Core Presentations

By the end of this year, you should be able to perform a competent medical interview, physical examination and suggest a basic investigational plan for a patient presenting with this symptom.
An accurate diagnosis is:

90% History

9% Examination

1% Investigations
Ear: what you think of...
What an ENT Surgeon thinks of...
What can an ear do?
What can an ear do?

- Otorrhoea
- Otalgia
- Hear
- Tinnitus
- Vertigo
Otalgia: DDx

In most cases of otalgia in children, the otalgia is primary, whereas less than half of the cases of otalgia in adults are primary (Paparella and Jung 1991; Neilan and Roland 2010).

Most cases of primary otalgia are not neurologic. The most common cause in children is otitis media, but various infectious, inflammatory, traumatic, and malignant conditions of the external and middle ear can cause otalgia in both children and adults (Olsen 1986; Paparella and Jung 1991; Weissman 1997; Wolfe et al 2002; Heilbrun et al 2003; Wang et al 2005; Samuels et al 2007; Dong et al 2008; Ling and Sader 2008; Neilan and Roland 2010). Otitic barotraumas and barotalgia is common among air travelers (Janvrin 2002; Singh 2002; Mirza and Richardson 2005). Rare causes of primary otalgia include Gradenigo syndrome (Weissman 1997), neuralgias of the geniculate ganglion or the tympanic branch of the glossoaryngeal nerve (Reichert 1933; Cooper and Cavicke 1963; Yeh and Tew 1984; Paparella and Jung 1991; Rupa et al 1991; Lovely and Jannetta 1997), 12th nerve neurilemmoma occurring the middle ear (Tralla and Schindler 1982), and aberrant carotid artery in the middle ear (Saito et al 1975). Other non-neurologic causes of primary otalgia include acute otitis externa (“swimmer’s ear”), a carbuncle or furuncle (folliculitis) of the external auditory canal, foreign bodies in the external auditory canal, bullous myringitis (a viral infection of the tympanic membrane), malignant external otitis (a necrotizing, potentially fatal, pseudomonas infection of the skull base affecting immunosuppressed individuals and diabetics), keratosis obturans (accumulation of desquamated keratin in the external auditory canal), cholesteatoma, squamous cell and other malignancies, mastoiditis, and chronic serous otitis media associated with eustachian tube dysfunction (Weissman 1997).

Secondary otalgia may be caused by a wide variety of inflammatory, infectious, neoplastic, musculoskeletal, and vascular disorders of the head and neck, including disorders of the paranasal sinuses and nasal cavity, nasopharynx and retropharynx, the oropharynx and oral cavity (eg, peritonsillar abscesses or “quinsy tonsil”), teeth (eg, dental infection, malocclusion, impacted teeth, erupting teeth, and bruxism), the temporomandibular joint, the parotid gland (eg, mumps parotitis, bacterial parotitis, or parotid neoplasm), hypopharynx and larynx (eg, carcinoma as well as rheumatoid arthritis or ankylosing spondylitis involving the cricoarytenoid joint), the thyroid gland, the esophagus, the lungs, and the neck and cervical spine (Paparella and Jung 1991; Weissman 1997; Subramaniam and Majid 2003; Tuz et al 2003; Kuttila et al 2004; Charlett and Coatesworth 2007; Ely et al 2008; Jaber et al 2008; Kuo et al 2008; Neilan and Roland 2010). Referred dental pain, temporomandibular joint pain (Costen syndrome), and cervical spine pain are among the most commonly reported causes of secondary otalgia (Costen 1934; Arlen 1977; Brook et al 1980; Bush 1987; Bush et al 1999; Kuttila et al 2001; 2004; Tuz et al 2003; Charlett and Coatesworth 2007; Ely et al 2008; Jaber et al 2008). Pain from dental infections of the molars, especially mandibular molars, can radiate to the ear (Weissman 1997). Bruxism (teeth clenching) typically produces bilateral otalgia, whereas most other causes produce unilateral otalgia (Weissman 1997). Otalgia can be a presenting complaint in patients with nasopharyngeal carcinoma (Rareshide and Amedee 1990; Waollons and Morton 1994; Marshall and Mahanna 1997; Charlett and Coatesworth 2007). Rare causes of secondary otalgia include Eagle syndrome (Eagle 1937; Correll and Wescott 1982; Bafaqeeh 2000; Subramaniam and Majid 2003), infections or metastatic adenocarcinoma of the temporal bone (Hill and Kohut 1976), and intrapetrous carotid artery aneurysms (Banfield et al 1995). Eagle syndrome results from an elongated stylid process and is associated with otalgia, cervicofacial pain, tinnitus, and in some cases impingement of the external or internal carotid artery with carotidynia (Weissman 1997; Beder et al 2006).

Neurologic disorders causing secondary otalgia include migraine (Teixido et al 2011); trigeminal neuralgia (typically a facial pain, but pain can also radiate to the ear) (Weissman 1997); trigeminal neurinomas (Nager 1984); malignant trigeminal schwannoma ....
A more useful approach...
General Pathological Processes

VINDICATE
V-vascular
I-infectious/inflammatory
N-neoplasia
D-drugs/degeneration
I-idiopathic
C-congenital
A-anoxia/acid-base imbalance/auto-immune
T-trauma/toxins
E-ethyl alcohol, endocrine

Genetic: too much vs. too little of a good thing
Ask 4 Questions...

- What is the most likely diagnosis?
- What is the most IMPORTANT diagnosis?
  - Could this be life-threatening?
- What information do I need to confirm my diagnosis?
- What’s my time frame?
Primary vs Referred Otalgia

Children: Primary >>> Referred
Adults: Primary < Referred
Primary Causes of Otalgia

Infections/inflammatory

- **Outer Ear:** otitis externa, malignant otitis externa, furuncle, foreign body, myringitis
- **Middle Ear:** acute otitis media, mastoiditis, cholesteatoma
- **Inner ear/temporal bone:** Gradenigo Syndrome
- **Neuralgia:** Facial nerve incl. herpes zoster oticus, Jacobsen’s nerve, Arnolds Nerve

Vascular: Aberrant carotid artery, carotidynia, carotid aneurysm

Neoplasm: pain = malignancy UPO.

- Pinna, ear canal, middle ear cleft, meningeal/intracranial/skull base.

Trauma: Barotrauma, penetrating or blunt gross trauma
Ear: Referred Pain

- **V₃**: auriculotemporal nerve
- **VII**: via IX & X
- **IX**: Jacobsen’s (tympanic) Nerve
- **X**: Arnold’s (auricular) Nerve
- Cervical plexus:
  - GAN (C2/3)
  - Lesser occip’l (C2+3)
Otalgia: Context of a Symptom

- **Symptom itself**: acuity, duration, severity, variability, progression, triggers/relievers.

- **Patient**: age, sex, race, lifestyle (profession, hobbies, smoking, alcohol, other drugs, other carcinogens/toxins, diet), immune status (Immunosuppressed? Atopic? Autoimmune conditions?), geography.

- **Associated features**: what else is changing?
  - Local, adjacent structures
  - Regional
  - Distant organ dysfunction
  - Systemic symptoms
Otalgia: Examination

- Ear
- Musculoskeletal system: TMJ, cervical spine, neck muscles, muscles of mastication.
- Remainder of the ENT system, including flexible nasendoscopy
Top 3?

VINDICATE
V-vascular
I-infectious/inflammatory
N-neoplasia
D-drugs/degeneration
I-idiopathic
C-congenital
A-anoxia/acid base
imbalance/auto immune
T-trauma/toxins
E-ethyl alcohol, endocrine
Genetic
Top 3

Infection

Inflammation: Teething, OME

Traumatic (Foreign Body)
Inflammation

Color, Dolor, Rubor, Tumor, Functio laesa
(Heat, pain, redness, swelling, loss of function)
Top 3?

VINDICATE
V-vascular
I-infectious/inflammatory
N-neoplasia
D-drugs/degeneration
I-idiopathic
C-congenital
A-anoxia/acid base
imbalance/auto immune
T-trauma/toxins
E-ethyl alcohol, endocrine
Genetic
Top 3

Infection: 1°, 2°, teeth.

Inflammatory: teeth, cholesteatoma

Trauma: TMJ, neck
VINDICATE
V-vascular
I-infectious/inflammatory
N-neoplasia
D-drugs/degeneration
I-idiopathic
C-congenital
A-anoxia/acid base
imbalance/auto immune
T-trauma/toxins
E-ethyl alcohol, endocrine
Genetic
Top 3

Trauma/Degeneration: musculoskeletal

Infectious/inflammatory: Otitis media, otitis externa, pharyngitis, tonsillitis, cholesteatoma

(Neoplasia)
Top 3?

VINDICATE
V-vascular
I-infectious/inflammatory
N-neoplasia
D-drugs
I-idiopathic
C-congenital
A-anoxia/acid base
imbalance/auto immune
T-trauma/toxins
E-ethyl alcohol, endocrine
Genetic
Top 3

Neoplasia

Infection: 1° vs referred pain

Degenerative: TMJ, cervical spine/muscles
Cancer until proven otherwise
Dangerous Causes of Otalgia

Infections
- Acute otitis media and its complications
  - Mastoiditis
  - Intracranial sepsis
  - Sigmoid sinus thrombosis
  - Otitic hydrocephalus
- Cholesteatoma
- Malignant/Necrotizing otitis externa

Malignancy
- Otalgia may be the only symptom of an underlying cancer
- Usually, no other ear symptoms
- Context of Symptom:
  - Pain: prolonged, constant and unrelenting, deep seated, severe, gnawing or aching.
  - Patient: older, known carcinogen exposure, FHx malignancy
  - Associated features: seek carefully for other subtle ENT symptoms
Investigations

- Know the question you want to answer.
- Only order an investigation if the result will affect your management.
- A proper initial clinical assessment and then repeated thorough clinical assessment is always much better than multiple non-targeted tests.
- Recruit help.
Investigations

- Blood tests
- Microbiology: bacteria, fungal, viral
- Biopsies
- Imaging: plain XRs, US, CTs, MRI, PET, other (SPECT, nuclear medicine etc).
- Other: audiology, resp function tests, endoscopy, oximetry, ABGS etc.
- Operations: diagnostic endoscopy, open operations
- Repeated clinical assessment (history and examination) can be considered a very appropriate investigation in many cases.
Imaging

- Plain XRs
- Ultrasound
- Computed Tomography
- Magnetic Resonance Imaging
- Positron Emission Tomography
- Nuclear Medicine Scans
- The weird and wonderful
FESS (functional endoscopic sinus surgery)

**Must Do**
- Must have CT Sinuses (<12 months old) present at the operation – no scan, no operation. Inspect CT at pre-admission (if hard films, confirm all are present) and document location of CT in notes.
- 5 days pre-op prednisolone (25mg) and roxithromycin (300mg) for all patients. Discuss with registrar if contraindication.
- Consent all patients for +/- septoplasty for access

**Indications**
- Symptomatic inflammatory sinus disease
- Sinus/lateral nasal wall neoplasm
- Treatment of intraorbital or intracranial complications of sinus infection
- Access for skull base surgery