Meniere’s Disease
Normal membranous labyrinth

Dilated membranous labyrinth in Meniere's disease (Hydrops)
Normal membranous labyrinth

Dilated membranous labyrinth in Meniere's disease (Hydrops)
DEFINITION

Disease of inner ear
Distention of endolymphatic system
  - Vertigo
  - Sensorineural hearing loss
  - Tinnitus
AGE DISTRIBUTION AND INCIDENCE

- 35-60 yrs
- Females : Male 3:2
- Familial
- Unilateral / bilateral
PATHOPHYSIOLOGY
Pathophysiology

Theories behind endolymphatic hydrops

- Obstruction of endolymphatic duct/sac
- Hypoplasia of endolymphatic duct/sac
- Alteration of absorption of endolymph
- Alteration in production of endolymph
- Autoimmune insult
- Vascular origin
- Viral etiology
AETIOLOGY (primary causes)

- Genetic
- Anatomical (small vestibular aqueduct)
- Traumatic (physical, acoustic)
- Viral infection (HSV type 1)
- Allergy
- Autoimmunity
AETIOLOGY (secondary causes)

- Developmental insult
- Metabolic states
  - (DM, hypothyroidism, hyperlipidaemia)
- Syphilis
- CSOM
- Otosclerosis
- Abnormal fluid balance
CLINICAL FEATURES

- Acute phase - vestibular failure with cochlear symptoms
- Periods of remission 03 – 12 months
- 03 Phases
  - Early reversible hearing loss
  - Fluctuant hearing loss
  - Late non fluctuant hearing loss
Acute Attack

- Dramatic symptoms of Vertigo
- Hearing loss and tinnitus rare
- Nausea - vomiting
- Vagal symptoms – sweating, pallor, down pulse, Faintness,
- (Unconsciousness is not a feature)
Warning sign: discomfort or aching ear
Change in hearing and tinnitus
Vague sense of uneasiness
Vertigo: to and fro, up and down
As a ship at the mercy of a stormy sea
Duration: minutes – 24 hours
Fully oriented and conscious
Nystagmus positive
Remission Phase

Early stages: entirely asymptomatic

- Normal hearing: no tinnitus & vertigo

Late stages

- Some tinnitus and hearing loss
- Imbalance, head movement, motion sickness, positional vertigo, ataxia
CLINICAL FEATURES

Vertigo
- Episodic
- Nystagmus

Hearing loss
- Sensorineural
- Progressive

Tinnitus
- Continuous / intermittent

Aural fullness
DIFFERENTIAL DIAGNOSIS

- Vestibular neuronitis
- Benign paroxysmal positional vertigo
- Vestibular schwannoma
- Vertibrobasilar insufficiency
EXAMINATION

Otoscopic:

Normal

Nystagmus:

During acute attacks

Tuning fork tests:

- Rinnie Positive
- Weber Lateralized to better ear
- ABC Reduced in affected ear

Complete neurological examination
INVESTIGATIONS

Assessment of cochlear function

- PTA

- Rising
- Flat
- Falling
INVESTIGATIONS

- Special audiometric tests
- Evoked response audiometry
- Transtympanic electrocochleography
INVESTIGATIONS

Assessment of vestibular function

Metabolic screening

- CBC-ESR
- UREA / ELETROLYTES
- VDRL / TPHA
- BSR
- GTT
- CHOLESTEROL / TG
- TFT
TREATMENT
Medicines for “ACUTE ATTACK”

• Antiemetics
  (H1 Blocker = Phenergan)
  (D2 Blocker = stemetil/Prochlorperazine.)

• Benzodiazepines
  (Lorazepam/Diazepam)

• Meclizine
  (antiemetic, CNS suppressant, muscle relaxant activity)

• Steroids
  (Dexamethasone)
“Medicines Used B/w Attacks”

- **DIURETICS:**
  - (Hydrochlorothiazide/Triamterine)

- **VESTIBULAR SUPPRESSANTS:**
  - Clonazepam
  - Lorazepam
  - Diazepam
  - Meclizine

- **Calcium channel blockers:**
  - Verapamil
  - Cinnarizine
  - Nimodipine
STEROIDS:

- Dexamethasone
- Prednisolone

(Anti-inflammatory properties probably reduce endolymphatic pressure & can help reverse vertigo & tinnitus)

Immune Suppressants:

- Methotrexate
- Steroids
Treatment Cont’d

- **Lifestyle and dietary changes:**
  - Salt-restricted diet
  - Avoid excess water intake
  - Avoiding trigger substances (e.g., caffeine, tea, alcohol) alone may be sufficient.
  - Smoking cessation also is recommended.
  - Mental relaxation exercises.
Diet:

- Similar to managing systemic hypertension, the goal for Meniere disease is to reduce the total body fluid volume. This, in turn, may reduce the inner ear fluid volume.

- Since sodium seems to play a major role in fluid retention within the inner ear, avoiding salt (e.g., pizza, preserved foods, smoked fish) is paramount.
Treatment Cont’d

• Activity:
  - Endolympathic hydrops does not preclude regular activity. Exercise is recommended in moderation.
  - Because of the unpredictable nature of the disease, balance-intensive, dangerous tasks (eg, especially climbing ladders) should be avoided.
Treatment Cont’d

- **Surgical Care:**
  Surgical therapy for Meniere disease is reserved for medical treatment failures and is otherwise controversial.

- *Surgical procedures* are divided into 2 major classifications as follows:
  - Non-destructive surgical procedures
  - Destructive surgical procedures
Nondestructive surgical procedures:

1. Endolympathic sac decompression or shunt
2. Vestibular nerve section
3. Sacculotomy / Cochleosacculotomy
4. Transtymppanic medication perfusion (Through MYRINGOTOMY)
Endolymphatic sac decompression and/or shunt

- The endolymphatic sac procedure decreases endolymph pressure accumulation by removing the petrous bone, which encases the endolymph reservoir.

- This procedure allows the reservoir sac to expand more freely, thus dissipating pressure.

- A drain or valve from the endolymphatic space to either the mastoid or subarachnoid space can be inserted as another means of further reducing pressure.
Endolymphatic Sac Surgery

- **Decompression:**
  Removal of bone overlying the sac

- **Shunting:**
  Placement of synthetic shunt to drain endolymph into mastoid

- **Drainage:**
  Incision of the sac to allow drainage

- **Removal of sac:**
  Excision of the sac
Vestibular nerve section

- For patients with useful hearing in the affected ear, sectioning the diseased vestibular nerve can be the ultimate solution.

- Although the hearing and balance functions are housed in one common chamber within the inner ear, their neural connections to the brain separate into distinct nerve bundles as they course through the internal auditory canal.

- This anatomical separation allows balance function to be isolated and ablated without affecting hearing function.
Vestibular Nerve Section

Approaches:
- Middle Fossa
- Retrolabyrinthine/Retrosigmoid
- Transcanal

Complications
- Damage to facial nerve
- Damage to cochlear nerve
- CSF leak (about 13%)
surgical procedures Cont’d

**Labyrinthectomy**

- Advantage of high cure rate (>95%)

- Useful in the patient whose hearing on the diseased side has been destroyed already by Meniere disease.

- Labyrinthectomy involves ablation of the diseased inner ear organs.

- This procedure is less complex than vestibular nerve section because labyrinthectomy does not require entry into the cranial cavity.

- Labyrinthectomy is less invasive than vestibular nerve section.
Labyrinthectomy

Approaches:
- Transcanal
- Transmastoid
Chemical Labyrinthectomy

- Persistent & refractory sx
- IM streptomycin
- Intratympanic gentamicin
  - round window & annular ligament
  - properly counselled
THANK YOU
History

1861 – Prosper Meniere describes classic symptoms

1938 – Hallpike and Portman confirm endolymphatic hydrops