: acts by dilating areas of stenosis in lacrimal system.

Silicone stents are removed after 2-6 months.

4) BALLOON DACRYOCYSTOPLASTY

5) DACRYOCYSTORHINOSTOMY

Creation of a window between the lacrimal sac and nasal cavity. It preserves the active drainage system.

6) placement of pyrex glass tube between the caruncle and nasal cavity (conjunctiv odacry ocystorhinostomy)

COMPLICATIONS

- Acute dacryocystitis
- Chronic dacryocystitis
- Lacrimal abscess
- Lacrimal fistula

REFERENCE

1. Ramesh Murthy- Kerala journal of ophthalmology, nasolcarimal duct obstruction. Vol XIX no.2
2. Baker JD, treatment of congenital nasolacrimal duct obstruction
3. Chiesic, Guerra R, Longanesil etal, congenital nasolacrimal duct obstruction
4. Robb M, congenital nasolacrimal duct obstruction.
5. Wagner RS, management of congenital nasolacrimal duct obstruction.