Asymmetrical Sensorineural Hearing Loss

Disclaimer

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Background

About asymmetrical sensorineural hearing loss

Sudden onset (<10 days):

- The aetiology of sudden sensorineural hearing loss is often unclear, but may include viral causes, microvascular events, trauma, or autoimmune inner ear disease.
- Patients often awaken with a sudden hearing loss or blocked feeling with or without tinnitus or vertigo.
- Spontaneous improvement in hearing occurs in about 2 out of 3 patients, but recovery may not be complete. Recovery is more likely in younger age groups and in those with milder losses.

Long-standing onset (> 10 days) – consider these causes:

- Presbycusis (age-related sensorineural hearing loss) – progressive, symmetrical, high frequency hearing loss.
- Noise-induced hearing loss – high-frequency loss maximally 4 to 6 kHz. Typically seen in patients with a history of industrial noise exposure.
- Acoustic neuroma – a benign tumour originating from the 8th cranial nerve:
  - Patients generally present with unilateral sensorineural hearing loss, often with unilateral tinnitus and vertigo.
  - These tumours are uncommon, with an approximate incidence 2.5 per 100,000 per year.
- Ménière’s disease presents with paroxysmal attacks lasting approximately 20 minutes of vertigo (with or without vomiting), tinnitus, aural fullness, and gradual unilateral hearing loss.

Red flags

Sudden onset hearing loss of unclear or suspected microvascular aetiology

Assessment

1. Take a history:
   - Determine if the hearing loss is:
     - sudden onset i.e., < 10 days.
     - long standing i.e., > 10 days.
     - Ask about other symptoms of inner ear pathology such as tinnitus and vertigo.

2. Consider specific aetiologies:
   - Viral – possible prodrome
   - Microvascular insult – other focal neurological symptoms, risk factors for thromboembolic disease
   - **Ototoxic medications** – do not assume this is the cause of the asymmetrical hearing loss as ototoxicity is likely to be symmetrical
Ototoxic medications

Include:

- gentamicin
- vancomycin
- macrolides
- loop diuretics
- salicylates
- NSAIDs
- quinine
- some chemotherapy agents

- Acoustic neuroma – family or personal history of neurofibromatosis type 2

Neurofibromatosis type 2

- A central form with central nervous system tumours rather than skin lesions.
- Tend to have bilateral acoustic neuromas.

- Meniere's disease – classic triad of vertigo, tinnitus, and sensorineural hearing loss

3. Perform ear examination.

Ear examination

- Expect a normal ear examination for sensorineural loss, whereas conductive loss may have wax impaction, otitis media, or otitis externa on otoscopy.
- Determine whether the hearing loss is conductive or sensorineural:
  - Weber’s test: 512 Hz tuning fork held on the midline of the cranium.
    - Normal – heard centrally.
    - Sensorineural hearing loss – lateralises to “good” ear.
    - Conductive hearing loss – lateralises to the “bad” ear.
  - If conductive, consider Otitis Media.
- Examine cranial nerves, especially looking for facial weakness.
- Perform neurological examination:
  - Muscle tone, reflexes, power, and coordination
  - Cerebellar signs – nystagmus, ataxia, dysdiadochokinesia (inability to perform rapidly alternating movements), hypotonia
  - Cognitive function

4. Arrange audiology assessment for audiometry with bone conduction:
Audiometry with bone conduction

Audiograms test for pure tone i.e., the ability to hear pure tone at different frequencies, from low pitches (250 Hz) to high pitches (8000 Hz). Hearing is tested with both bone and air conduction to determine whether any hearing loss is conductive, sensorineural, or mixed.

- If sudden onset, telephone for urgent appointment (within 24 hours).
- If long-standing, next available appointment

Management

Sudden onset

1. If suspected microvascular cause or unclear aetiology, arrange immediate ENT referral or admission.
2. If no contraindications, **start prednisone urgently** at 50 mg per day for 7 days (unless frail, elderly), with a repeat audiogram at 7 days:

Start prednisone urgently

- This is considered standard therapy for sudden sensorineural hearing loss when microvascular insult, ototoxicity, acoustic neuroma and conductive hearing loss has been excluded on history and examination.
- Evidence for the benefit of steroids is unclear but it is thought that steroids may result in some recovery of hearing.1
- In the elderly, microvascular events are more likely to be the cause and steroids are less likely to help.
- Those patients with a milder hearing loss seem to recover hearing better compared with those with a profound hearing loss regardless of whether they were given steroids or not. Those with a moderate hearing loss seemed to have a better recovery with steroids.2,3
- Ideally this should be started only after an audiogram has shown a significant sensorineural hearing loss but this will not be possible in all situations.

- If no improvement in hearing, taper prednisolone down over an additional week.
- If significant improvement, consider continuing steroids – seek ENT advice

3. Request an urgent or routine ENT referral within 1 week for follow up after audiometry.

Long standing

1. If audiometry suggests **suspected acoustic neuroma**, consider MRI Brain or CT-IAM before arranging urgent or routine ENT referral:

   **Suspected acoustic neuroma**
   - Unexplained cause and asymmetry of hearing:
     - ≥ 15 dB at 2 consecutive frequencies (bone conduction)
     - ≥ 20 dB at 3000 kHz (masked bone conduction)
   - ≥ 30 dB at any frequency (masked bone conduction)
   - Any asymmetry with associated unilateral tinnitus, vertigo or imbalance, or other neurology.
A family history of **neurofibromatosis type 2**

**Neurofibromatosis type 2**
- A central form with central nervous system tumours rather than skin lesions.
- Tend to have bilateral acoustic neuromas.

- If asymmetrical hearing loss is the only symptom, consider these **factors** before ordering MRI screening.

### Factors for MRI screening

**If > 70 years or in poor health, consider:**

- The likelihood of scan showing a tumour is small. Only approximately < 4% of those with an asymmetrical hearing loss have an acoustic neuroma.
- Acoustic neuromas are benign and tend to grow slowly, if at all. Monitoring with serial audiometry is sufficient in the elderly patient with minimal symptoms.
- Surgery is usually indicated in young patients, whereas in older patients an initial period of observation is common unless a tumour is very large, or is actively growing with increasing symptoms. Radiation therapy is an option to try and arrest tumour growth in non-surgical candidates.

- CT head is not the imaging modality of choice – if MRI contraindicated, **CT-IAM** can be used.

**CT-IAM**

- Can be used where MRI is contraindicated.
- It will not exclude a small acoustic neuroma.

2. Consider a referral for **hearing aids** for patients with long-standing or age-related hearing loss.

### Referral

- If sudden onset hearing loss of unclear or suspected microvascular aetiology, arrange **immediate ENT referral or admission**.
- If sudden onset sensorineural hearing loss:
  - Arrange urgent **audiometry** with bone conduction.
  - Request **urgent or routine ENT referral** within 1 week for follow up after audiometry.

- If long standing asymmetrical sensorineural hearing loss:
  - Request an **audiogram** with bone conduction.
  - If risk factors for acoustic neuroma or asymmetry in audiogram, request **urgent or routine ENT referral**.

- For patients with gradual onset hearing loss or symmetrical, age-related hearing loss, refer for **audiology management** only.
Information

For health professionals

Further information

Patient – Hearing Problems

For patients

Australian Hearing

References


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