VESTIBULAR DISORDERS — MENIERE'S DISEASE

📃 Example Case Scenarios

1. A 40 years old male presented with recurrent episodes of vertigo that lasted for 1 day along with tinnitus and hearing loss in the right ear. Tympanic membrane is normal, Nystagmus is towards the right ear. There is sensorineural loss in audiometry.

2. A 35 year old male presented with severe vertigo with nausea and vomiting for the last 4 hours. On examination the tympanic membrane is normal and Rinnies +ve but ABC is reduced. On PTA, SNHL of the right ear is present. Patient is also giving h/o tinnitus and similar episodes last year.

3. A 35 year old woman has a 3 years history of off and on attacks of vertigo, tinnitus and hearing loss

that usually improves within the next 5-8 hours. Otoscopy is normal but pure tone audiometry shows sensorineural deafness.

4. A 40-year-old male presented with a sudden severe episode of vertigo, nausea and vomiting. It lasted for 7 hours. His PTA showed mild sensorineural hearing loss in right ear. He had similar episodes of vertigo in previous years.

5. A 35 years old male presented with episodes of left sided hearing loss, vertigo and tinnitus. Vertigo remains 3-4 hours associated with vomiting. Rinne's +ve on both sides.

🧾 Case Features

- Age: 35-60 years
- Gender: Male predominance
- Symptoms:

- Episodic vertigo lasting 20 minutes–24 hours
- Sensorineural hearing loss (initially low frequency, later flat or falling type)
- Tinnitus (roaring type)
- Ear fullness or pressure
- Nausea, vomiting, diaphoresis, pallor

Examination

- Tympanic membrane normal
- Nystagmus toward unaffected ear during acute attack
- Tuning fork tests: Rinne positive, Weber lateralizes to unaffected ear

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🧠 Differential Diagnosis

1. Vestibular neuronitis
2. Acoustic neuroma (vestibular schwannoma)

3. Benign paroxysmal positional vertigo (BPPV)
4. Otosclerosis
5. Perilymph fistula
6. Recurrent labyrinthitis
7. Viral meningitis

🔬 Investigations

Test	Findings in Meniere's Disease
Pure Tone Audiometry	Early: Low frequency SNHL (rising curve) Late: Higher frequencies affected, curve flat/falling
Speech Audiometry	Discrimination score 55–85%
SISI Test	Positive (>70%) → cochlear lesion
Tone Decay Test	Less than 20 dB
Electrocochleography	SP/AP ratio >30% (endolymphatic hydrops)

MRI	To rule out retrocochlear lesions (gold standard)
Caloric Tests	Reduced response on affected side
Glycerol Test	Improvement in hearing after oral glycerol → confirms hydrops

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🩺 Management

1️⃣ General Measures

- Reassurance
- Low-salt diet
- Avoid excess fluid intake
- Avoid caffeine, tea, alcohol
- Avoid activities requiring balance
- Stress management

2️⃣ Acute Attacks

- Bed rest

- IV fluids and electrolytes
- Vestibular sedatives:
    - Dimenhydrinate, Promethazine, Prochlorperazine
    - Diazepam or Atropine if severe
- Betahistine
- Vasodilators (e.g., Carbogen)

3️⃣ Chronic Phase

- Vestibular sedatives (Prochlorperazine)
- Betahistine, vasodilators
- Diuretics: Furosemide, Hydrochlorothiazide
- Propantheline bromide
- Treat underlying allergens/endocrine issues
- Intermittent low-pressure pulse therapy (Meniett device)
- Intratympanic gentamicin (chemical labyrinthectomy)
- Microvic therapy

4️⃣ Surgical Options

Conservative procedures (sac-sparing):

- Endolymphatic sac decompression
- Endolymphatic shunt
- Sacculotomy (Fick's operation)
- Selective vestibular nerve section

Destructive procedures:

- Labyrinthectomy (for intractable unilateral disease)

⚙️ Pathophysiology

Meniere's Disease is primarily caused by endolymphatic hydrops — an abnormal accumulation of endolymph in the membranous labyrinth.

Sequence of events:

1) Endolymphatic hydrops develops
    - Due to impaired resorption at endolymphatic sac (idiopathic or secondary)
    - Possible mechanisms:
        - Genetic predisposition (familial cases)

- Autoimmune response
- Viral infections (e.g., HSV)
- Vascular compromise in inner ear

2) Increased endolymphatic pressure

- Causes distention of scala media
- Leads to mechanical distortion of basilar membrane

3) Impact on cochlea

- Hair cells of Organ of Corti compressed → sensorineural hearing loss
- Low-frequency hair cells affected first → "rising audiogram"

4) Impact on vestibular system

- Distorted cupula of semicircular canals → vertigo attacks
- Nystagmus toward unaffected ear during acute phase

5) Rupture of Reissner's membrane (in severe cases)

- Mixing of endolymph (K^+ rich) and perilymph → sudden depolarization of hair cells
- Causes acute vertigo attack and transient hearing loss

6) Chronic phase

- Repeated hydrops episodes → permanent cochlear damage
- Progressive SNHL
- Persistent tinnitus and imbalance

Key point:

- Meniere's disease = episodic vertigo + low-frequency SNHL + tinnitus + ear fullness
- Vertigo usually lasts 20 min – 24 hr, resolves spontaneously, unlike vestibular neuronitis (single prolonged episode).

-> The End <-