Acoustic Neuroma and Glomus tumor

Dr Hitesh Verma
Anatomy
Acoustic neuroma on vestibulocochlear nerve puts pressure on facial nerve.
Pathology

- Firm, well encapsulated
- Microscopically shows two type of characteristic pattern- Antoni type A & B
  - Antoni A- orderly arrangement of parallel cells with dark staining fusiform nuclei arranged in bundles or whorls separated by relatively acellular fibrous tissue
  - Antoni B- loose reticular arrangement with fewer cellular elements and more disorderly arranged nuclei
Clinical features

- 5 stages

I. Otological stage - changes confined to vestibulocochlear and to limited extent facial nerve. It includes all intrameatal tm and extrameatal tm < 2 cm

II. Trigeminal N involvement - ≥ 2 cm

III. Brain stem and cerebellar compression

IV. Rising intracranial pressure

V. Terminal stage
Clinical features

Hearing loss

• Usually patient present with a gradual, progressive, unilateral, or asymmetrical high frequency sensorineural hearing loss

• sudden onset sensorineural hearing loss

Tinnitus

• It is usually high pitched, continuous, and unilateral or asymmetric

Vertigo
Clinical features

- Trigeminal nerve dysfunction
- It manifest as hypesthesia, paraesthesia, or rarely anaesthesia, typically in the mid-facial region
- Absent corneal reflex
Clinical features

Facial nerve dysfunction

- The weakness is typically gradual in onset
- 10%
- Histelberger’s sign - hypesthesia of the concha or external auditory canal floor. This is because the sensory fibers are less resistant to the effect of compression and consequently manifest earlier
Diagnostic Testing

Audiogram

• Unilateral or asymmetrical sensorineural hearing loss

• U-shaped or low tone patterns of loss are less common
Diagnostic Testing

Tympanometry

- Absent stapedial reflex
- Stapedial reflex decay (greater than 50% return to base line in 10 sec)
Diagnostic Testing

- Electronystamography determine whether the inferior of superior vestibular nerve is the site of origin for the vestibular schwannoma
- Caloric testing reveals the status of the horizontal semicircular and the superior vestibular nerve
Diagnostic Testing

Auditory brain stem response

- It is a sensitive test with a sensitivity of 90% to 100%
- The specificity of ABR testing ranges from 54% to 78%
Imaging

**FIGURE 25-3** Intracanalicular vestibular schwannoma with a cisternal component. A and B, T1-weighted axial and coronal images after gadolinium enhancement. A well-defined mass shows marked enhancement without enlargement of the IAC. C, Axial CISS images. Tumor and adjacent fine anatomic structures as well as the fundus of the IAC are delineated in this sequence. The cochlea has high signal.
Treatment options

- The treatment options
  - surgical resection
  - radiation therapy
  - observation
- Observation with sequential MRI
  - only hearing ear
  - in patients with advanced age and limited life expectancy,
  - significant cardiovascular, pulmonary, or other systemic diseases
• Stereotactic radiation therapy
  • Indications
    • Small tumors > 3 cm
    • Functional hearing
    • Older patients
    • Medically unstable patients
    • Previous resection
Surgical treatment

- Surgical treatment
- The choice of approaches to the resection of vestibular schwannoma and other CPA tumor is guided by the degree of residual hearing, hearing status in the contralateral ear, location of the tumor, size of the tumor, cell type, and age of the patient.
Trans-labrynthine

- Indications
  - Non-serviceable hearing

Figure C. As a tumor reaches medium size (between 1 and 3 centimeters in diameter) it extends out of the internal auditory canal and grows toward the brain stem. The larger tumors in this category make contact with the brain stem and other sensitive nerves.

FIG. 1. An incision is created 3 cm posterior to the postauricular crease and extended 1 cm above the superior aspect of the helix. The incision is carried down to the temporalis fascia superiorly and the periosteum covering the mastoid cortex inferiorly. Parallel, horizontal incisions are created above and below the level of the external auditory canal. The incisions extend 2 cm posteriorly, at which point they are connected by a vertical incision.
Retrosigmoid

- Indications
  - Serviceable hearing
  - Large tumors
  - Compression of brainstem
Middle Fossa

- Indications
  - Small tumor
  - Intracanallicular tumor
  - Moderate CPA involvement
  - Adequate hearing (SRT<50 db, Disc >50%)
Complication of surgeries

• Though many complications occur, the important one include
• Intraoperative
  Cranial nerve injury- VII, V,
  Bleeding
  Brain edema
  Venous air embolism
  Cardiac arrhythmias
  Brain herniation
Identify the picture
• Another name?

• Award and year?
Identify
Nature interpretation centre, Chandigarh
Logo represent?
Massage

Please VOTE
Anatomy and Function of Paraganglia

Three bodies in each ear

- Jacobson’s nerve
- Arnold’s nerve
- in the adventitia of the jugular bulb
- blood supply is ascending pharyngeal artery via inferior tympanic and neuromeningeal branches
Clinical features

- second most common temporal bone tumor (after acoustic neuroma)
- female: male ratio 5:1
- median age 50-60 yrs (range 6 mo - 88 yrs)
- very slow growing
- spread locally in multidirectional fashion along paths of least resistance
Clinical features

- Sign and symptoms can be divided into 3 types.
- Those due to presence of tympanic membrane (TM) in the middle ear: conductive hearing loss (HL), aural polyp, and aural discharge.
- Those due to the vascularity of the TM: pulsatile tinnitus, aural bleeding.
Evaluation

- question pt regarding symptoms of secretng tumor (labile B/P, tachycardia, vascular HA)
- any suspicion, obtain urine for VMA, circulating catecholamines
- if positive, get abdominal CT to r/o concomitant adrenal pheochromocytoma
Evaluation

- obtain audiogram
Evaluation

- imaging should include CT temporal bone and MRI
arteriography is helpful if surgery is planned
helps in detecting multicentric tumors, identifies feeding vessels, allows for embolization
Differential diagnosis

- Dehiscent or high riding jugular bulb
- Aberrant or laterally displaced ICA
- Acquired intratympanic carotid A aneurysm
Treatment planning

• in general, healthy younger pts (<65 yrs) should consider surgical resection
• pts with large tumors with pre-existing ipsilateral CN deficits should be offered surgery
• pts >65 with poor pulmonary fxn or other complicating medical conditions should consider primary XRT
### Surgeries

<table>
<thead>
<tr>
<th>Anatomic classification</th>
<th>Surgical approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tympanic</td>
<td>Transcanal</td>
</tr>
<tr>
<td>Tympanomastoid</td>
<td>Mastoid-extended facial recess</td>
</tr>
<tr>
<td>Jugular bulb</td>
<td>Mastoid-neck (possible limited Facial n rerouting)</td>
</tr>
<tr>
<td>Carotid artery</td>
<td>Infratemporal fossa</td>
</tr>
<tr>
<td>Transdural</td>
<td>Infratemporal fossa/intracranial</td>
</tr>
</tbody>
</table>

- Classification scheme devised by Antonio De la Cruz
Transcanal approach
FIG. 9. Extended facial recess exposure of a tympanicum tumor that has extended into the hypotympanum. The retrofacial air cells have been removed to expose tumor medial to the facial nerve.
Fisch approach

Figure 11. GJ tumor incision. The vertical dissection is executed only for temporoparietal fascia.
Figure 12. Distal control of ICA in small tumors can be achieved allowing for hearing conservation.
Thank you.......