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Imaging complicated acute sinonasal and dental infections

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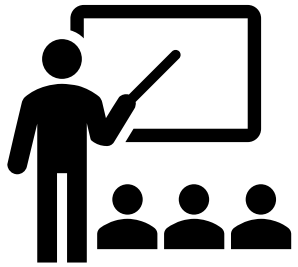
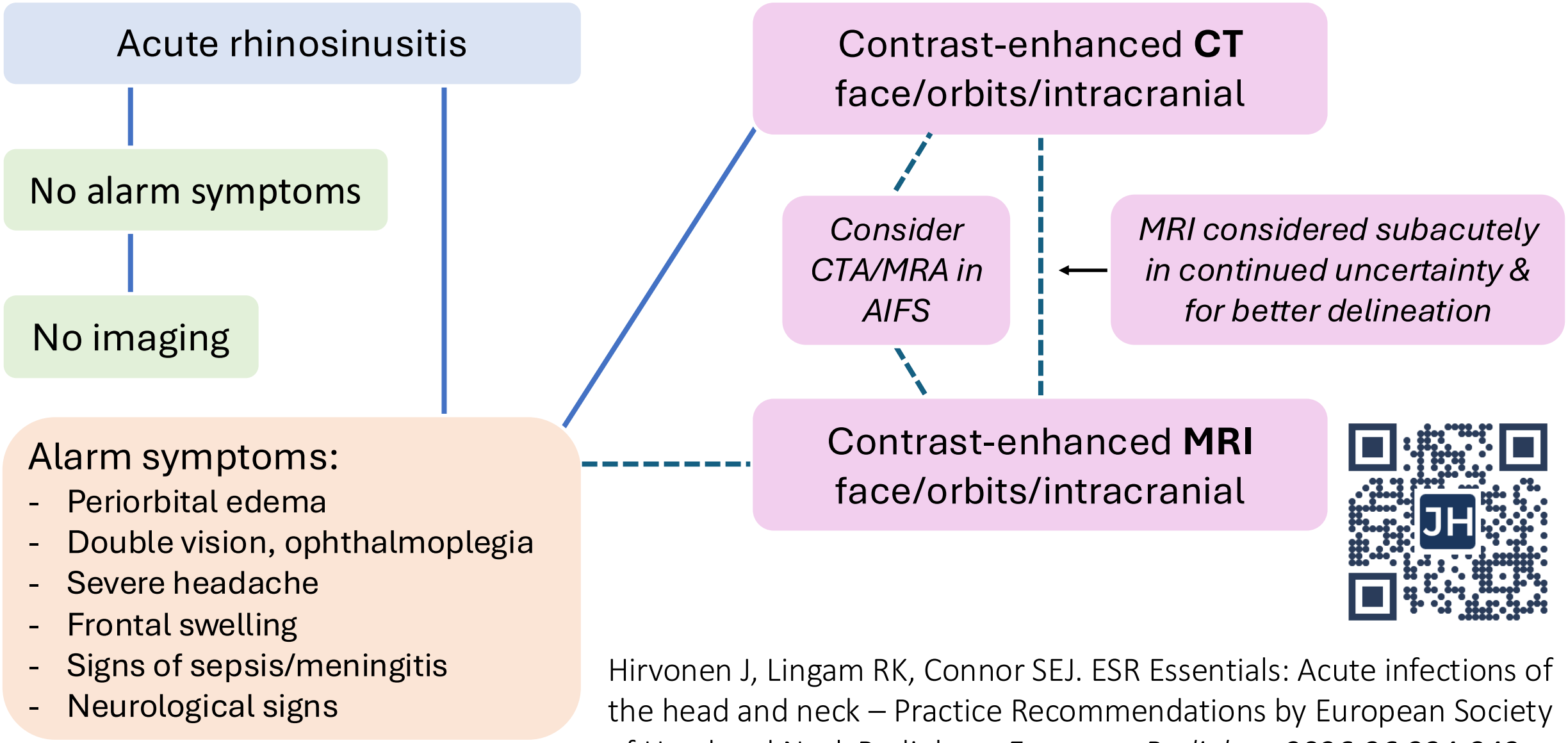
No disclosures

Learning objectives



1. To recognise the imaging features of complicated acute sinonasal infections, including extension beyond the sinuses and involvement of adjacent structures on CT and MRI.
2. To understand the role of imaging in differentiating sinonasal infections from dental infections and identifying potential complications such as abscess formation or osteomyelitis
3. To develop a diagnostic checklist of not-to-be-missed findings to guide timely and appropriate management of complicated sinonasal and dental infections

Diagnostic imaging flowchart in acute rhinosinusitis

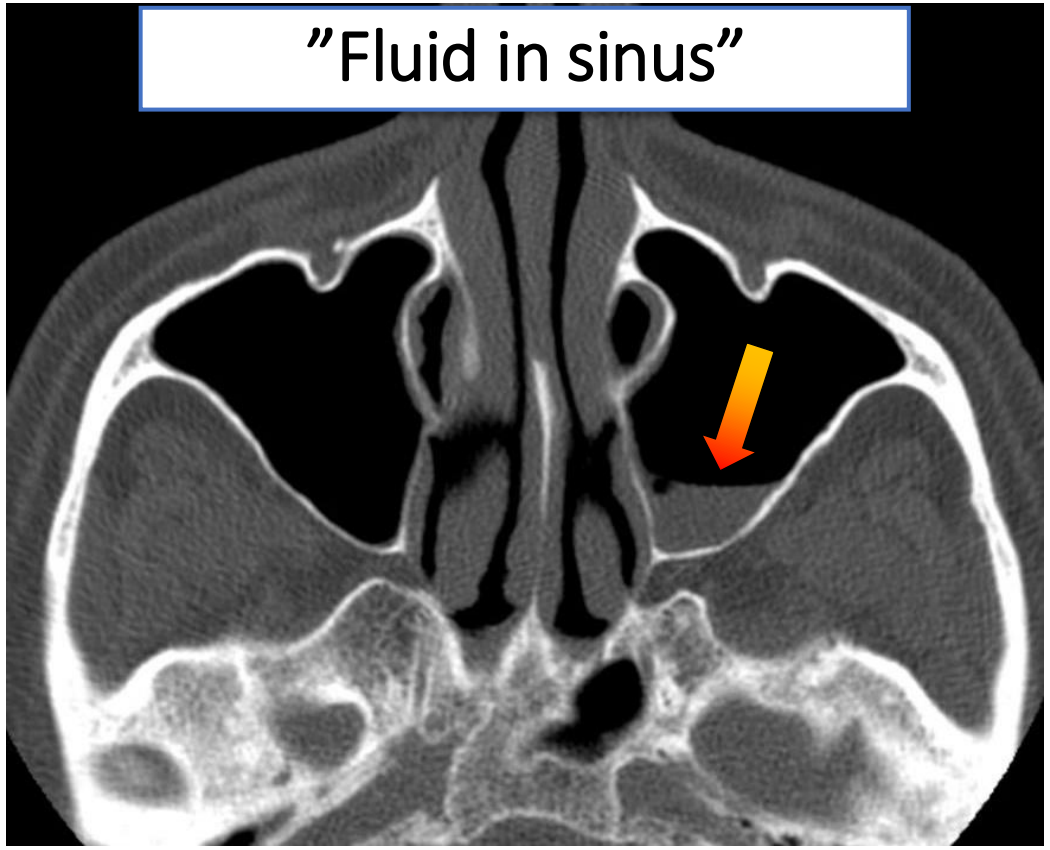


Hirvonen J, Lingam RK, Connor SEJ. ESR Essentials: Acute infections of the head and neck – Practice Recommendations by European Society of Head and Neck Radiology. *European Radiology* 2026;36:334-343

Acute rhinosinusitis is a clinical diagnosis

Imaging findings are neither

Necessary	**Sufficient**
Diagnosis made clinically	*Findings non-specific Do not differentiate viral vs. bacterial*



Clinical context matters

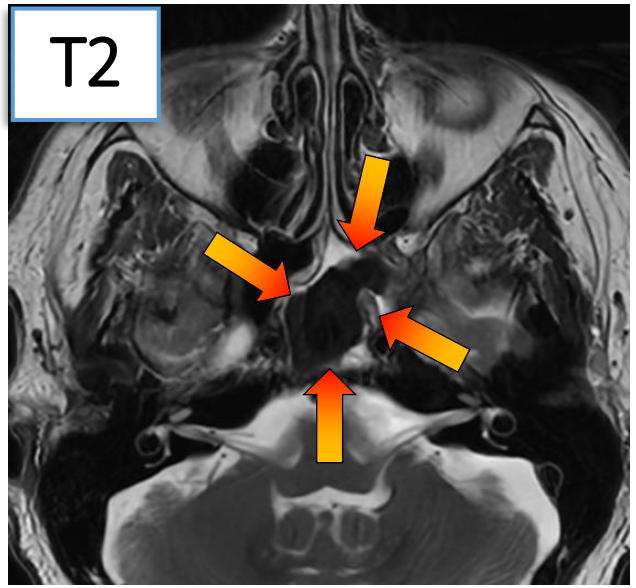
Patient 1

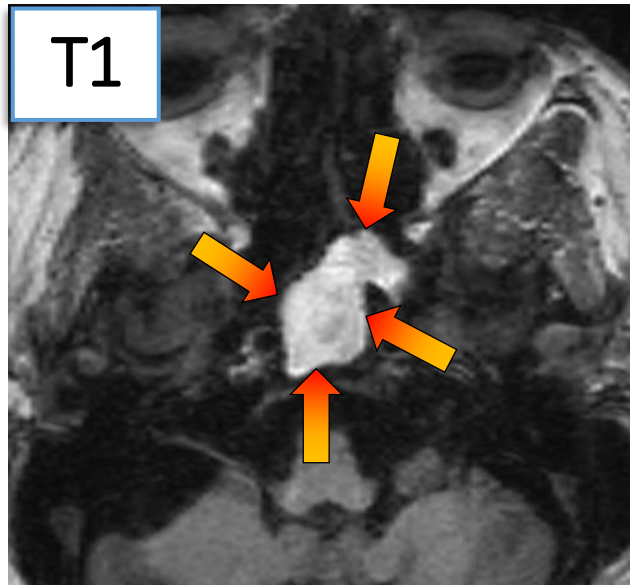
Incidental finding

Asymptomatic

Chronic secretions

Pseudoaeration





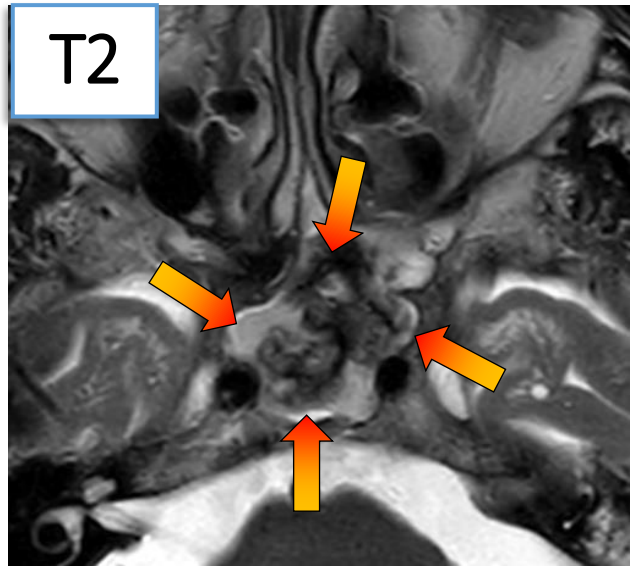
Patient 2

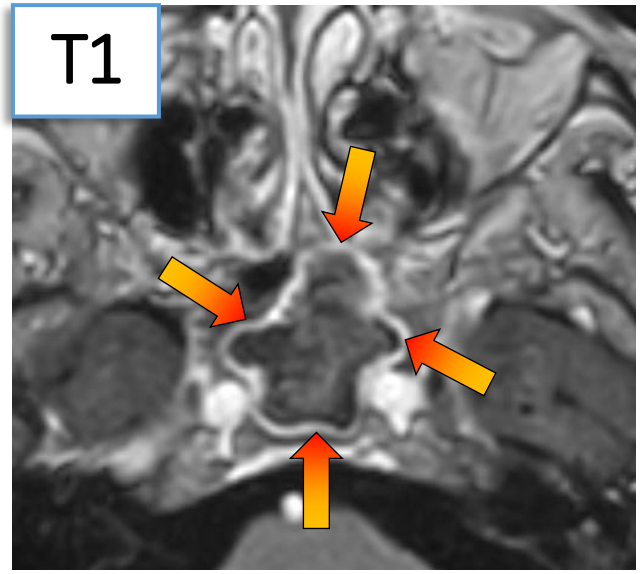
Fever

Multiple cranial nerve deficits

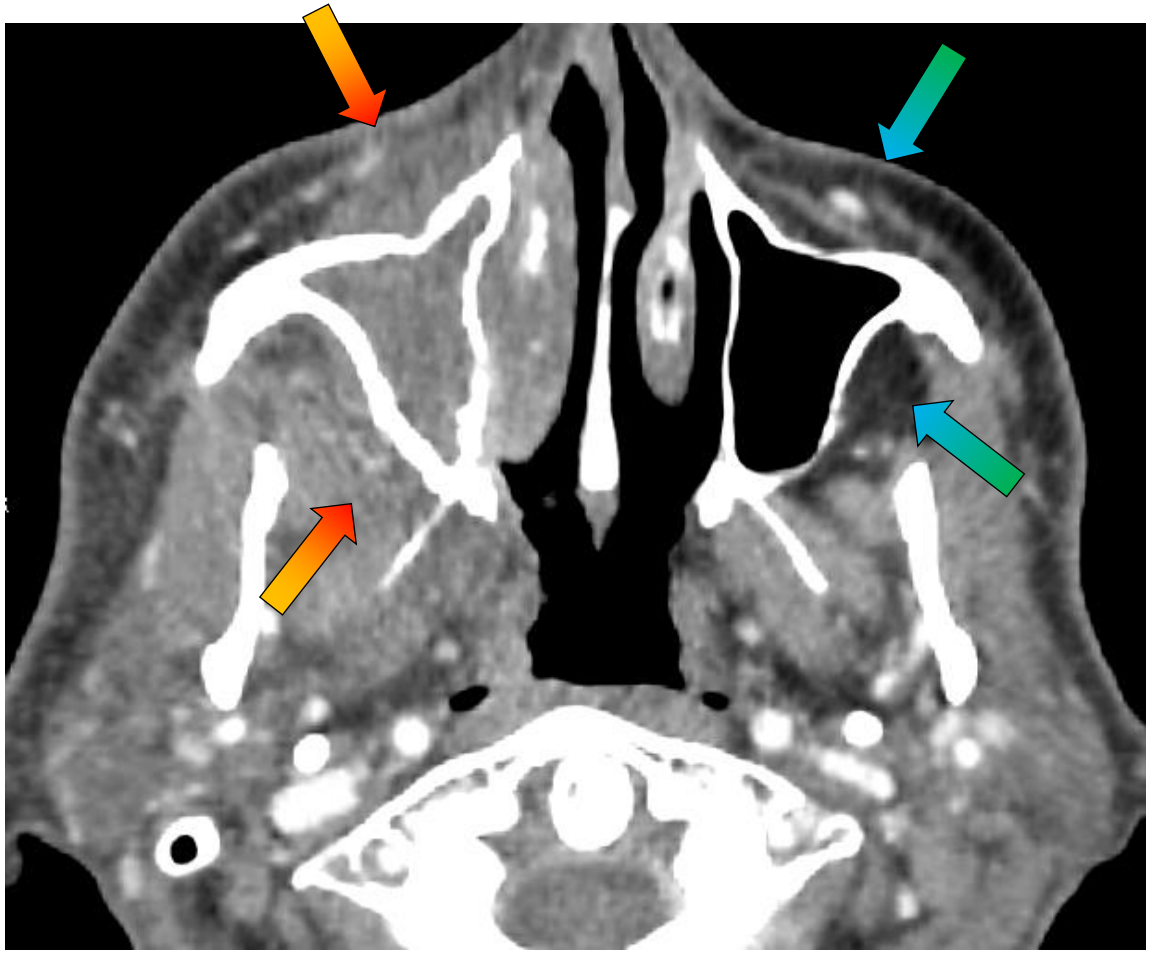
Acute invasive fungal sinusitis

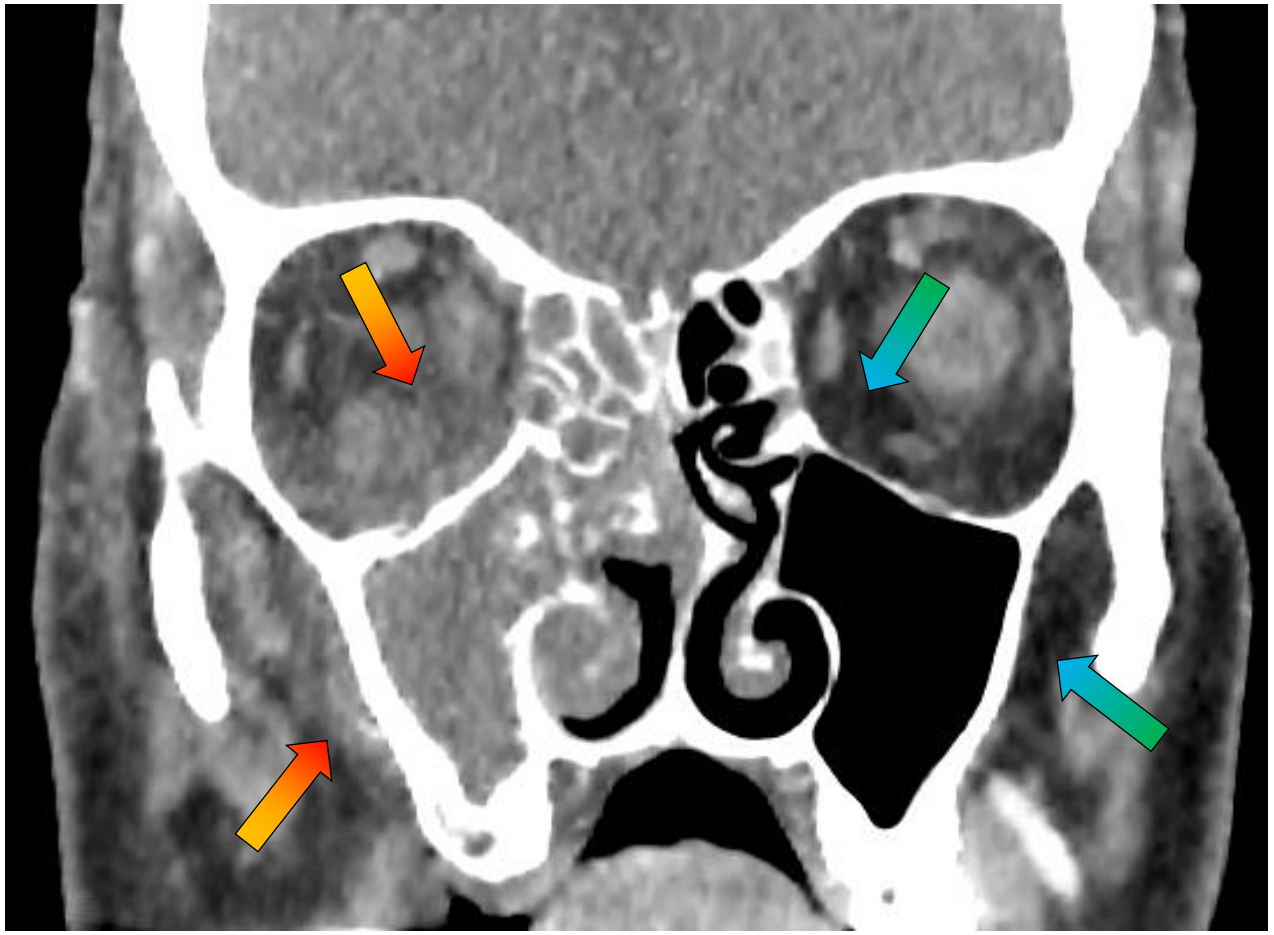
Brain invasion, fatal





Complicated sinusitis: extrasinus extension

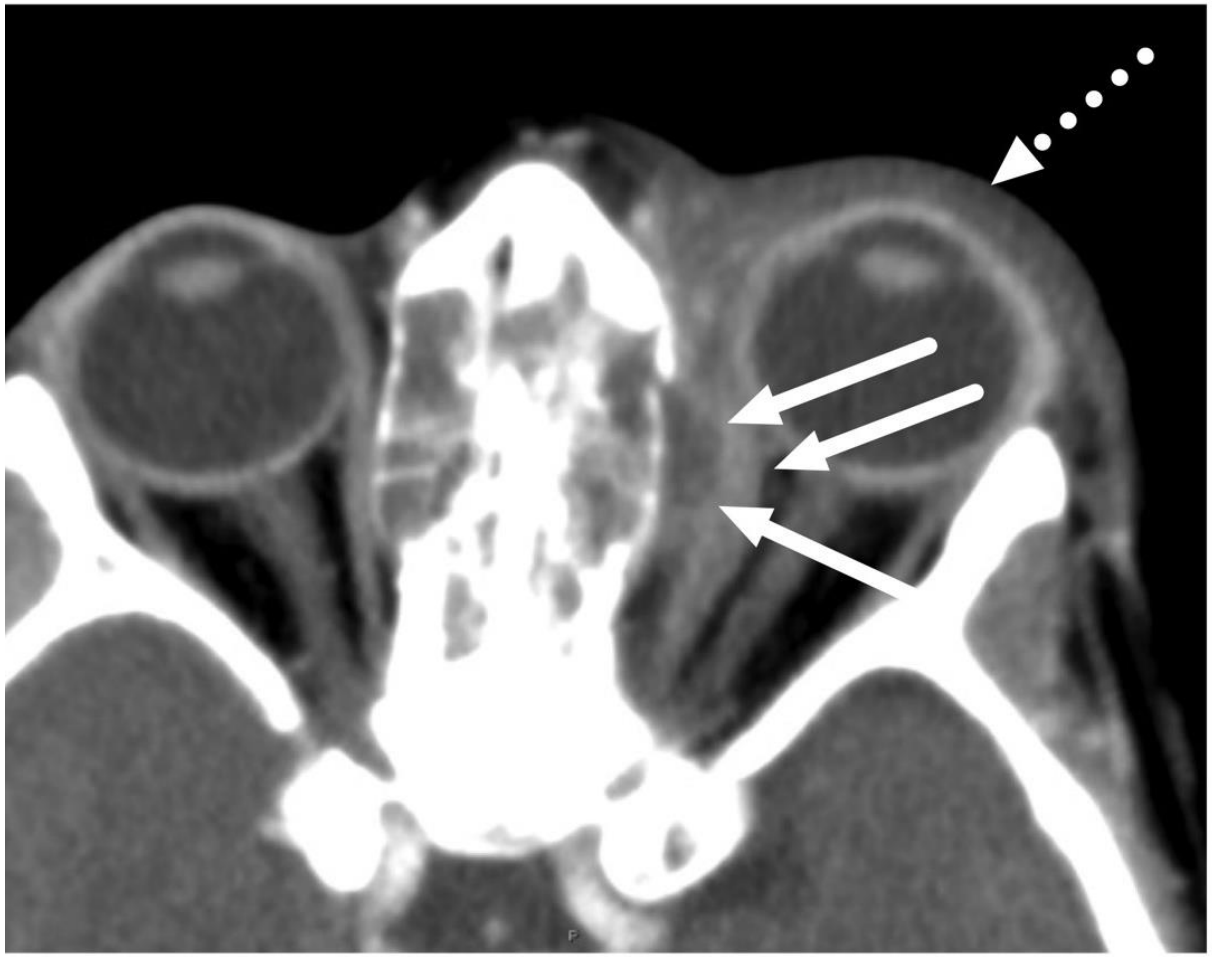




Beware: Cone-beam CT (CBCT) lacks soft tissue contrast to fully characterise extrasinus extension!

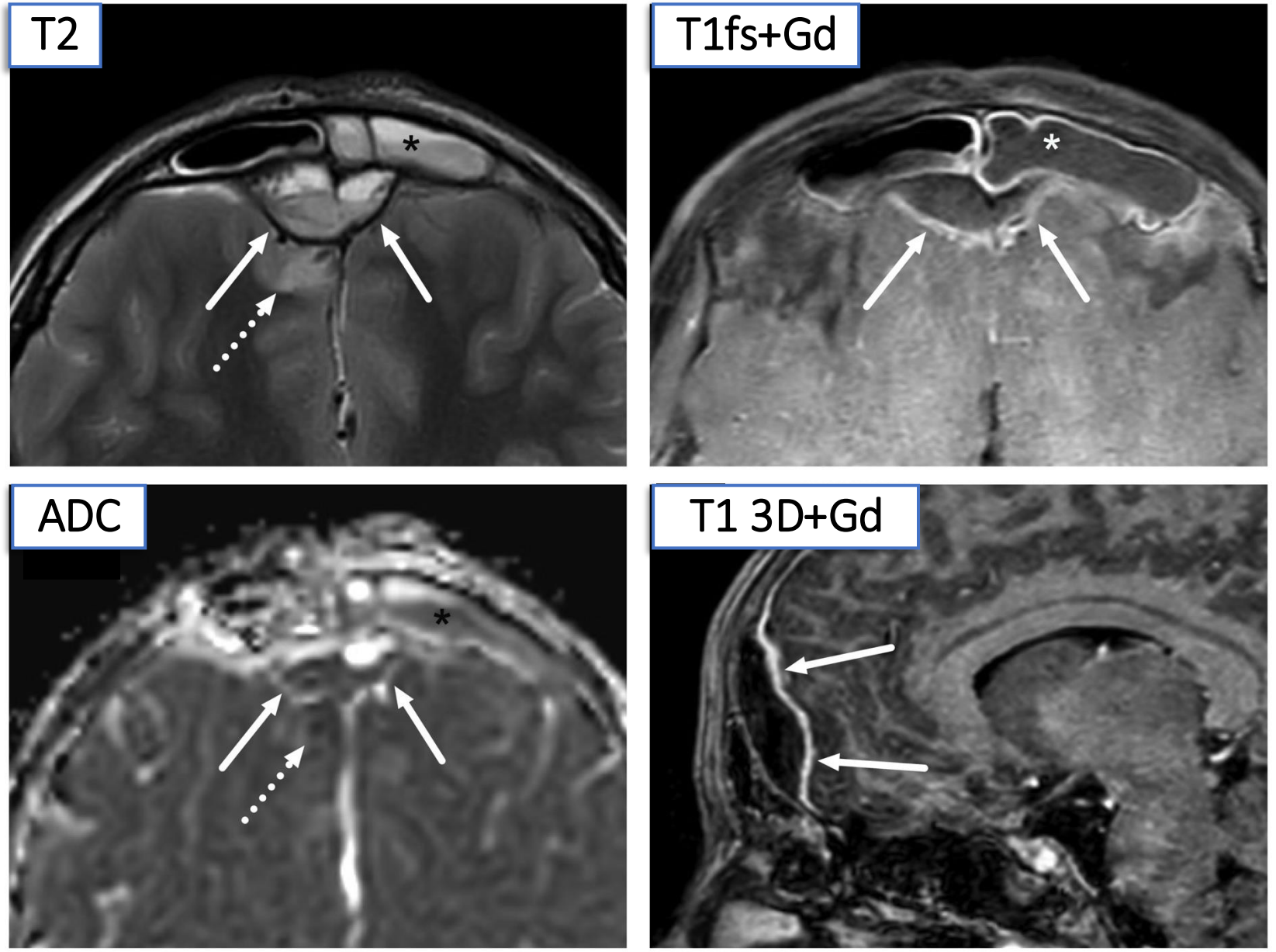
Complicated sinusitis: extrasinus extension

Orbital cellulitis and subperiosteal abscess



Complicated acute frontal sinusitis

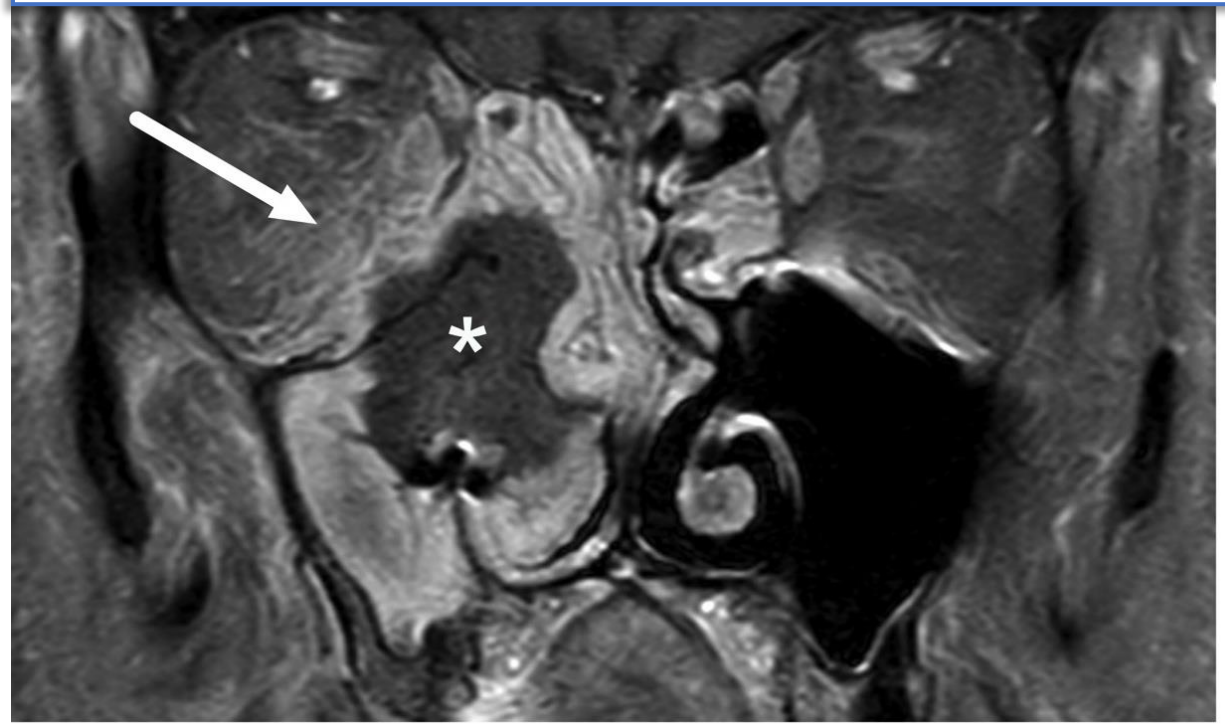
MRI highly recommended!



Epidural empyema
(intracranial epidural abscess)
Pachymeningitis
Early cerebritis

Acute invasive fungal sinusitis (AIFS)

Loss of mucosal contrast enhancement (”black turbinate sign”)

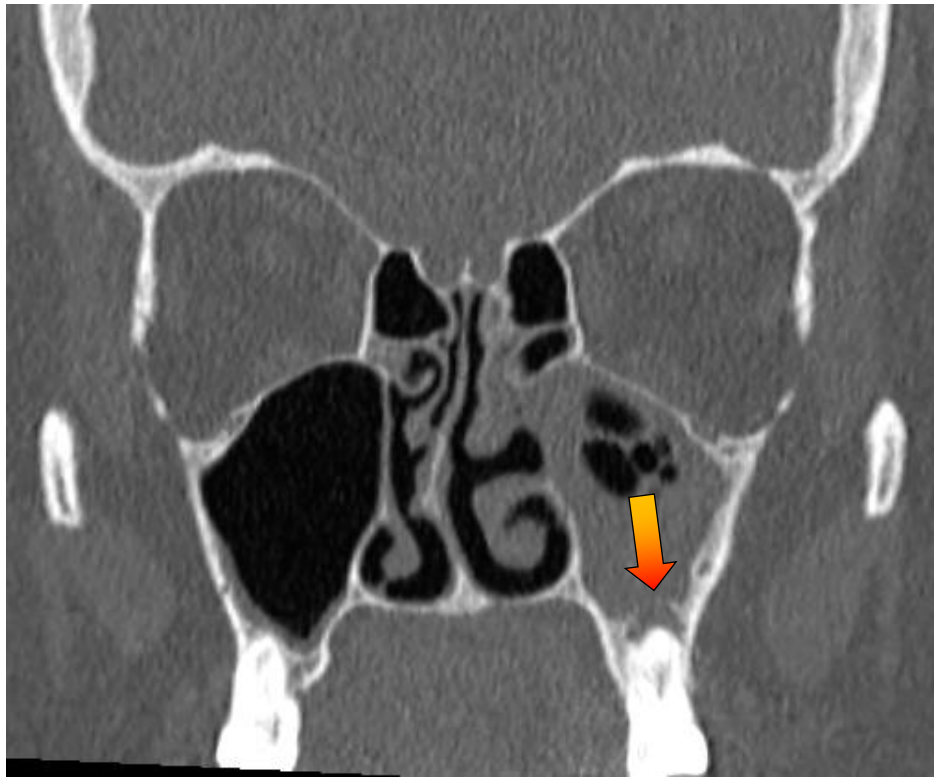


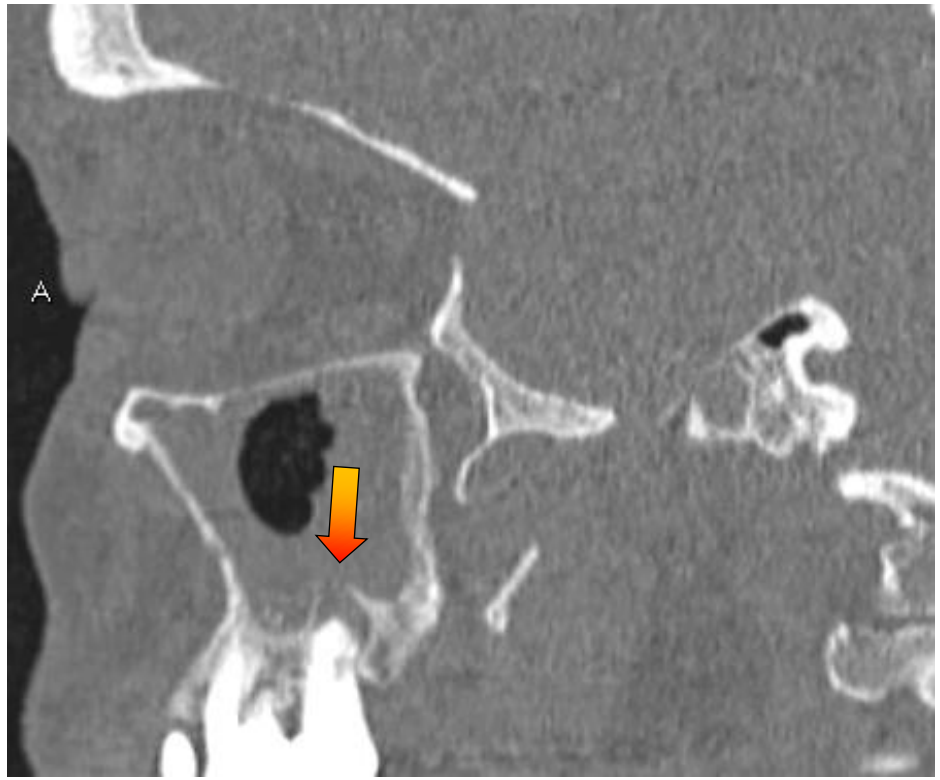
MRI highly recommended!

Mucor, *Aspergillus;* immunocompromised patients; high mortality rate (50–80%)

Consider CTA/MRA

Remember odontogenic sinusitis

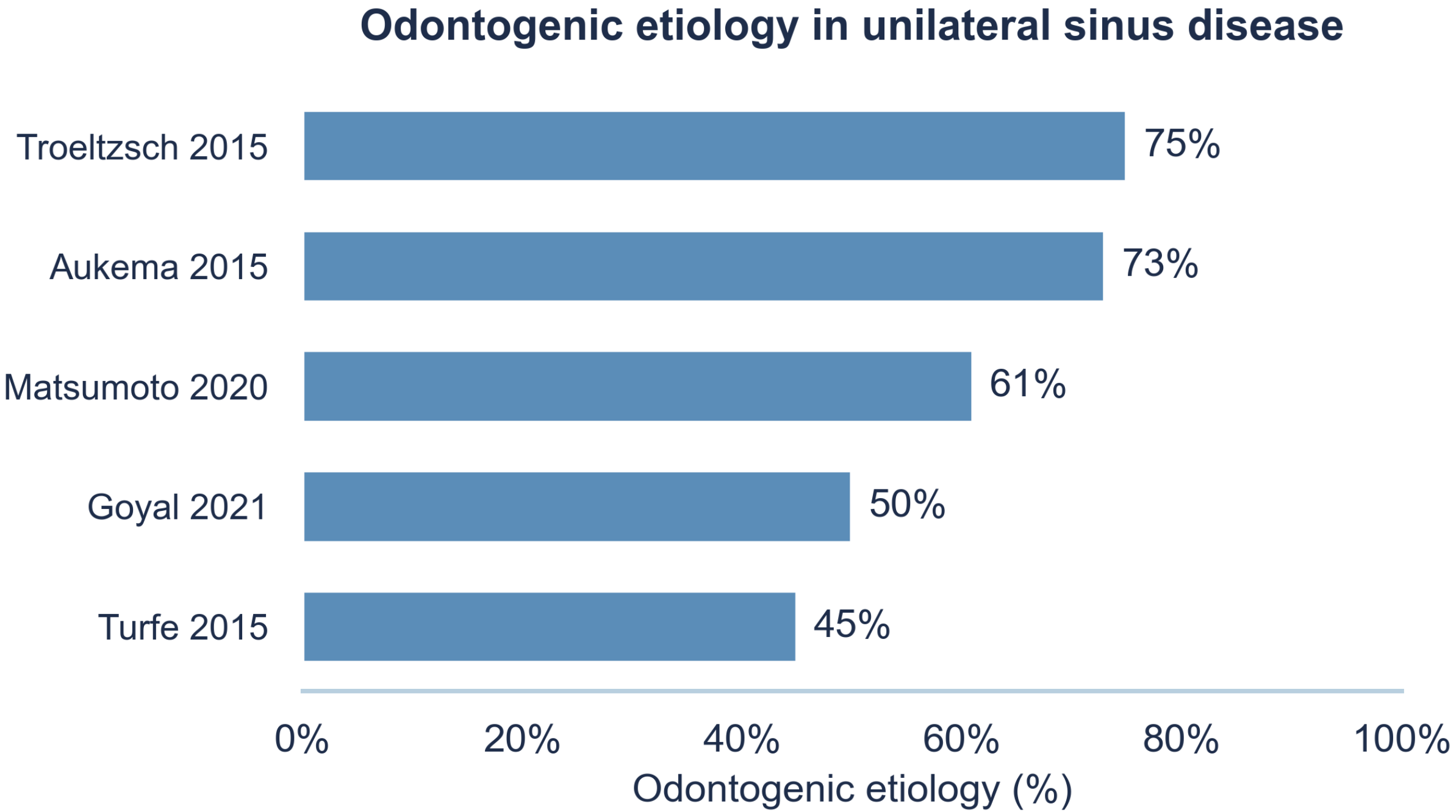




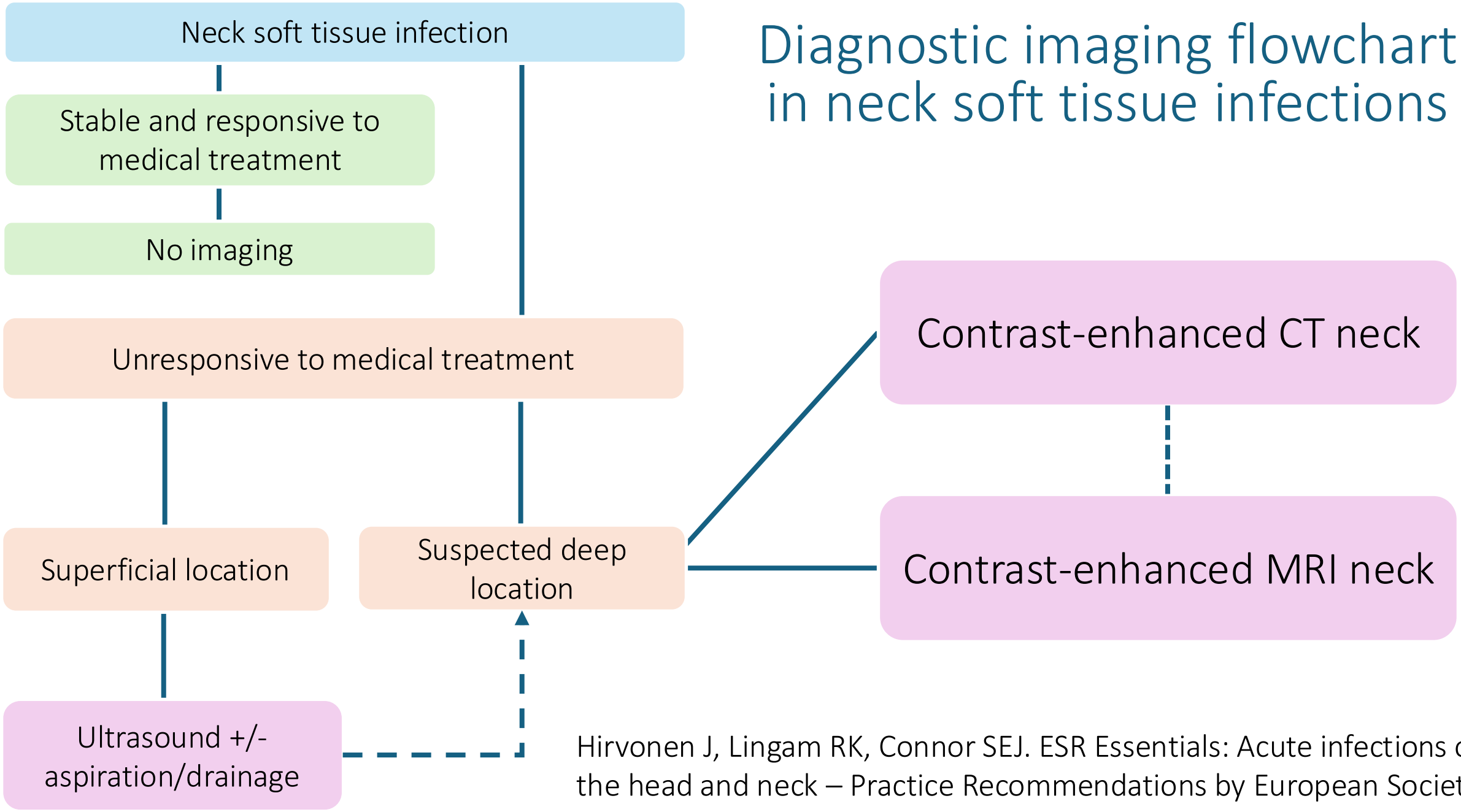
- Recurring unilateral sinusitis
- Periapical lucencies, oroantral fistulae
- Predictors[1]: foul smell, ipsilateral facial pressure, middle meatal pus on endoscopy, frontal sinus opacification

CT/CBCT better than PTG

[1]Am J Rhinol Allergy 2021;35:164-171


Odontogenic etiology in unilateral sinus disease
Troeltzsch 2015
75%
Aukema 2015
73%
Matsumoto 2020
61%
Goyal 2021
50%
Turfe 2015
45%
0%
20%
40%
60%
80%
100%
Odontogenic etiology (%)

Diagnostic imaging flowchart in neck soft tissue infections



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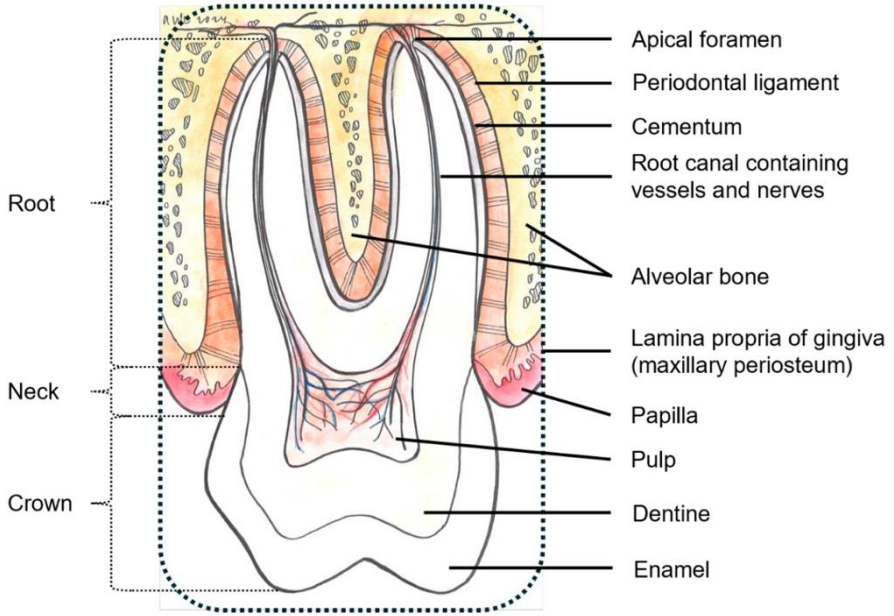
Overview of odontogenic infections (OI)

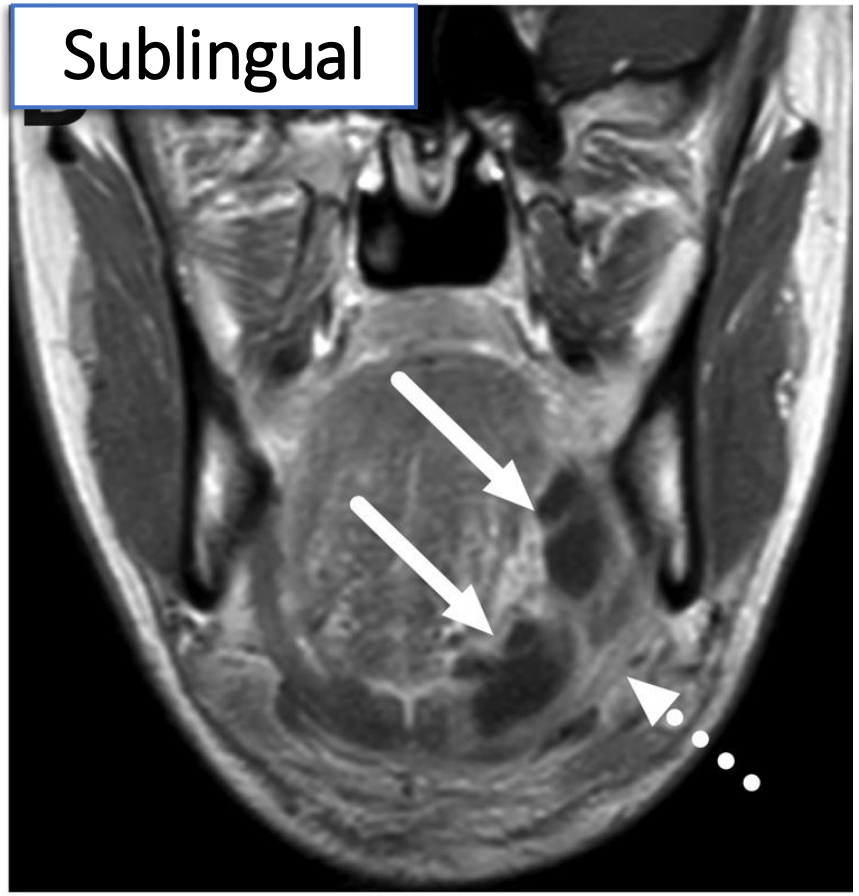
- Periapical periodontitis and postoperative infections are the most common causes
- Mandibular molars are the most common teeth
- Polymicrobial etiology involving both aerobic and anaerobic microbes
  - Str. anginosus group most severe
- Deeply extending OI suggested by toothache, fever, breathing or swallowing difficulties, trismus, facial and neck swelling
- Imaging required to demonstrate drainable abscesses and rule out complications

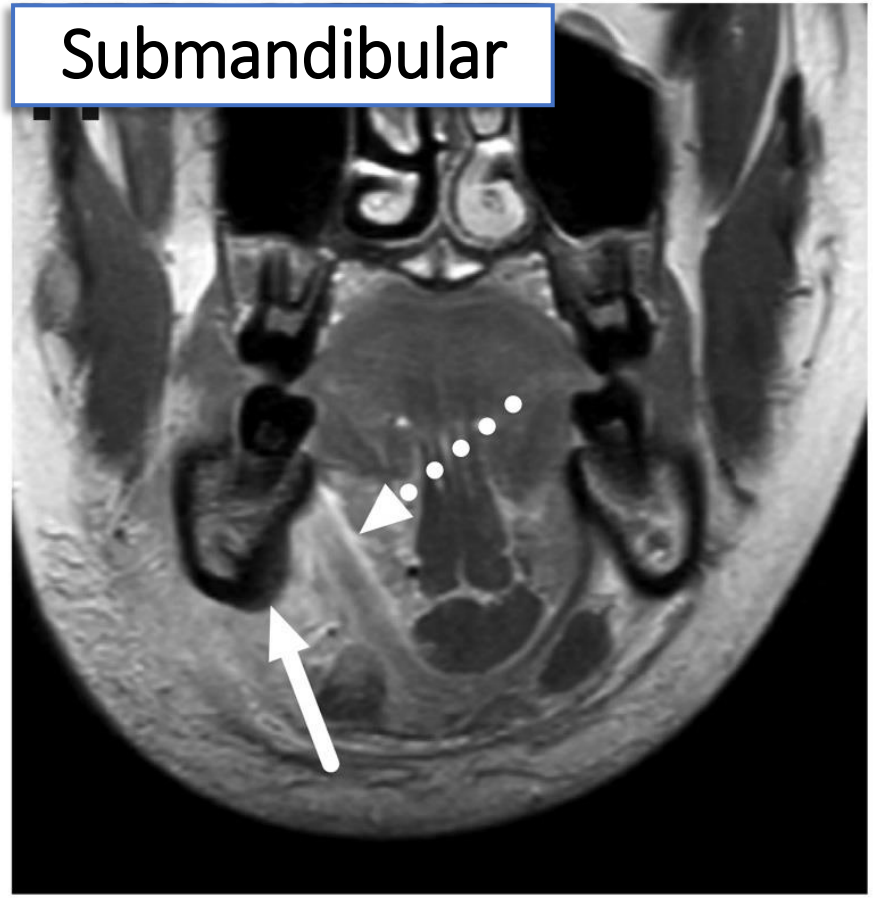


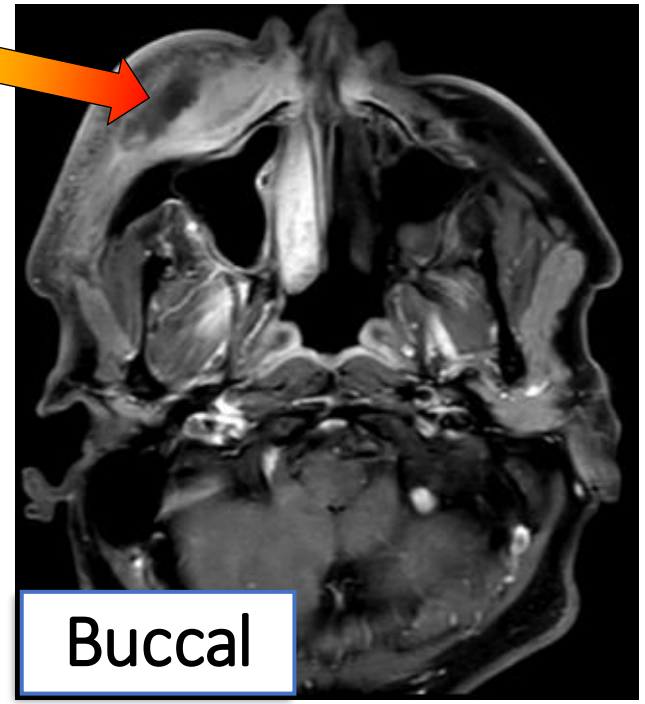
Dr. Annina Wuokko-Landén

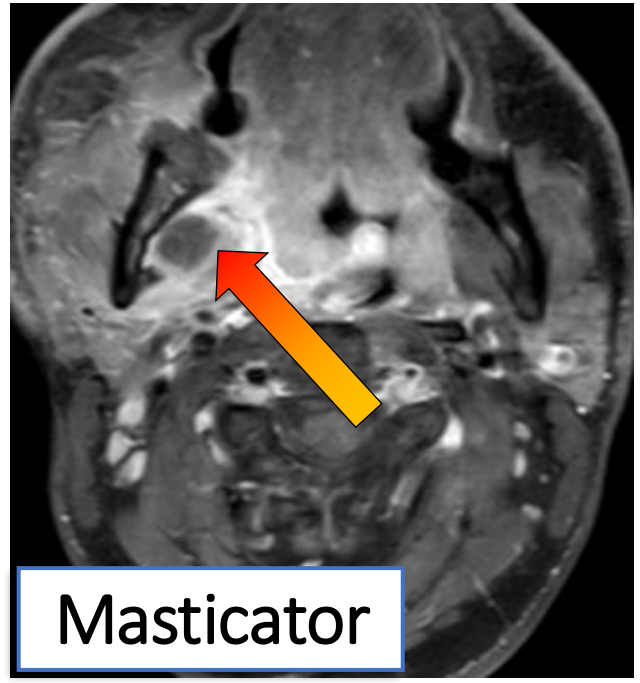
Oral cavity: mostly odontogenic abscesses

- Tooth decay
- Periapical changes
- Bone marrow changes
- **Abscesses**









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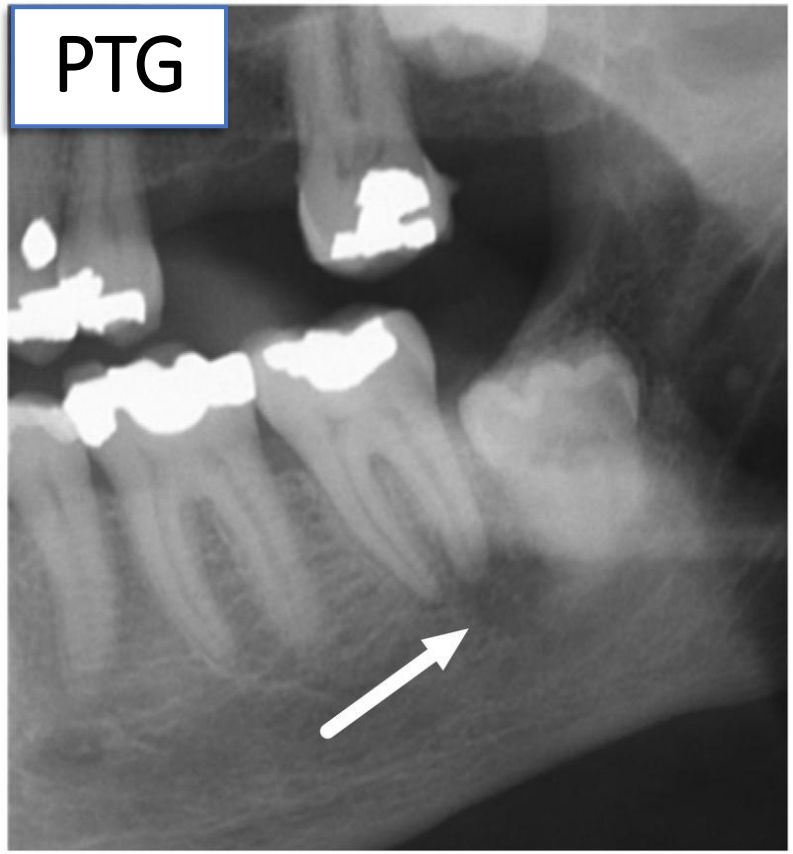
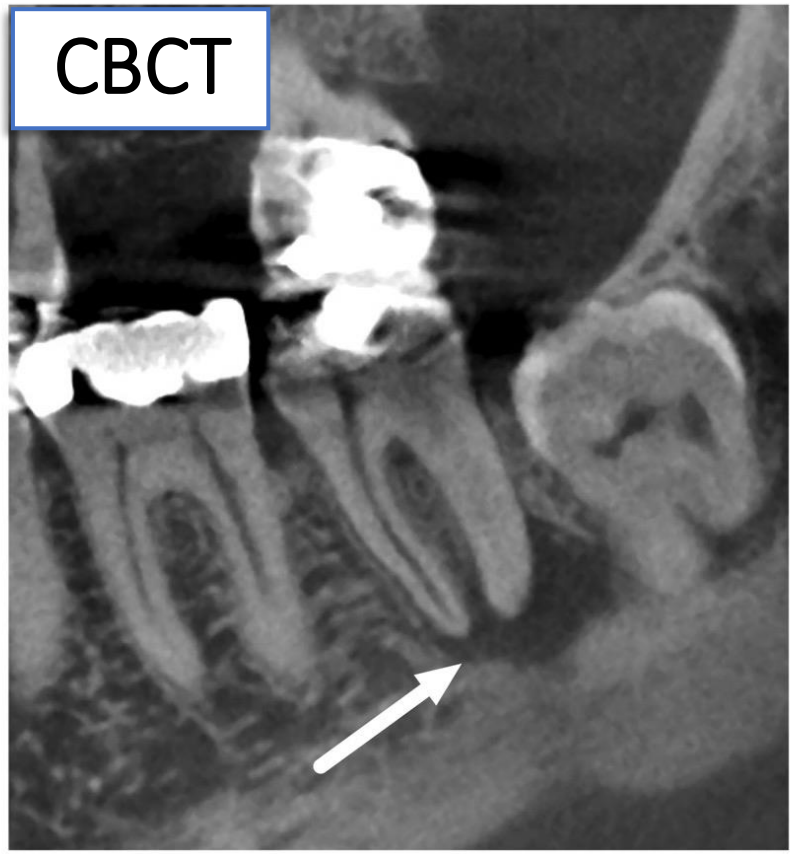
Odontogenic neck infections

- Tooth decay
- **Periapical infection**
- Bone marrow edema
- Abscesses





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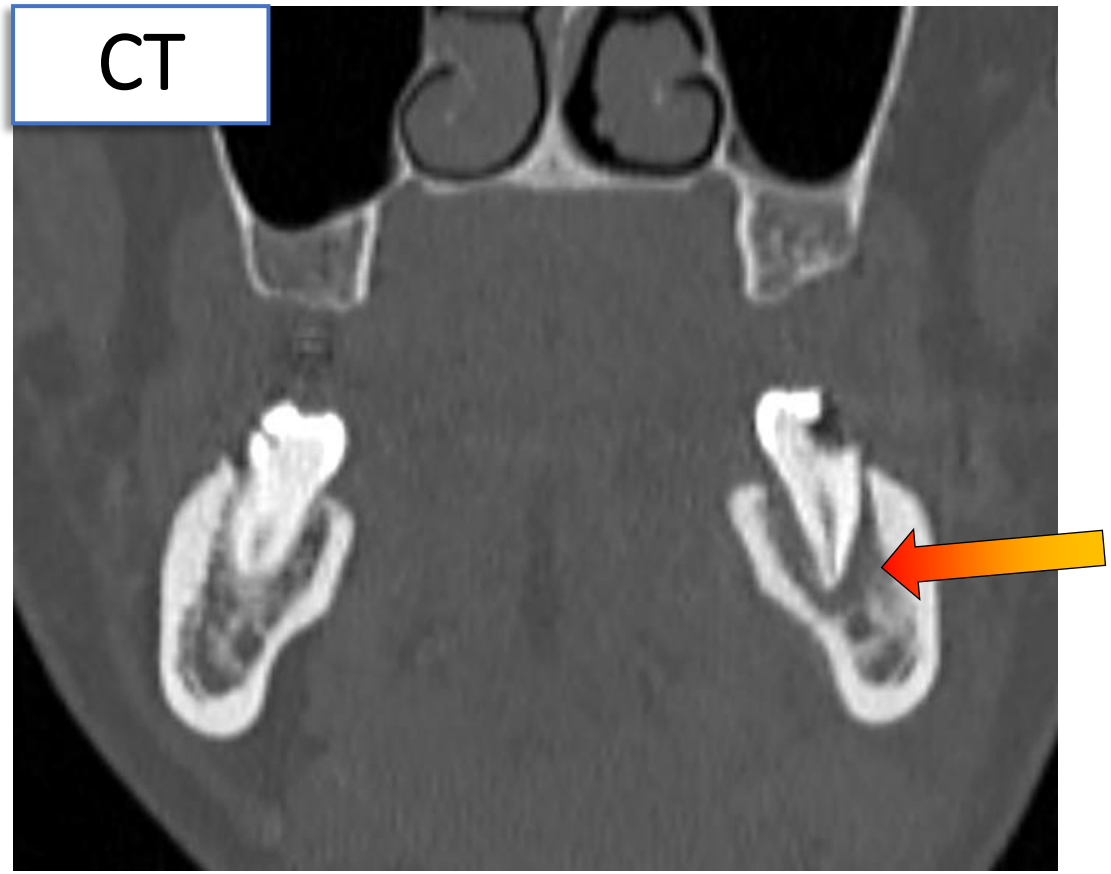
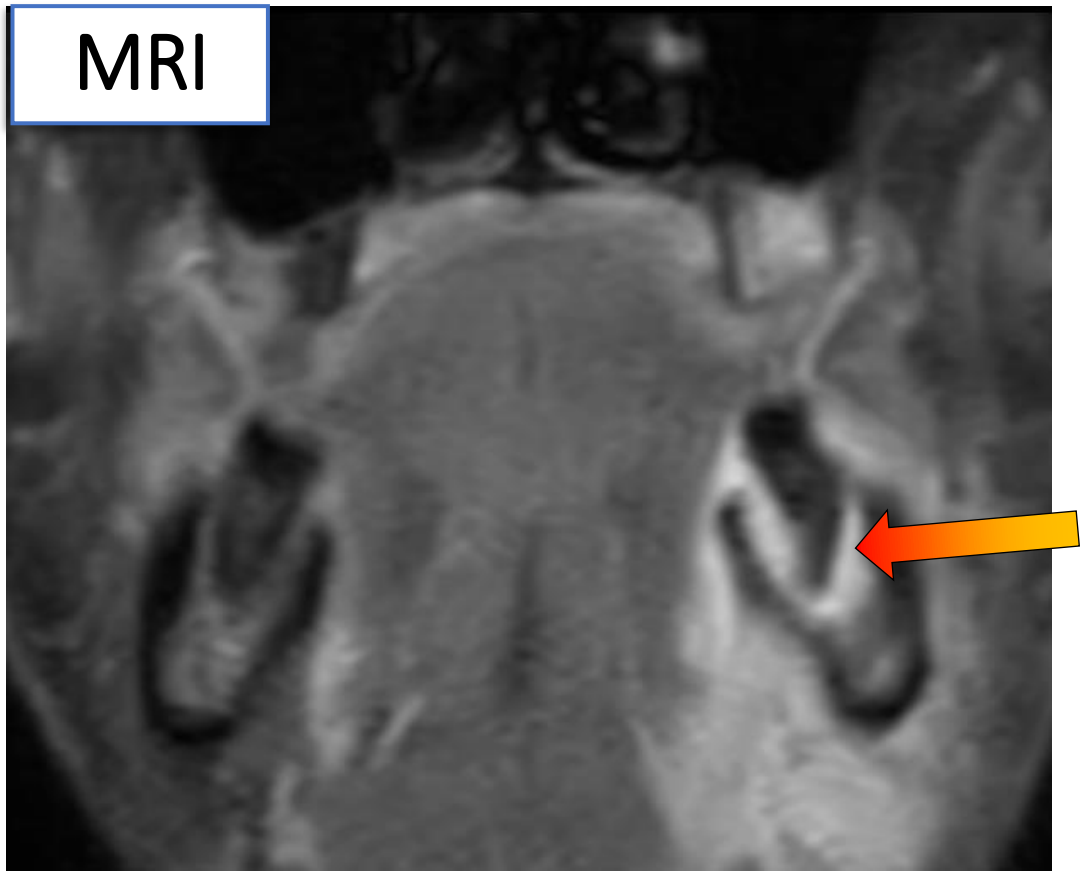
Odontogenic neck infections

- Tooth decay
- **Periapical infection**
- Bone marrow edema
- Abscesses





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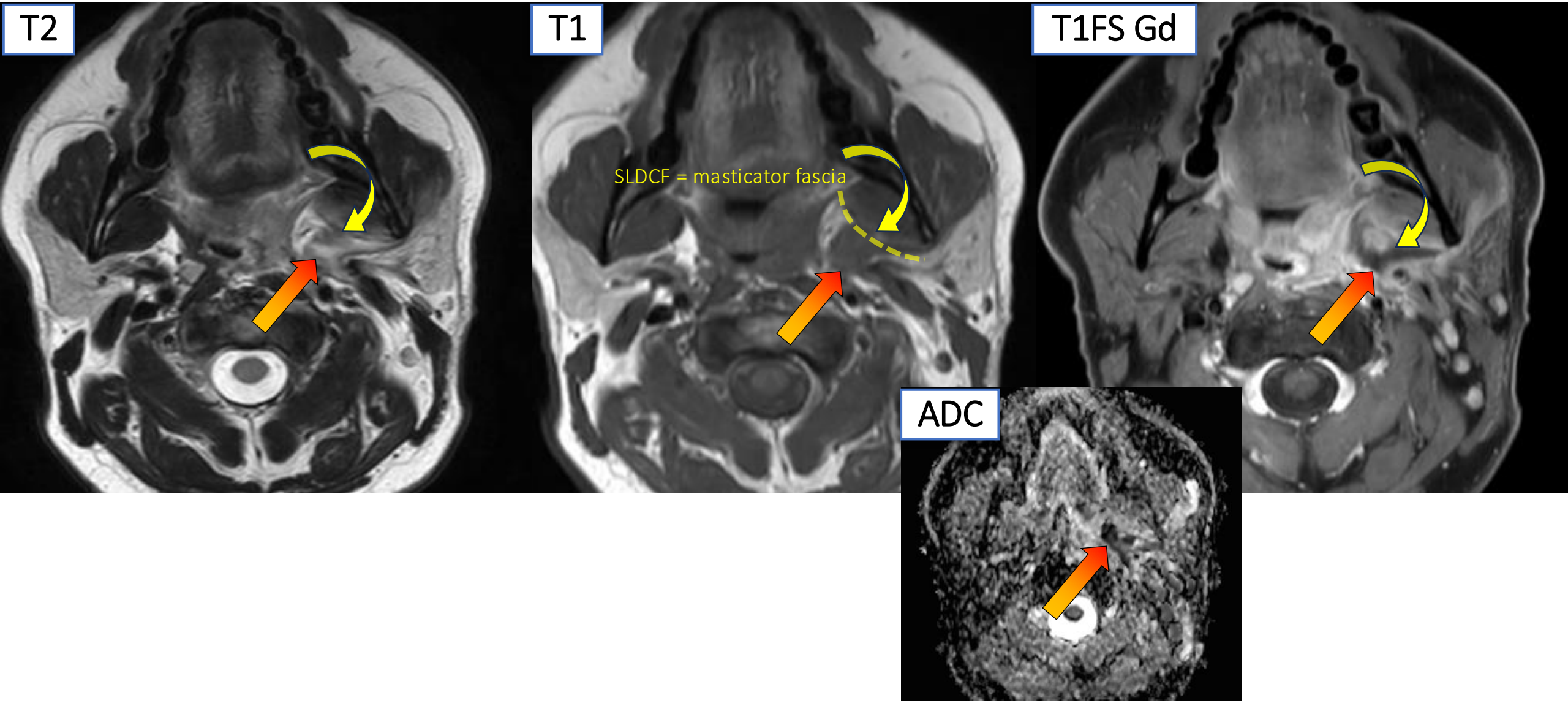
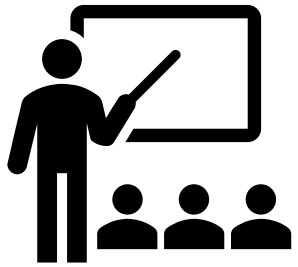
Atypical spread: Masticator space to parapharyngeal space



Checklist

- **Look around the sinuses**
  - Dirty fat anterior or posterior to the maxillary sinuses
  - Orbital and intracranial invasion
  - ”Black turbinate sign” (AIFS) – lack of mucosal enhancement
- **Look at the teeth**
  - Odontogenic sinusitis
  - Odontogenic deep neck infection
- **Look for neck soft tissue complications**
  - Abscess formation
  - Airway compromise
  - Vascular thrombosis

Learning objectives



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Save the date!

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38th Annual Meeting and Refresher Course

September 10–12 | Budapest, Hungary