Beyond the Sinuses: Radiologic Findings of Sinusitis-Related Intracranial Complications

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Introduction:
Intracranial complications from sinusitis are rare, but potentially fatal, and are important for radiologists to identify on cross-sectional imaging to guide treatment plans. Our educational exhibit will discuss the various etiologies of paranasal sinus infections, as well as the epidemiology related to susceptible populations. We will then discuss the relevant paranasal sinus anatomy and the routes of intracranial extension, such as direct and venous spread. Then, our educational exhibit will discuss the CT and MRI findings of sinusitis and the secondary intracranial complications (Figs. 1-4). With each case of sinusitis with intracranial extension presented, a multidisciplinary treatment plan will be discussed, including medical and surgical components. The purpose of our educational exhibit is to provide a review of the imaging features of sinusitis-related intracranial sequelae and to highlight the role of the radiologist within the multidisciplinary treatment team.

Figures Demonstrating Intracranial Sequelae of Sinusitis:

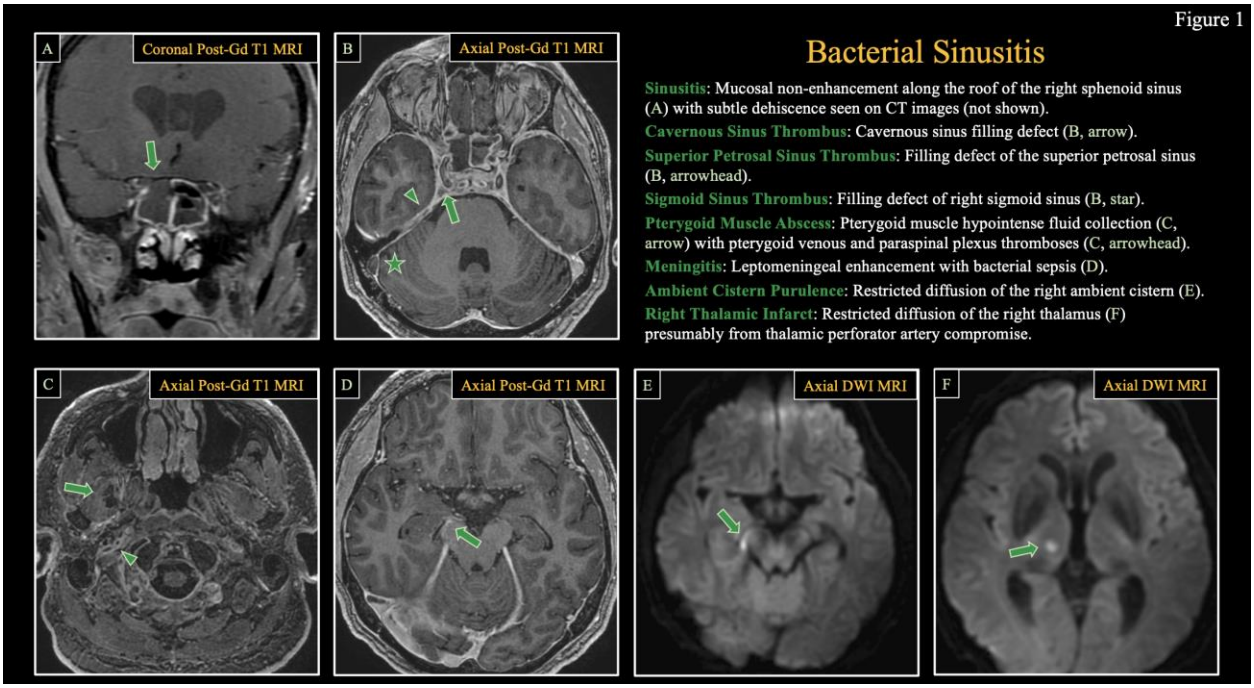

Figure 1 – Bacterial Sinusitis: 52-year-old male with a recent upper respiratory infection who presented with headache and ataxia and was found to have bacterial meningitis on lumbar puncture. Patient underwent functional endoscopic sinus surgery (FESS) with otolaryngology and made a good recovery after completing intravenous antibiotics.

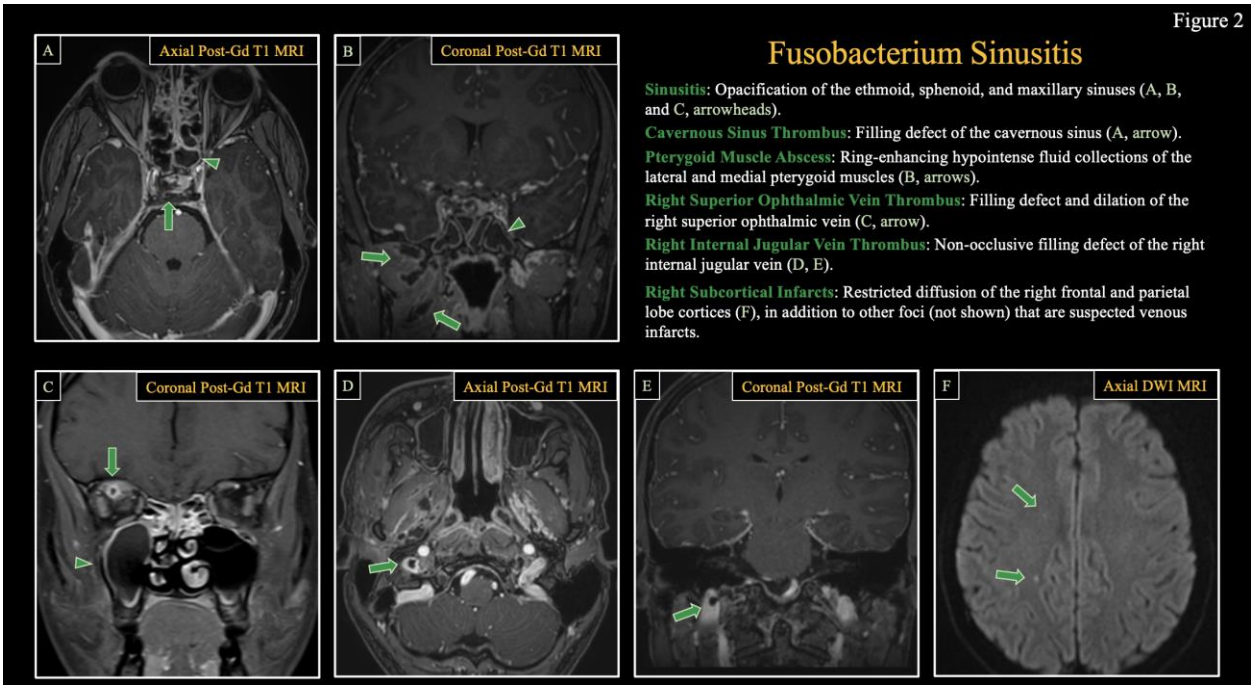

Figure 2 – Fusobacterium Sinusitis: 20-year-old male with recent upper respiratory infection who presented with worsening facial pain and was found to have *Fusobacterium necrophorum* bacteremia. Patient underwent treatment with intravenous antibiotics and made a good recovery.

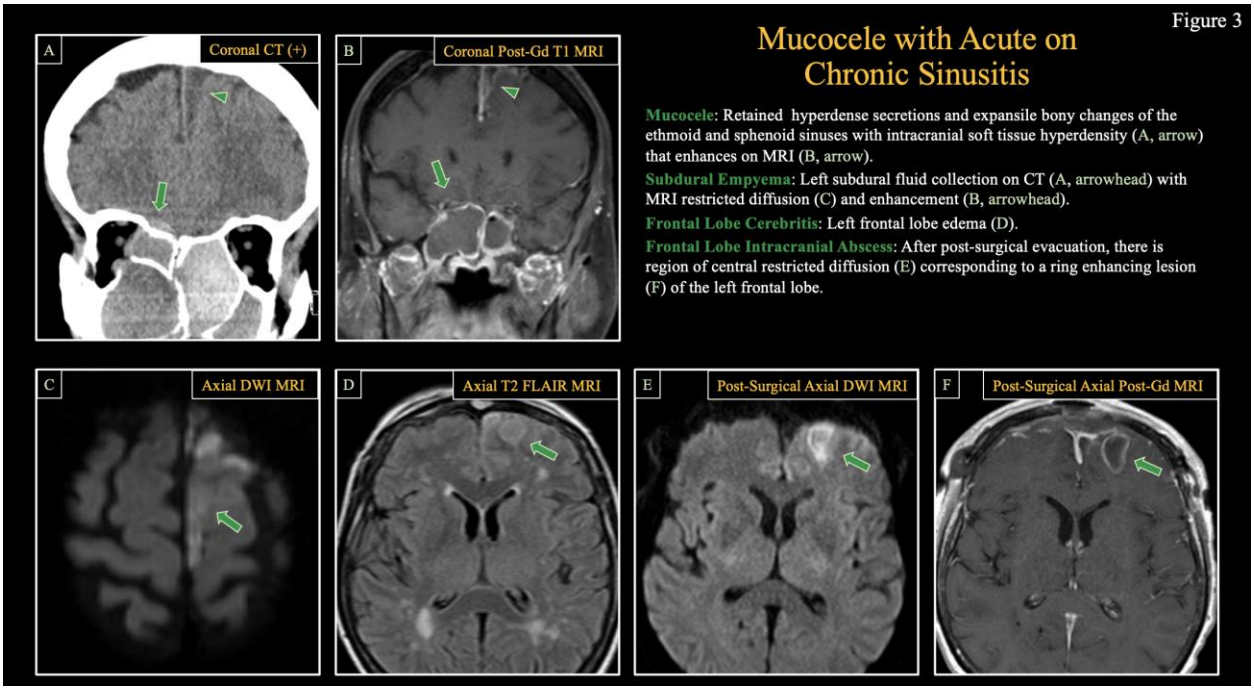

Figure 3 – Mucocele with Acute on Chronic Sinusitis: 73-year-old female with recurrent sinus infections secondary to nasal polyps who presented with lethargy and seizures and was found to have bifrontal abnormalities on EEG. Patient made a good recovery undergoing FESS and bifrontal craniotomy and evacuation and was treated with intravenous antibiotics.

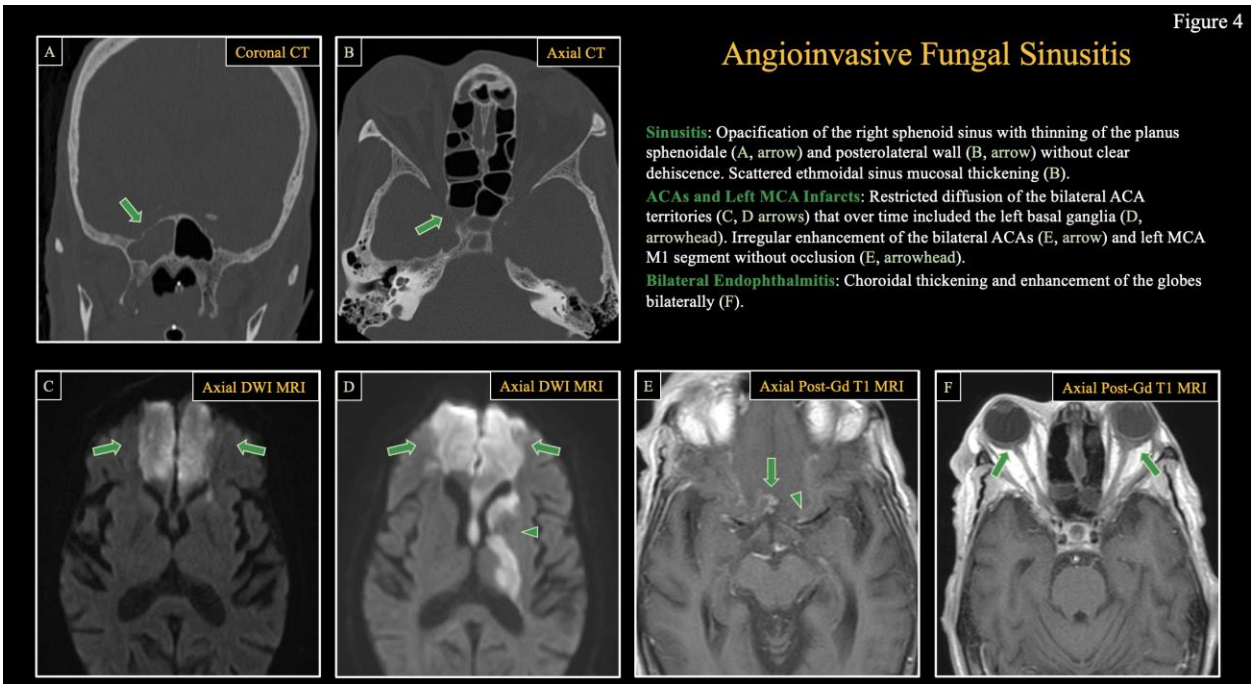

Figure 4 – Angioinvasive Fungal Sinusitis: 75-year-old female with a history of diabetes mellitus who presented with diabetic ketoacidosis and cardiogenic shock and was diagnosed with necrotizing invasive fungal sinusitis from sinus debridement surgical specimens with otolaryngology. Patient was also treated with intravenous antifungal medications and passed away while in hospice.

Conclusion:

Sinusitis can result in life-threatening intracranial complications and the radiologist is a key member of the multidisciplinary treatment team by identifying the cross-sectional imaging findings of sinusitis-related intracranial complications.

References:

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