

Magnetic Resonance (MR) and Computed Tomography (CT) Imaging of Pathological Entities of the Cavernous Sinus: A Pictorial Review

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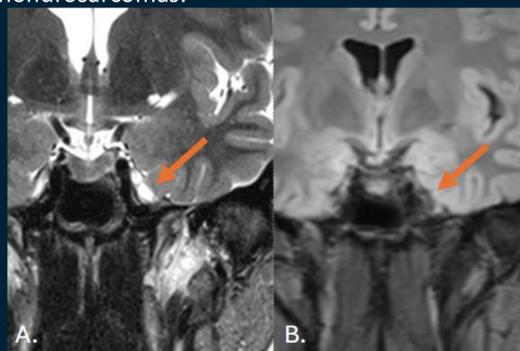


INTRODUCTION

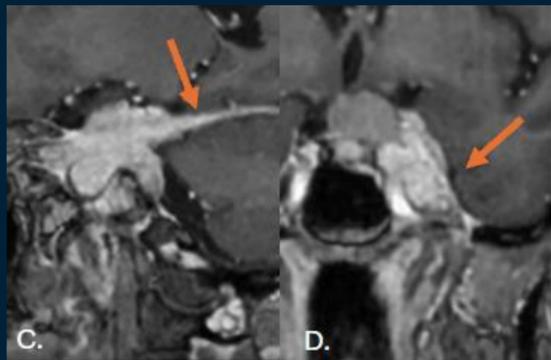
The cavernous sinus (CS) represents a highly complex venous structure located at the skull base, with intimate relationships to critical neurovascular structures, as well as the pituitary gland and adjacent sphenoid sinus. Because of these intricate anatomical associations, a wide spectrum of pathologies—ranging from infective, inflammatory, granulomatous, vascular and neoplastic causes—can arise within or extend into the cavernous sinus, often leading to significant morbidity. These lesions are not always biopsy-amenable, therefore cross-sectional imaging plays a crucial role in characterizing the underlying etiology, determining disease extent, assessing complications, and guiding management.

Benign Tumors

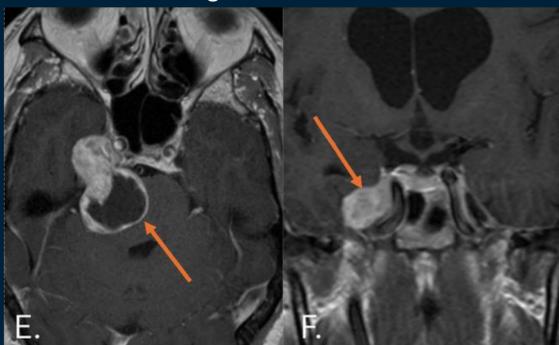
Most common benign tumors of the cavernous sinus includes meningiomas, pituitary adenomas, schwannomas, cavernous hemangiomas, neurofibromas, juvenile angiofibromas, dermoid tumors, epidermoid tumors, chordomas and chondrosarcomas.



Arachnoid Cyst. A-B) Well-defined nonenhancing fluid signal masses with complete FLAIR suppression



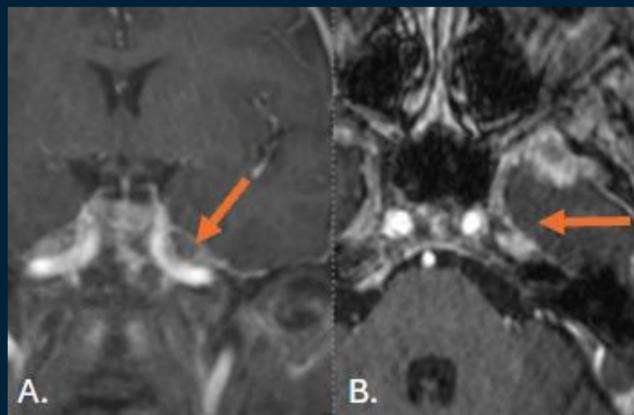
Meningioma. C-D) Homogenous enhancing well-defined mass, T2 hyper/isointense, can present with ICA narrowing and dural tail.



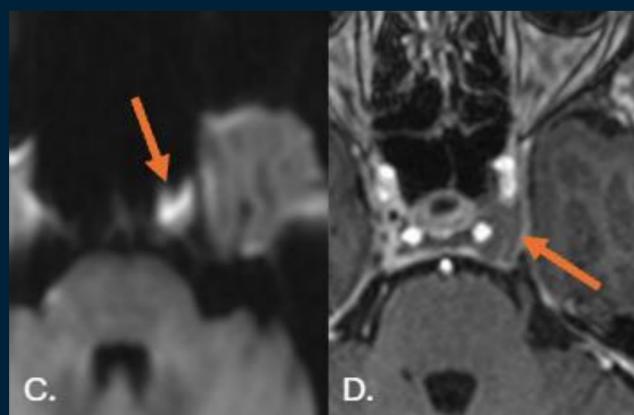
Schwannoma. E-F) Enhancing T2 heterogeneous mass, may contain cystic degeneration and hemosiderin.

Malignant Tumors

Most common malignant tumors of the cavernous sinus includes metastasis, direct extension from adjacent malignancies, chondrosarcomas, lymphoma.



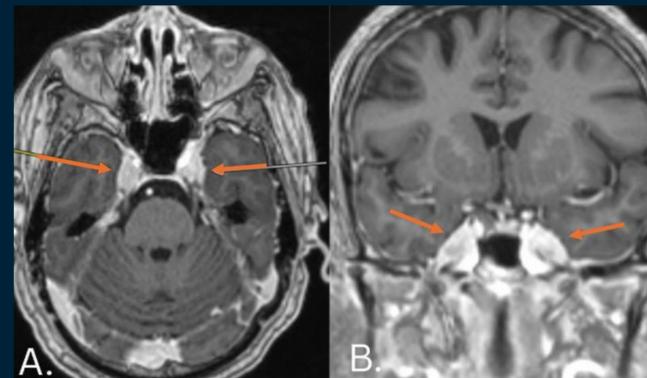
Metastasis. A-B) Enhancing mass with aggressive behaviour invading adjacent meninges and with bone destruction.



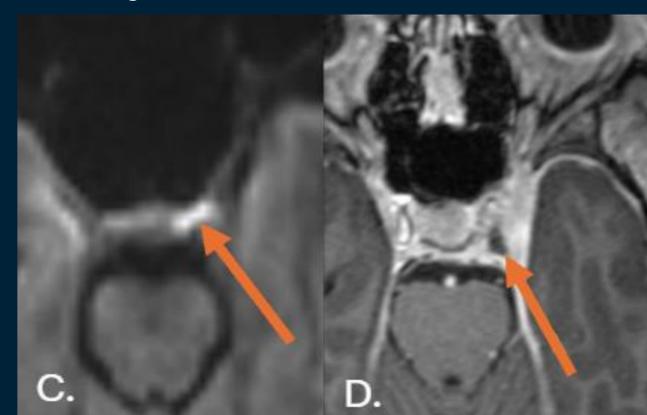
Lymphoma. C-D) T1 hypointense mass usually associated with intense restricted diffusion.

Inflammatory/Infectious Processes

Most common inflammatory and infectious processes of the cavernous sinus includes septic thrombosis, fungal infection, Tolosa-Hunt, sarcoidosis, IgG4-related diseases.



Neurosarcoidosis. A-B) Symmetric enhancing masses of the CS, usually associated with symmetric meningeal thickening and enhancement.



Abscess. C-D) T1 hypointense mass with associated restricted diffusion.

Diagram Diagnostic algorithm for imaging-based differential diagnosis of cavernous sinus lesions

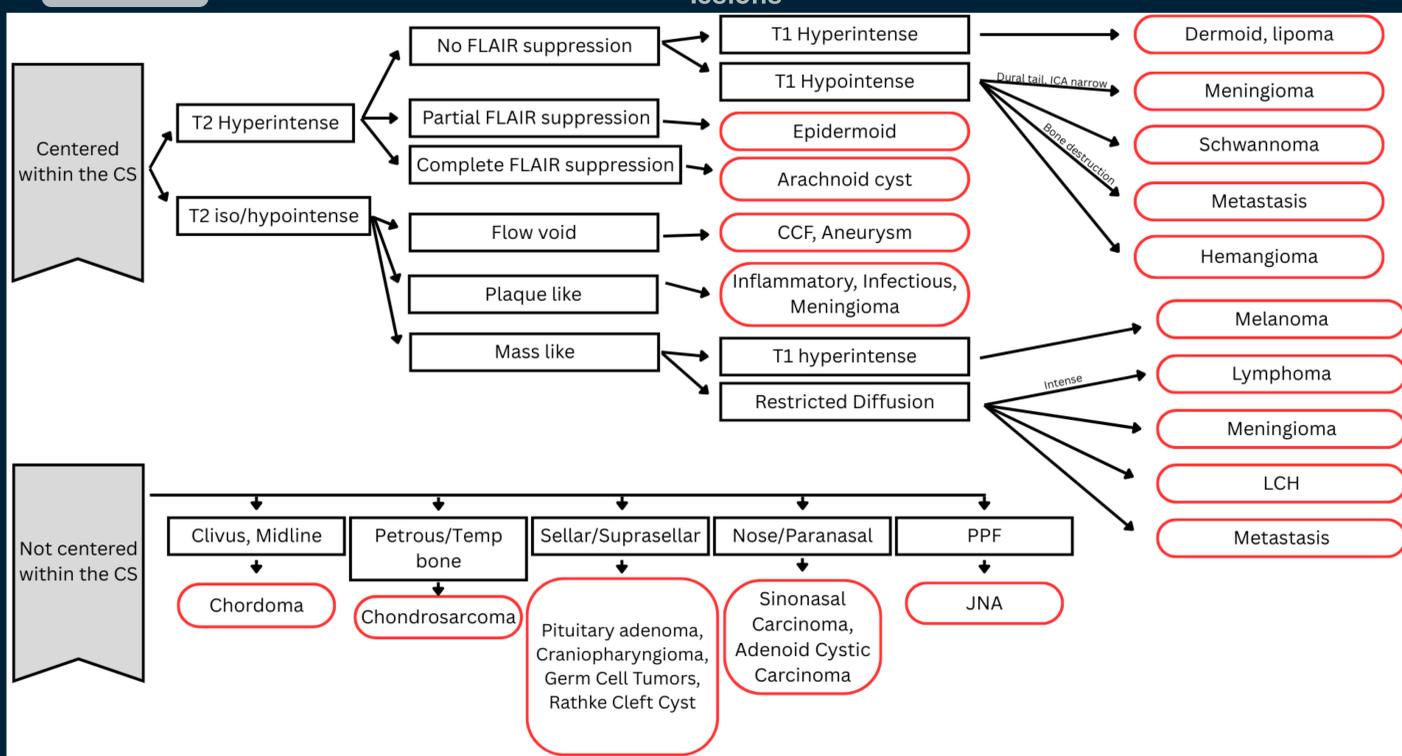


Diagram 1. CS= Cavernous Sinus; JNA = Juvenile nasopharyngeal angiofibroma; LCH = Langerhans cell histiocytosis; PPF = Pterygopalantine Fossa

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Mahalingam HV, et al. Imaging Spectrum of Cavernous Sinus Lesions with Histopathologic Correlation. Radiographics. 2019 May-Jun;39(3):795-819. doi: 10.1148/rg.2019180122. Epub 2019 Apr 12. PMID: 30978149.