Exostoses

Dr E F Post
Exostoses

- Case presentation
- Clinical
- Histology
- Differential diagnosis
- Management
- Discussion
Patient details

- 26 yo male
- P.ENT: Nil
- PØ: Nil
- PMHx: Nil
- Allergies: Nil
- Social: 3 pack years
Patient History

- History: Bilateral blocked ears 3/12
  Hearing loss right 2/12
  Occasional pain in right ear
  No other ENT complaints

- Sport: Active swimmer
  Used to surf for few years, ? Exact time
Examination

- Ears:
  - Left: Small amount of wax removed
  - Exostoses – Antero-superior
  - Unable to visualise TM
  - Right: Exostoses – Post, Sup-Ant,Inf-Ant
    - 3 + 7 + 12 o’clock
    - No OE
    - Unable to visualise TM

- Mouth: NAD

- Throat: NAD

- Nose: NAD
Special investigations

- Audiogram:
  - Right: Moderately-severe conductive hearing loss
  - Left: Mild to moderate conductive hearing loss

- Blood: NAD
Surgery

- Endaural incision
- Lateral skin elevated off lateral part of exostosis
- Drill bone away
- Medial bone eggshelled and fractured off
- Exostosis extensive / down to TM
Plan

- Discharged day 2
- OPD review day 10
- Followup audiogram
Exostoses
Exostoses

- Aetiology
- Clinical
- Histology
- Differential diagnosis
- Surgery: complications
  - less radical
Aetiology

- Never conclusively established
- Assoc with exposure to cold H2O
- Periosteal irritation ("periositis")
  - Penetration of cold water into deep part of EAC
- Stimulate lay down of new bone
  - Dense compact bone
- Aquatic sports: surf, swim, dive, etc.

"SURFER’S EAR"
Clinical presentation

- Often bilateral and multiple nodules EAC
- Incidental finding
  - 6% ORL practice
- Intermittent otalgia
- Recurrent Otitis externa} >80 % obstruction
- Conductive hearing loss}
- Chronic cerumen impaction
- Occluded external ear canal
Clinical presentation

- Hard, smooth rounded nodules
- Whitish (thin epithelium)
- Close to sulcus tympanicus
- Narrowing of osseous meatus
- Bilateral
- Multiple
- Sessile
- Assess by palpation (not need radiology for Dx)
Clinical presentation

- Arise anterior / posterior wall of deep part of bony EAC
- Severe: occlude EAC
- < frequent: roof = triangular narrowing of deep canal
- EAC size relates to symptoms
  - Narrow: squamous debris / obstruction / infection
  - Hearing loss seldom; if impaction of debris
  - Mostly asymptomatic
Anthropology:
- Crania American Indians: average 10.8% (1.1 – 31.8% variance)
- > prevalent in coastal civilizations
- > common in cold water civilisations

1938
- Van Gilse: > prevalence in specifically cold H2O swimmers

1942
- Fowler/ Osman: produce Ex in guinea pigs
  prolonged meatal erythema < 17.5 °C
  repeated exposure (1 hr. 9/52)

1998
- California: 307 surfers;
  73,5% exostoses

6.3 / 1000 of patients in ORL practices
Prevalence

- May 2002/ Virginia/ Otolaryngology:
  Prevalence and severity; cold vs warm H2O
- 212 surfers; otoscope; photodocumented
- Warm = Hawaii / East coast
- Cold = California, rest of world
- Look at temp. willing to surf
- Grades of patency: normal 100%
  mild 66 – 99%
  moderate-severe <66%
Results

- Exostoses:
  - 38%: 69% mild grade
  - 31% moderate-severe - willing to surf $\downarrow T^\circ$

- Length time surfed linear relation to:
  - Prevalence exostoses +
  - Severity
  - Risk of developing: Ex.increases by: 12%/ year
    moderate-severe $\uparrow 10% / year$

- Otological symptoms:
  - History O.E. - 52%
  - Subjective hearing loss - 22%
Fig 1. Prevalence of external auditory exostoses by group. Professional (odds ratio 3.8) and cold water (odds ratio 5.8) surfers were at an increased risk for exostoses.
% obstruction $\propto$ time in H$_2$O

- Oregon surfers, USA, 1996:
  - 21 surfers
  - Obstruction:
    - 1-5 years surfing: 7.5% 
    - 6-15 years: 63% 
    - >15 years: 93%
  - (<) 50 sessions per week per year: 10% 
  - >50 sessions per week per year: 87.5%
Histology

- Parallel dense concentric layers of subperiosteal bone
- Originating from near tympanic ring / medial to sutures of tympanic bone
- Bilateral, multiple, sessile
- Broad base (not pedicle)
- Covered by squamous epithelium of EAC
- Abundant osteocytes
- Remodelling into lamellar bone
  - Start around vascular channels
- Devoid of fibrovascular channels
  - NO marrow-type spacing
Clinical diagnosis
- 2003, Spain, Acta ORL
- Found some lack of specificity of histology

To determine extent
- Esp. proximity to TM
- Space between TM and exostoses
Multiple exostoses: CT scan
Differential diagnosis
Osteoma

- Single bony nodule
- Unilateral
- Larger than Exostoses
- Rare; middle aged male
- Benign
- Pedunculated
- Attached to tympanosquamous / tympanomastoid suture
  - Skin/ subcutaneous = thicker here +↑ vascularity
- Skin covering is thickened
- Can be near outer portion of osseus meatus
- Should be removed
  - Else continue to grow and occlude EAC
osteoma
Osteoma of tympanic bone
Osteoma of tympanic bone: dental radiograph
Osteoma: histologically

- Dense squamous epithelium
- Abundance of fibrovascular channels surrounded by normal compact lamellated bone (cortex)
  - Fibrous tissue
  - Sinusoidal-like blood vessels
- Bone between channels in different directions
- Few osteocytes
- Osteoblast: active bone growth
Differential diagnosis

- Osteoma
- Chronic Otitis externa
- Postsurgical stenosis
- Congenital / acquired atresia
- Others
Chronic otitis externa
Epidermal inclusion cysts
Acquired stenosis of external auditory canal
Collapsing external auditory canal
Ceruminoma of external auditory canal
Acute localized otitis externa (furuncle)
Adenocarcinoma of external auditory canal
Management

Treat if symptomatic

- Prevent: hooded wet suits, educate
- Medical Rx e.g. suction debris / irrigate, Sofradex
- Surgical Indications:
  1. failed medical Rx
  2. symptoms severe (>80% obstruction):
     i. Troublesome obstruction – retain epidermal debris
     ii. Repeated attacks of otitis externa
     iii. Conductive hearing loss
Surgery: Procedure (s)

- Removal transmeatally or post-auricular or endaural
- Local or GA
- Not transmeatal if complete obstruction
- Meatal skin flap (+ periosteum) elevated and preserved
- Shield TM:
  - Silastic circular piece (Seftel)
- Drill sessile bony swellings
  - Until only shell remains
- Anterior wall drilling may be difficult
- Walls fractured inward
- Replace skin: sponges and Gelofoam, topical Sofradex
Surgery: complications

1. Trauma / Perforation of TM
   - Australia 110 pt / 11 ø per year: 9%
   - California 65 pt / 11 ø per year: 22%
   - European centres 1 – 5.1ø per year: 28%

2. Sensory neural hearing loss

3. Dehiscence of temperomandibular joint

4. Facial nerve injury

5. Trauma to skin flap: Cicatricial stenosis
Surgery: Complications

- Close proximity to TM
  - Esp. anterior exostoses in narrow angle between TM and anterior meatal wall
  - Sometimes unavoidable if adhesions between TM and skin overlying EAC exostoses
  - ↓ by using: 1. silastic / aluminium foil to protect
    2. Diamond (not cutting) burs
    3. Bone curettes (not cutting burs)
Surgery: less radical approach

- Denmark study, 1999, Aurius Nasus Larynx
- 20 year period, complications 12.5%
- 24 occluded EAC due to exostosis (HL, OE, Pain)
- Free of Symptoms – no Reø / Rx;
- 19 some exostosis remnants but normal skin + normal migration properties
- **NO regrowth** – change activities
Suggested

- Removal of bone from post, inf + ant walls (with canal skin preservation): creates enough lumen for permanent cure
- Less radical drilling esp:
  - Along superior wall: Small Short process of malleus handle (SNHL)
  - Along tympanomeatal angle:
    Curved EAC = ant drum border not seen / TM damage
- **No need to remove all exostosis**
  - Suggest: Leave entire superior exostosis
    Leave superior parts of anterior exostosis