Intubations and DCR
Their role in NasoLacrimal Duct Obstruction in children

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Learning objectives
Intubation of Nasolacrimal system

• What intubation is for
• Why intubation is used
• Levels of success
• When intubation is used
• What types of intubation are available
• When to remove the tubes
• When is DCR indicated
CONGENITAL NASO LACRIMAL DUCT OBSTRUCTION

- 6-20% of paediatric population
- High rate of spontaneous resolution
- Conservative management
- Success rate of 1st probing 76-94%
  - No intubation
- Success of Intubation on first intervention
  - 90%
- Time of intervention controversial

Another problem is the lower success rate of probing with older children. Katowitz and Welsh advocated probing for patients’ younger than 13 months as they found that probing before 13 months had a cure rate of 97%, which was reduced to 54.7% after 13 months of age. However, some between 6 months and 48 months. They found that intubation is successful as a primary management in 90% of cases, in which MCI was used in 70% of cases. Engel et al. reported in a retrospective case series of 635 patients in whom they found an overall success rate of 96%, which showed a decline to 90% in patients older than 24 months.
The 90% disease

- 90% will resolve spontaneously by the age of 18 months (most by 12 months)
- Of the 90% who have Syringing and probe before 20 month old
  - 90% success rate
- Of the 10% failures who have a second procedure (intubation)
  - 90% success rate
- Leaves 1/100 who present with epiphora who require DCR
Data collection - 12 month audit

- Demographics: Hospital #, DOB
- Age at presentation
- Age at procedure done
- Gender
- Unilateral vs Bilateral
- Previous treatment
- Previous episodes of dacryocystitis
- Fluorosceine dye disappearance test (positive/negative/partial clearance)
- Operative findings (tight puncta/unusual anatomy)
- Actual procedure – Probe/syringing/intubation
- Post op treatment
- F/U details
- Persistence of symptoms
- Need for repeat procedure
Outcome according to age at procedure done

45 patients with no previous intervention
Confirmation of a blocked nasolacrimal duct

• History- epiphora since birth

• Signs-
  • High tear meniscus
  • Lacrimal lake is full
  • Discharge and retro-pulsion of pus

  • **Check presence of punctum!**

• Investigation-
  • Dye disappearance test- fluorescein fails to leave the eye after 10-15 minutes.
Aids to decision making - Imaging

- Contrast dacryocystography (DCG) a&b
- CT DCG- with subtraction-c
- Nuclear lacrimal scintigraphy-d
Why and when to consider intubation

• Primary procedure-
  • Planned (due to age)
  • Imperforate punctum
  • Intraoperatively (canalicular abnormality)
  • Dacrocystitis with thickened mucocoele
  • Trauma to the canaliculus
  • Secondary epiphora (not congenital)

• Secondary procedure
  • Failure of previous syringing and probing
What do the tubes do?

• Hold open the punctum/canaliculi and NLD
• Allow through capillary action- tears to travel down the system
• Prevent stenosis of the system structures whilst healing
  • especially after dilatation
• Increases lumen diameter when left in for a period of time thus increasing radius of the passages (radius to flow ratio 1:4)
Types of intubation

• Pushed monocular intubation
  • For stenosed valve of Hasner (congenital)
  • Late treatment (over 18 months old)
  • Trauma to canaliculus (mini Monoka or Masterka) (82-95% successful)

• Intranasal- pulled intubation-
  • Abnormal canaliculus
  • Soft stop
  • Abnormal NLD

• Endoscopic DCR with intubation (necessary with canulicular abnormalities)

• External DCR with intubation
Choosing your intubation type

• Lowest level of skill-
  • Late presentation and treatment of congenital epiphora
  • Competent to syringe and probe
  • Pushed intubation with a Masterka tube

• Patients with difficult syringe and probe
  • Abnormal canaliculus/ NLD/ Dacrocystocoele
  • Needs an experienced operator for nasal retrieval /abnormal canaliculus/NLD
  • Onward referral

• Pulled intubation-
• Types-
  • Ritling probe and Monoka
  • Crawford tubes
  • O’Donohue tubes
Advantages to pushed intubation for simple cases

• Requires low level of skill
• Decreased peri operative risks
  • Less bleeding
  • Reduced nasal trauma
  • No nasal vaso constrictor required
  • Can be performed with the child on a face mask and not intubated (breathing spontaneously)
  • Reduced operating time
  • Results are excellent
  • When planned for later children as primary procedure reduces the incidence of secondary procedure
• Tube can be removed as office procedure (no anaesthetic)
Disadvantages of pushed intubation

• More expensive than Crawford tubes
The Masterka tube- Pushed intubation
Method of Masterka insertion

The Masterka is available in three lengths: 30, 35 and 40 mm.
The operating kit for Masterka tube insertion
Method of insertion of the Masterka

• Probe the tear duct as normal, pushing the probe down to the hard palate.

• Before withdrawing the probe place your finger at the level of the punctum to mark the length

• Measure the distance between finger and end of probe
  • Equates to punctum-hard palate distance

• Choose a Masterka tube which is the same or slightly longer
Syringe with Fluorescein to ensure patency
Insertion of the Masterka tube

- Insert the Masterka tube until the flange is at the punctum
- Hold the flange in place and gradually remove the introducer.

**Failure of the procedure.**
- The guide may pass through the nasolacrimal stenosis with difficulty, but the silicone usually bunches up around the introducer without passing through the stenosis.
Pulled intubation

• Tubes are inserted from the punctum, through the canaliculus down the NLD into the nose and then pulled out from the nose.
The Monoka Tube
Metal to metal touch

• Understand the anatomy
Avantages of the Ritling probe and Monoka tube

• Can be passed through canalicular narrowings or absence
• Can be pushed through rough sided Naso-lacrimal ducts
• Causes less nasal trauma than passing metal all the way through the NLD and nose
• Can be obtained in both single or double ended
• Can be used for traumatic disruption of the canaliculus.
  • Mini Monoka without the Ritling probe.
Trephine

Used to facilitate insertion of tubes in blocked canaliculi or abnormal NLD

**Advantages** - can avoid the need for a DCR

**Disadvantage** -
- requires experienced operator
- Blind insertion.
- The canaliculus needs dilation to 2mm
Tube removal

• Pushed intubation tubes- Masterka-
  • Removed without pain in the clinic without anaesthetic

• Pulled intubation- Requires a GA in children
  • Requires operator skilled in visualization of the nose.

• Timing-
  • 4-6 weeks after DCR
  • punctal stenosis, canalicular stenosis/obstruction, canalicular laceration and canalicular trephination
    • at least 3 months.
Dacrocystorhinostomy

• Endoscopic vs. Surgical external
• Scar- may grow with the child

• Endoscopic requires a skilled operator in endoscopy
  • Can be done in young child once the nasal passage is big enough for an endoscope and an instrument.
  • Orbits grow until end of 5th year of life.
  • Nose grows until age 15 to 17 in women and about age 17 to 19 in men
  • Midface growth continues into the teens and eruption of secondary teeth
Dacrocystorhinostomy

• Indications
  • Failure of Syringing, probing and intubation
  • Congenital syndromes
  • Trauma

• Complications of endoscopic DCR
  • up to 8.6%
  • Scar which grows with the patient
  • Haemorrhage, granulomas, emphysema, sinusitis
  • rare complications such as orbital intracranial traumas.

• The success rates
  • pediatric external DCR range from 89% to 97.5%
  • pediatric endoscopic DCR ranges from 58% to 100%

Learning objectives- conclusions

• What intubation is for- holding open the nasolacrimal system
• Why intubation is used- enhancing treatment and improving outcomes

• Levels of success - high level of success (90%)
• When intubation is used - consider the age
• What types of intubation are available - pushed or pulled
• When to remove the tubes - 6 weeks to 3 months
• When is DCR indicated - when intubation fails