Neoplasms of the Central Skull Base

- Central skull base neoplasms that are not in the sella

Disclosures:
1. ... I got nothing … 😊

- Understand complex CT and MRI imaging advantages of neoplasms of the central skull base
- Recognize neoplasm pathology of the central skull base
- Understand the imaging characteristics of common neoplasm pathology

Unknown Case

Unknown Skull Base Lesion?
• IMPRESSION:
• Large enhancing central skull base mass, as detailed above. Differential considerations include chordoma (including chondroid), chondrosarcoma, lymphoma and invasive pituitary macroadenoma. Based upon ADC values, plasmacytoma/myeloma and metastatic deposit are thought less likely. This does not appear to originate from the nasopharynx. Nasopharyngeal carcinoma and histiocytosis are less likely differential consideration.

• Differential considerations include
  – Chordoma
  – Chondrosarcoma
  – Lymphoma
  – Invasive pituitary macroadenoma
  – Plasmacytoma/myeloma
  – Metastatic
  – Nasopharyngeal carcinoma
  – Histiocytosis

Central Skull Base Pathology

- Fibrous Dysplasia
- Metastasis
- Meningioma
- Multiple Myeloma
- Lymphoma
- Pituitary Macroadenoma
- Arachnoid Granuloma
- Dendritic cell histiocytosis
- Chordoma
- Osteodystrophia deformans
- Chondrosarcoma

Neoplasms of the Central Skull Base

- Both CT and MRI often performed
  – CT without contrast bone algorithm for osseous evaluation
  – Contrasted MRI for soft tissue evaluation
Metastasis
• Metastasis
  – Patient with known malignant neoplasm
  – CT: Lytic, destructive lesion of skull base
  – MR: May have associated soft tissue mass
    • Look for multiple lesions

Meningioma
• Meningioma
  – Elderly female patient
  – Uniform enhancement on CT or MR unless lesion significantly calcified
  – CT: May see calcifications or high density
    • Bony changes may include hyperostosis, erosion, or permeative destruction
  – MR: Isointense with brain on most sequences

Multiple Myeloma
• Multiple Myeloma

Lymphoma
• Lymphoma

Pituitary Macroadenoma
• Pituitary Macroadenoma

Dendritic cell histiocytosis
• Dendritic cell histiocytosis

Chordoma
• Chordoma

Chondrosarcoma
• Chondrosarcoma

Neoplasms of the Central Skull Base

Metastases

Meningioma

Neoplasms of the Central Skull Base
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- **Meningioma**
  - Multiple lesions
  - Imaging identical to plasmacytoma
  - CT: Primarily osteolytic

- **Multiple Myeloma**
  - Multiple lesions
  - Imaging identical to plasmacytoma
  - CT: Primarily osteolytic

- **Lymphoma**
  - May be primary bone disease, or from dura
  - Wide range of appearances
  - Typically enhance uniformly
  - Dural-based disease is common
  - Can involve bone with destructive changes, extensive soft tissue mass
Neoplasms of the Central Skull Base

- Nasopharyngeal carcinoma
  - Squamous cell carcinoma at nasopharynx
  - Two patterns:
    - Direct cephalad extension into central skull base and/or cavernous sinus
    - Perineural extension into cavernous sinuses, such as along CNV2

Lymphoma

Nasopharyngeal Carcinoma

Nasopharyngeal Carcinoma

Nasopharyngeal Carcinoma

Nasopharyngeal Carcinoma

Nasopharyngeal Carcinoma
Nasopharyngeal Carcinoma

Pituitary Macroadenoma

Neoplasms of the Central Skull Base

- Pituitary macroadenoma
  - May occasionally extend inferior into clivus
  - Evaluation of sella is key; normal pituitary gland excludes this differential
  - Abnormal pituitary gland and sella characteristic
  - May see simultaneous suprasellar extension of macroadenoma
Neoplasms of the Central Skull Base

- Dendritic cell histiocytosis
  - May be multifocal disease
  - Evaluate pituitary area
  - Infundibular involvement possible
  - CT: Destructive soft tissue mass
  - MR: Best to assess for sellar disease

Neoplasms of the Central Skull Base

- Chordoma
  - Patient may present with CN6 palsy
  - CT: Destructive lesion of clivus with occasional bony spicules left behind by aggressive growth
  - MR: Characteristic T2 hyperintense signal may be seen
Chondrosarcoma
- Arises in skull base fissures, synchondroses
- Petro-occipital fissure most common
- CT: “Arcs & whorls” of calcification (50%)
- MR: High signal intensity on T2, intense enhancement on post-contrast T1
Chondrosarcoma

Postoperative CT

Postoperative MRI

Preop T2           Postop T2
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Extra-Sellar Neoplasms of the Central Skull Base

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