NASOLACRIMAL DUCT OBSTRUCTION

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6 month old child with tearing since shortly after birth
NLDO Presentation

• Signs
• Symptoms
• Differential Diagnosis
Nasolacrimal Duct Obstruction

- clinically evident obstruction below lacrimal sac occurs in about 5% of full-term newborns, however, may be present in 50% of newborns

- symptoms manifest by 1 month old in 80-90%

- epiphora, sticky mucoid or mucopurulent discharge, large tear meniscus over lower lid

- severity may vary from day-to-day
Anatomy

• Punctum – 0.3mm
  – Nasal to most medial MG
  – Lower puncta is more temporal than upper puncta
  – Tilted slightly inward

• Canaliculi
  – Run vertically for 1-2mm
  – Then parallel to margin

• Valve of Rosenmüller
  – Superior fold of mucosa or valve
Anatomy

- **Lacrimal Sac**
  - Occupies lacrimal fossa between ant and post crura of medial canthal tendon

- **Nasolacrimal Duct**
  - Extends downward in slightly lateral and posterior direction

- **Valve of Hasner**
  - Inferior valve

- **Distance from punctum to inferior meatus in infant is approx. 20mm**
Differential Diagnosis

- conjunctivitis
- anomalies of the upper lacrimal drainage system (punctal or canalicular atresia or agenesis)
- entropion and triachiasis
- glaucoma
Infantile Glaucoma

- Tearing
- Photophobia
- Buphthalmos
- Corneal clouding
Clinical Findings
Nasolacrimal Duct Obstruction
Tears and Epiphora: Evaluation

- Inspect eyelids: are puncta open?
- Evaluate ocular surface: any irritation?
- Any swelling of medial canthal region?
- Digital pressure over lacrimal sac: “Blot Test”
  - Moisture indicates obstruction
  - Mucoid reflux suggests complete obstruction at level of nasolacrimal duct
Clinical Testing

- Pressure over lacrimal sac often produces reflux mucoid material through punctum – usually culture +, multiple organisms
- Pressure will always produce (+) “Blot Test”
- Fluorescein dye disappearance test:
  - Significant retention in eye after 5-10 minutes
  - Failure of dye to appear in nose after 10-15 minutes
Treatment

• Non-surgical
  – Observation
  – Massage

• Surgical
  – Probing
  – Silicone Tube Intubation
  – Lacricath Balloon Dilation
Natural History

• 88% resolution (Peterson, Robb)
• 66% resolution (PEDIG) *

*6-10 month olds over 6 months time
Observation
Massage

- Digital massage, “Crigler massage,” of lacrimal sac
  - Performed several times per day
  - Recommend prior to each diaper change
  - Two purposes: empties sac – reducing bacterial load; and applies hydrostatic pressure

- Shown to be effective in increasing resolution
  - Important to show proper method of message
  - Requires significant pressure: child is uncomfortable
Nasolacrimal Duct Obstruction: Massage
Surgery

- Office vs. Operating Room
- Timing
# Probing: Office versus OR

<table>
<thead>
<tr>
<th><strong>Office</strong></th>
<th><strong>OR</strong></th>
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<tbody>
<tr>
<td>cured earlier</td>
<td>more controlled</td>
</tr>
<tr>
<td>no anesthesia</td>
<td>patient immobilized</td>
</tr>
<tr>
<td>?less expensive</td>
<td>airway protected</td>
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<tr>
<td>mobile/crying patient</td>
<td>fewer probings</td>
</tr>
<tr>
<td>one pass with probe</td>
<td>anesthesia</td>
</tr>
<tr>
<td>more probings</td>
<td>?more expensive</td>
</tr>
<tr>
<td>treating patients that would get better</td>
<td></td>
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Cost

- Comparisons between in office probings and OR probings depend on spontaneous resolution rates.
- As the rate of spontaneous resolution increases, the cost of in-office probings become more expensive.
- $771 vs $641 at 75%.
- In-office probings cost $169 per month of symptoms avoided when the rate is 90%.
Cost analysis alone can not answer which is better for the individual patient or surgeon.
Nasolacrimal Duct Probing

- In the Office
- In the OR
Perform the procedure that you are comfortable performing
Surgical Treatment Options
Probing

• Traditional first line of treatment
• High cure rate
Probing: Technique
Success rate (PEDIG)

- 78% in patients 6-36 months
- Too few patients in 36-48 month range to compare
Silicone Tube Intubation

- Types
- Success rate
Crawford Tubes
The thinner section of the thread-guide is shown separating from the probe by sliding out from the open slit.
Mini-Monoka
Masterka
Success rates

• 90% in 6-48 month olds (PEDIG)
• 96% in patients < 24 months (retrospective)
A Kinder, Gentler Silicone Tube Intubation
Balloon Dacryoplasty
Balloon Dacryoplasty

• Role not well defined at this time
• Equipment is expensive
• Generally used in difficult cases or with probing failures
• Deflated balloon catheter placed and inflated inside duct at various levels
Balloon Dacryoplasty

• 82% success rate in same age group when used as a primary procedure
• Cost
Failed Probings

“THE SECOND CHANCE”

WHOMEVER SAID

Everyone gets a second chance
was obviously the one throwing the knives.
Failed Initial Probing

- Second probing (56%)
- Silicone tube (84%)
- Balloon dacryoplasty (77%)