‘Pearls of Wisdom’: Retraction Pockets & Tympanic Membrane Perforations

Gavin Morrison, St Thomas’ & Evelina Children’s Hospital
British Paediatric Otolaryngology Course
Glasgow
12th March 2015
Pearls!
Retraction Pockets
Classifications

• Attic  Tos & Poulsen (1980)

• Pars Tensa  Sade (1979)
Classification - Attic Retractions (Tos & Poulsen)

• Type 1 Retraction towards neck of malleus but airspace visible

• Type 2 Retraction onto neck of malleus - no airspace visible behind membrane

• Type 3 Retraction extends beyond osseous malleus full extent seen

• Type 4 Erosion of outer attic wall
Classification – Pars Tensa Retractions (Sade)

• Stage 1 - Mild retraction
• Stage 2 - Retraction onto incudo-stapedial joint
• Stage 3 - Retraction onto promontory
• Stage 4 - Adhesion of pars tensa to medial wall

In stage 3 the tympanic membrane can be lifted off the middle ear medial wall whereas in stage 4 it is not possible.
What grades of Attic & P. Tensa Retractions are shown here?
Erasmus Surgical Classification (Rotterdam)

- I  Atelectasis of TM
- II Fixed to Promontory
- III Fixed to Incus/Stapes
- IV Deep pocket - limits not visible
- V Deep pocket as IV with cholesteatoma
Management Options for Attic Retraction Pockets

• Conservative
  – Observation & serial audiometry +/- CT scan
  – Microsuction & topical treatments

• Surgical
  – “Open” – atticotomy surgery
  – “Closed” – Combined approach Tympano-mastoidectomy with attic reconstruction
Surgery for P flaccida retractions if:

• Limits not visible Type 3 / 4 & hearing loss
  – AND

• Kertain build up
  – OR

• Intermittent scanty infections
Examples
Attic retractions
What would you do?
Stable vs Unstable

Stable = “Dry”

• Non-erosive, non progressive
• Not getting infections
• No build up of keratin

CONSERVATIVE  - IF GOOD HEARING
Unstable Attic Retraction

OPERATE
Pars Tensa Retractions
Pars Tensa Retractions

Dilemma

Early Surgery vs Late Surgery

Avoid ossicle erosion
Prevent Colesteatoma
Can cause worse hearing

May get Hearing loss
May get cholesteatoma
Management Options for Pars Tensa Retraction Pockets

• **Conservative**
  – Observation & serial audiometry +/- CT

• **Surgical**
  – Ventilation tube
  – Excision of Pocket alone
  – Excision of pocket with grafting
  – Excision +/- graft + Grommet
  – Cartilage reinforcement tympanoplasty
Can the Literature give us the answers?
Pars tensa Retractors in children by excision and ventilation tubes


- 74% TM healing

- 22% Re-retraction
Cochrane Review –
Surgery for Tympanic Membrane Retraction Pockets

• Nankivell PC and Pothier DD
• 2010
• 42 studies – 2 RCTs
• Barbara 2008 (attic reconstruction) & Elsheikh 2006 (pars tensa repair + - T tube)

• “No statistical benefit of surgical intervention”
• “There is currently no good evidence for the role of any individual surgical intervention for the management of atelectasis of the tympanic membrane”

BUT

• One Year Follow up only!
• No mention of attic retraction even though one paper only concerned this.
Pars Tensa retractions - Natural History?

• **TARGET trial** – MISLEADING
  • Retractions are spontaneously variable with time and may be reversible

• **Postero-superior retractions lead to 1o acquired cholesteatomas**

Examples
Pars Tensa retractions
Pars tensa retraction - What are you going to do?
What are you going to do?
How do you know if this retraction is going to progress?
Grommets for Pars tensa retraction
Pockets if under 10 and:

• Stage 1 and hearing loss from OME
• Stage 2 and hearing loss or GENUINE erosion of LPI noted
• Stage 3 with HL
• Atelectasis ? Stage 4
Strategy for Pars Tensa Retractions

• Use otoendoscope if limit not seen

• Younger child – Repeated Ventilation tubes of hearing loss
• Older child – consider excision & grafting
• Always monitor the ME pressure: -ve = delay surgery

• Progressive or unstable poster-superior retraction - Operate
• If hearing loss – offer surgery

• Decision also depends on status of contralateral ear, age of patient & historic rate of progression
Reconstructive surgery for P tensa retraction if:

• Grade III retraction when adolescent?
• Retraction limits not seen in facial recess/sinus tympani and unstable – periodic infections
• Retraction into facial recess / sinus tympani & tympanogram improving
• Grade IV retraction when adolescent
Mild retraction
Good hearing

Pars tensa retraction pocket

Atelectasis/collapse
Deep retraction
Early LPI erosion
Good or bad hearing

Glue ear
Hearing loss

Unstable retraction
Limit of pocket out of view
Ossicular erosion

Observation extrudes

Resolved:
 discharge patient

<10 years

>10 years

Trial grommets

Failure

Reinforcement tympanoplasty
+/- ossiculoplasty
+/- long term ventilation tube
Summary

• Classifications described
• Vent. Tubes correct P.tensa retractn. while in situ
• Postero-superior pockets can erode ossicles & develop cholesteatoma
• Surgery can be preventative or corrective.
• Operate if poor hearing or progression over time
• Balance risks of surgery vs. risks of non-intervention
• Cartilage repair has gained popularity
Perforations
Safe vs Unsafe ears

• Brain abscess:
  After cholesteatoma in 46 %
  After mucosal disease in 38%
  After mod. Rad. mastoidectomy in 15 %

Browning GG, The Unsafeness of safe ears, JLO. 1984a; 98:23-26
Aetiologies of TM Perforations

- AOM → perforation
- Otitis Externa – myringitis (fungal)
- CSOM
- Specific Chronic Suppurative Otitis Media
  - TB, Actinomyces, Syphilis
- Direct trauma to membrane
- Post ventilation tubes (2.75 % /ear, 4.6% /child, 1/3 t-tubes)

- Barotraumatic
- Blast Injury
  - beware implantation cholesteatoma
Size Matters

- Conductive Hearing Loss variable: 0 – 50 dB
- Larger perforation = larger ABG
- Low frequencies greatest affected

- Post ½ TM – transmits low frequency
- Ant ½ TM transmits high frequency
Management of TM perforations

• Conservative
   “A small perforation is good, it acts as a natural ventilation tube”

Small hole, no infections, good hearing, poor ETD = leave alone

• Surgical
   “The perforation is bad, it leads to recurrent ear infections and restricts water sports”

Recurrent infections, hearing loss, other ear good = repair
Management of TM perforations

• Conservative
  • Swabs + microsuction
  • Keep ear dry (earplugs for swimming)
  • Topical Agents - Ofloxacin or Ciprofloxacin drops, + steroids
  • Systemic antibiotics
Management of TM perforations

• Surgical
  – Myringoplasty / Tympanoplasty
  – +/- - Adenoidectomy ?
Indications for repair of perforation

• Any Ear with cholesteatoma

• Not healed spontaneously after 6 months observation and...

• Recurrent otorrhoea

• Disabling conductive hearing loss
  • Bilateral ( >30 - 40 dB)
  • Unilateral

• To allow watersports
Wullstein Classification of Tympanoplasty (1956)

- **Type I** – Myringoplasty = 3 ossicles present & drum repair

- **Type II** – Malleus/incus eroded – reconstruction preserves middle ear depth

- **Type III** – Lateral ossicles gone, graft onto stapes superstructure, columella effect, shallow ME cleft

- **Type IV** – No ossicles, graft onto footplate

- **Type V** – graft onto fixed footplate, Va = fenestration of LSSC
Tympoanoplasty Type 1 in children – an evaluative study


- 80% graft success rate at 6 month

- 61% significant improved hearing
Meta-analysis of Pediatric Tympanoplasty


- Graft take rate 80% in perf less than half TM
- 69% if over half TM
- Take rate with good vs poor ET function 87% cf 77%
- Adenoids – no difference
- Normal contralat ear vs abnormal: 80% cf 71%
- Wet ear – no difference

- Increased success rate with increasing Age (p =0.005)
What Age to perform myringoplasty?

- Success rate **not** influenced by age (*eg* House Ear Institute, Chandrasekhar et al. Arch Oto H&N Surg 1995; 121:873-878, and Denoyelle, Garabedien group, Paris Laryngoscope)

- Mean age of most paediatric published series = 10 – 11 years (range 4 – 17)

- General Advice (G.Morrison)
  - Other ear predicts outcome
  - 7 – 8 yrs or over if infections controllable and one good hearing ear
  - As early as 3 – 4 if bilat. Subtotal perfs. with disabling hearing loss & infections
Myringoplasty – Personal Surgical tips

- Consider periosteum graft
- Dry graft thoroughly
- Trim graft to exact size (little finger nail)
- Underlay or reverse thru-lay technique
- “Kerr” ant wall pocket if no anterior lip
- Subcuticular resorbable sutures
- BIPP pack(s) except v young
Cartilage Tympanoplasty

• Jansen 1958
• Heerman 1962 – cartilage palisade

• Techniques
  – Island graft
  – Palisades
  – Butterfly inlay
  – Cartilage Shield
Indications for Cartilage Tympanoplasty

• Retraction pockets
• Atelectasis
• Poor ET Function
• To prevent prosthesis extrusion
• (Revision Surgery)
Reinforcement Tympanoplasty for retraction.
Post Cartilage Tympanoplasty & Incus transposition
Surgical Outcomes for Paediatric Myringoplasty

- Fat plug Myringoplasty – 80 % success
- Paper - steristrip myringoplasty – 65%
- Formal Myringoplasty - over 80 % closure
  - 60 - 81 % hearing success

- Hearing gain - ABG to < 10 dB to 2/3, <20 dB in 88.3 %

- Risk of OME after repair – 7.8 %
- Long term graft breakdown – 6.5 %
Wet Ear Surgery

• Moist ear – OK.

• Purulent Ear – Surgery Contraindicated
Conclusions

• AOM, and CSOM without cholesteatoma can lead to intracranial complications
• Persistent perforations post grommets are seen in up to 4.6 % patients
• Operate when ET function improved
• Cartilage Tympanoplasty has advantages in special cases
• You can routinely repair ears at 8 years
• Surgery best avoided in a purulent ear.
Thank You