ICRI CASE OF THE WEEK

Contributed By:
Dr. M. Sarthak Swarup, Dr. Jyoti Kumar

Maulana Azad Medical College, New Delhi

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Clinical Details

• A 30 year old female presented with left hemifacial pain for last 1 year
• The pain was paroxysmal, sudden in onset, excruciating in nature lasting from few second to several minutes, most often triggered by talking, brushing teeth, chewing, drinking and touching face
• A clinical diagnosis of Trigeminal Neuralgia was made
• The patient was referred for MRI scan for evaluation of cause of her symptoms
Axial T2 W MR images (a, b) and Post contrast axial T1W MR image (c)
Thin section axial CISS (Constructive Interference In Steady State) MR images
Non contrast axial bone window (a, b), axial thin MIP (c) and coronal MPR (d) CT images
WHAT IS YOUR DIAGNOSIS?
Axial T2 W MR images (a, b) of the patient show a small welldefined extraxial focal lesion (red arrow) in anterior part of left Cerebello pontine angle cistern adjacent to cisternal segment of left trigeminal nerve (blue arrow). The lesion appears intensely hypointense on T2W and T1W MR images. Post contrast axial T1W MR image (c) shows no abnormal enhancement along the visualised cisternal segment of left trigeminal nerve (blue arrow).
Thin section axial CISS (Constructive Interference In Steady State) MR images of the same patient better demonstrates the lesion and its relation to left trigeminal nerve. The lesion (red arrow) appears intensely hypointense similar to adjacent petrous temporal bone and closely adherent to it. The lesion (red arrow) closely abuts and compresses the anterior part of cisternal segment of left trigeminal nerve (blue arrow).
MR findings...

- MR imaging of the patient demonstrated the cause of the patient's symptoms of left sided Trigeminal neuralgia (i.e Secondary)
- Conventional and high resolution MR images revealed a well defined extra axial focal lesion (approx size 10 x 6 mm) in left cerebello-pontine/prepontine cistern closely adherent to left petrous apex and abutting the cisternal segment of left trigeminal nerve
- MRI appearance: T1 hypointense; T2 hypointense; No enhancement
- Differential diagnosis:
  1. Calcified petro-clival meningioma
  2. Osteoma of petrous temporal bone
- Corelative Non contrast CT scan was acquired of the temporal region
Non contrast axial bone window (a, b), axial thin MIP (c) and coronal MPR (d) CT images of the same patient revealed a high density oval shaped osseous mass lesion arising from the inner aspect of the left petrous temporal bone near its apex into the adjacent subarchnoid cisternal space. Findings are consistent with Osteoma.
Diagnosis

Petrinous bone Osteoma causing Trigeminal Neuralgia
• Osteomas are benign bony head and neck neoplasms usually seen in the fronto-ethmoidal region
• Temporal bone osteomas are rarely seen; commonly arise from mastoid part; Petrous osteomas are even rarer
• Temporal bone osteoma may be of three types:
  1) Ivory type consisting primarily of compact bone
  2) Cartilage type consisting of osseous and cartilage elements
  3) Cancellous or fibrous type consisting of spongy bone or fibrous stroma (also known as osteoid osteoma) - rarest
• More commonly presents in young adults
• Osteoma of temporal bone may sometimes cause neurological symptoms like sensory neural hearing loss, vertigo and tinnitus

• Trigeminal Neuralgia (TN) secondary to petrous bone Osteoma is extremely uncommon; only two case reports and one case series of 4 cases reported in literature

• Surgical decompression is an effective treatment for patients with petrous bone Osteoma and associated TN

• CT is of great importance for the diagnosis of Osteoma involving the temporal bone especially bone window and multiplanar images

• 3D CT is very useful in the preoperative planning

• MRI is used to provide additional information and to rule out other causes of TN
Imaging of petrous bone Osteoma

- Imaging appearance varies with type of osteoma

**CT**: Demonstrates origin and continuity of the lesion with normal petrous bone

- Sharply-defined, pedunculated, osseous lesion arising from petrous bone showing peripheral dense cortical bone with or without central lucency (due to fibrous or spongy tissue)

**MRI**: Demonstrates the relationship of the lesion with trigeminal nerve and mass effect on adjacent brain stem or cerebellum

- Extra-axial, hypointense lesion with T2-blooming effect (Cortical bone)
- May or may not show central area of variable intermediate or hyperintensity on different image sequences (fatty or spongy marrow)
- Most ivory osteomas are intensely hypointense on both T1W and T2W images with no enhancement on post contrast scan
- Enhancement may be demonstrated if vasa vasorum exists in the lesion (may be misdiagnosed as malignant bone tumors)
CONCLUSION

• We described a very rare and peculiar case of unusually located osteoma of the inner surface of petrous bone appearing as a cerebellopontine angle tumor with the unusual presentation of trigeminal neuralgia

• Diagnosis of TN is essentially clinical. Imaging is used for evaluation of the etiology

• MRI is the imaging modality of choice for demonstration of trigeminal nerve and associated pathologies

• Though CT has limited role; our case emphasizes the role of CT particularly for the evaluation of bony lesions

• Response to medical therapy for TN does not rule out intra cranial pathology