CYBERSIGHT WEBINAR ON LACRIMAL DUCT OBSTRUCTION IN CHILDREN
LACRIMAL DUCT OBSTRUCTION IN CHILDREN

1. Dr. Suma Ganesh, Dr. Shroffs Charity Eye Hospital, India:
Clinical Diagnosis and Differential Diagnosis of Lacrimal Duct Obstruction in children

2. Dr. Fiona Dean, Consultant Ophthalmologist, United Kingdom:
Intubations and DCR & their role in Lacrimal Duct Obstruction in children

3. Dr. Nishi Gupta, Dr. Shroffs Charity Eye Hospital, India:
Endoscopic Probing and Syringing and DCR in various simple and complex types of CNLDO
Dr. Fiona Dean is a consultant in paediatric ophthalmology and strabismus in UK. Her fellowship was at Great Ormond Street Hospital in London in 1999 and since then she has worked in the UK as a consultant and around the world on Orbis programs.
Dr Nishi Gupta

- Dr Nishi is Associate Medical Director & Head Dept. of ENT, Dr. Shroff’s Charity Eye Hospital, Daryaganj, New Delhi
- She has 29 years of experience in Micro-ear & Endoscopic Sinus Surgeries with special expertise in the endoscopic Dacryology (Treatment of watery eye in children and adults) in children
- Wolf Quiz Award' in All India Sinus Endoscopic Surgery Conference held at Russian Culture Centre in 1998 & Gangaram hospital in Delhi 1999.
- 57 peer reviewed publications on Endoscopic Lacrimal procedures
Dr Suma Ganesh is Head of Paediatric ophthalmology, Strabismus and Neuro-ophthalmology at Dr Shroff’s Charity Eye hospital, Delhi.

She did her fellowship in Paediatric ophthalmology and Strabismus at Manhattan Eye and Ear hospital in 2001 through Marsh Carter Fellowship grant by ORBIS International.

She too is an ORBIS volunteer faculty and done HBP programmes at Nepal and Indonesia.
• Poll question 1
CONGENITAL NASOLACRIMAL DUCT OBSTRUCTION

• Congenital nasolacrimal duct obstruction (CNLDO) is a common disorder in the pediatric population, causing failure in the nasolacrimal duct drainage system

• Epidemiological studies report that the prevalence of CNLDO ranges from 5% to 20% in the early phase of childhood

• CNLDO presents bilaterally in 14% to 34% of cases
CONGENITAL NASOLACRIMAL DUCT OBSTRUCTION

• There is a higher prevalence of CNLDO in premature infants.

• It has also been shown that anisometropic amblyopia may occur in 10% to 12% of children with CLNDO,

• So a proper ophthalmic eye examination and cycloplegic refraction are performed in all cases with a careful subsequent follow-up for three to four years
EMBRYOLOGY AND ANATOMY

- The lacrimal drainage structures begin to form during the **fifth week of gestation** as a crease between the frontonasal and maxillary processes, the nasolacrimal groove.

- A solid cord of ectodermal tissues separates from the surface and enters this groove. This tissue canalizes and forms the lacrimal sac and nasolacrimal duct.

- The lacrimal canaliculi form by a similar process. Canalization begins around the eighth week of gestation and continues until birth.

- Canalization occurs along the entire system at the same time. The opening between the nasolacrimal duct and the nares at the distal valve of Hasner is often not patent at birth.
The commonest causes of congenital nasolacrimal duct obstruction are:

- Membranous persistence at the distal end of the nasolacrimal duct
- Bony abnormalities with associated narrow inferior bony nasolacrimal canal
- Stenosis of the inferior meatus
- The pathogenesis of CNLDO lies in a mechanical obstruction located distally in the nasolacrimal duct (NLD) at the valve of Hasner, where this structure enters the nose
CLINICAL SYMPTOMS

- A comprehensive study of 4792 infants in Great Britain showed that the prevalence of epiphora in the first year of life was 20%, with 95% of these showing symptoms at one month of age.
- The periorcular crusting and discharge are due to infection of the lacrimal system.
- This dacryocystitis in infants with NLDO is typically low grade, and the organisms are usually normal flora.
DIFFERENTIAL DIAGNOSIS OF CNLDO

• NLDO may be confused with infantile glaucoma by primary care physicians due to the presence of epiphora.

• Infantile glaucoma: corneal enlargement, Haab striae, enlarged globe, increased cup:disc ratio, and elevated intraocular pressure.
DIFFERENTIAL DIAGNOSIS

• Any disorder that causes corneal irritation in infants may also be confused with NLDO. Among these disorders are epiblepharon (which may cause irritation due to in-turned eyelashes),

• Primary corneal disorders, and corneal infection.

• These entities can be identified by the presence of associated eyelid or corneal abnormalities.
NATURAL HISTORY OF CNLDO

• Spontaneous resolution of CLNDO has been to occur in up to 95% (32% to 95%) of children by the age of 13 months.

• Higher spontaneous resolution occurs in the first three months of age (80% to 90%), 68% to 75% in the second three months, and 36% to 57% in the third three months.

• The Pediatric Eye Disease Investigative Group (PEDIG) compared immediate nasolacrimal duct probing in the office with conservative management for six months and found that 66% of children with obstruction resolved within six months without intervention.
MANAGEMENT OF CNLDO
1ST 12 MONTHS OF LIFE

• It is widely accepted that unless there is a mucocele or dacryocystitis, CNLDO is managed conservatively in children for the first 12 months of life in one of two ways:
  • Observation
  • Massage of the lacrimal sac (Crigler technique)

• Kushner performed a randomized prospective trial on 132 children with CNLDO.
  He found the massage technique gave a higher resolution rate than simple observation
The massage of the lacrimal sac is a widely adopted conservative treatment modality, with the aim of improving the chances of resolution provided by only observation.

This maneuver was first introduced in 1923 by Crigler.

The technique consists of placing the index finger over the common canaliculus to block the exit of material through the lacrimal punctum and of stroking downward firmly to increase hydrostatic pressure within the nasolacrimal sac.

10 strokes per session - 3 to 4 sessions per day
THE ROLE OF ANTIBIOTICS

• The administration of topical antibiotic therapy has its rationale only when symptoms of discharge are present.

• Moreover, an infection of the nasolacrimal drainage system may lead to severe complications such as orbital and preseptal cellulitis, in which urgent hospital admission with intravenous antibiotic treatment is required.

• Most of the studies agree that antibiotic therapy is indicated only with the clinical evidence of infection, but not in the conservative management of CLNDO.
• PEDIG analyzed the clinical efficacy of early probing in 304 children aged 6 to 15 months and revealed an overall success rate of 75% (95% CI, 70–80%),

• Lower results in bilateral CLNDO compared to unilateral CLNDO (63% vs. 80%; relative risk (RR) = 0.78)

• Several studies reported optimal results in children beyond the first year of age, with a resolution rate ranging from
  76.8% to 89% in children aged 13 to 18 months,
  54% to 88.6% in children aged 18 to 24 months and
  33% to 71.7% in children aged 24 to 36 months
CLINIC VS. OPERATING ROOM PROBING

• Some ophthalmologists perform in-office probing in awake infants, typically at an early age (6 months or younger).

• The benefits of this approach are earlier resolution of NLDO and the avoidance of general anesthesia.

• The downside is increased discomfort and the treatment of infants who would spontaneously improve with additional time.
ROUTINE PROBING AND SYRINGING

• The probe is first placed nearly perpendicular to the eyelid through the lacrimal punctum, then quickly turned to follow the course of the canaliculus parallel to the lid margin. Bowman's probe of 1 or 2 size is used.

• Usually, bone is felt when the probe encounters the nasal wall on the medial side of the lacrimal sac.

• The probe is then turned approximately 90 degrees downward backward and laterally into the naso-lacrimal duct, gently and firmly till it got engaged in the bony canal.

• In most infants a popping sensation is felt as the probe passes through the obstruction.

• After removing the probe, syringing is one with saline and Gentamycin to confirm the patency of the drainage system.
MANAGEMENT OF CNLDO

• Poll question 2 and 3
QUESTIONS ASKED BY REGISTERED CANDIDATES

- At what age do you perform probing and surgery in children?
- At which age you would consider DCR for a child, if probing and dilatation fail to treat epiphora?
- Current treatment for the partial or total absence of the lacrimal punctum, nasolacrimal ducts?
- How do you manage dacryocystocele? Till what age is Probing successful?
- Which cases of CNLDO have a high rate of failure – do we know the risk factors?
- When is endoscopic DCR indicated?