SELF ASSESSMENT MODULE ON HEAD & NECK IMAGING: TEMPORAL BONE AND TINNITUS
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SELF ASSESSMENT QUESTIONS WITH RATIONALE & REFERENCES

Lecture 1 & 2: Temporal Bone Imaging Part 1 & 2, Hugh D. Curtin, MD

QUESTION 1: In the middle ear, the facial nerve normally passes:
   A) between the malleus and scutum
   B) inferior to the lateral canal and superior to the oval window.
   C) inferior to the stapes along the promontory
   D) inferior to the crista falciformis

Correct Answer = B

Rationale: The facial nerve passes from the geniculate posteriorly through the middle ear. The nerve passes just inferior to the lateral semicircular canal and just superior to the oval window. This is one of the most important anatomic relationships in the temporal bone.

QUESTION 2: The interscalar septum separates the:
   A) the vestibule from the cochlea.
   B) scala tympani from scala vestibuli of the basal turn.
   C) one turn of the cochlea and the next.
   D) the facial nerve from the superior vestibular nerve.

Correct Answer = C

Rationale: The interscalar septum is the bony structure that curls through the cochlea. This osseous structure separates each turn of the cochlea from the next passing between the scala vestibuli of one turn from the scala tympani of the next.

QUESTION 3: A lesion expands the petrous apex and is high signal on T1 weighted MRI.
The most likely diagnosis is:
   A) primary epidermoid
   B) melanoma
   C) lipoma
   D) cholesterol cyst

Correct Answer = D

Rationale: The cholesterol cyst contains blood products and typically has high signal on T1 weighted images. There can be areas of low signal representing hemosiderin. An epidermoid is has low signal on T1 WI. Lipoma or melanoma (metastatic) would be very unusual.

QUESTION 4: Cholesterol cyst arises from:
   A) air cells of the petrous apex.
   B) the bone of the apex.
   C) The petroclival synchondrosis.
   D) the internal auditory canal.
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**Correct Answer = A**

**Rationale:** The cholesterol cyst is an expanded petrous air cell. When an air cell is obstructed there is initially an effusion but hemorrhage or microhemorrhage can occur. When there is expansion, the lesion is called a cholesterol cyst or cholesterol granuloma.

**References for Questions 1-4**

**Lecture 3: Imaging of Tinnitus**, John L. Go, MD

**QUESTION 5:** Objective tinnitus is defined as the following:

- a. Perception of sound heard by the patient only.
- b. Perception of sound heard by the patient and the examining physician.
- c. Perception of sound which follows the patient's heart rhythm.
- d. Perception of sound which goes away with compression of the ipsilateral internal jugular vein.
- e. None of the above.

**Correct Answer = B**

**Rationale:**
- a. Subjective tinnitus is defined as the perception of sound heard by the patient only.
- b. Correct answer. Objective tinnitus is defined as the perception of sound heard by the patient and by the examining physician.
- c. Pulse synchronous tinnitus is defined as the perception of sound which follows the patient's heart rhythm.
- d. Non-pulse synchronous tinnitus is the perception of sound by the patient which disappears with compression of the ipsilateral internal jugular vein.
- e. None of the above.

**References:**

**QUESTION 6:** Which of the following lesions does not cause pulse synchronous tinnitus:

- a. Arteriovenous malformation
- b. Hemangioma
- c. Jugular bulb diverticulum
- d. Fibromuscular dysplasia
- e. Carotid dissection
Correct Answer = C

Rationale: Pulse synchronous tinnitus is due to arterial pulsations with direct transmission of sound waves to the cochlea which may cause subjective or objective tinnitus. Non-pulse synchronous tinnitus is recognized as a constant humming sound by the patient which vanishes upon compression of the internal jugular vein and result from a venous lesion. The correct answer is C, jugular bulb diverticulum, which represents an outpouching of the jugular bulb. The remaining lesions have arterial components.

References:

QUESTION 7: Regarding objective tinnitus, the best imaging study should be:
   a. CT
   b. MRI
   c. Angiography
   d. A and B
   e. None of the above

Correct Answer = C

Rationale: Unlike subjective tinnitus which may be multifactorial in nature, objective tinnitus is due to a vascular lesion, likely a dural arteriovenous fistula. Angiography is the gold standard in assessing AV fistula, though CTA or MRA may aid in the diagnosis.

References: