Case Presentation: Petrous Apicitis

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Presentation- Day 1-2

- A 8-year-old boy with no past medical history presented to Urgent Care with **right sided ear pain**. He was diagnosed with otitis externa and prescribed otic drops.
- At home he was able to play without difficulty with Tylenol and Motrin.
- He was noticed to be **walking with his neck tilted to the right**.
- Later that evening, he developed a **severe headache localized to the right temporal area**. He was unable to sleep due to pain.

Presentation- Day 3

- The next morning he presented at the Emergency Center due to persistent pain.

Physical Exam

The right tympanic membrane was described as "non-impressive."

Labs

None ordered at this time

Imaging

None ordered at this time

A/P

- Diagnosis of inner ear infection was made.
- An intramuscular injection of an antibiotic was given, but mom was unsure as to its name. Amoxicillin was discontinued and azithromycin was started. He continued to receive Motrin and Tylenol.
- Discharged same day.

Presentation- Day 4

- The next morning, the patient was brought back to the Emergency Center due to persistent symptoms and worsening headache.

Labs

- Hemoglobin 11.4
- Hematocrit 33.3
- MCV 78
- White Blood Cell Count 10.9
  - Neutrophils 7.3
  - Lymphocytes 2.4
  - Monocytes 1.0
  - Eosinophils 0.1
  - Basophils 0.1
- Platelet Count 301,000.

Imaging

A CT scan of the head was obtained due to concern of mastoiditis but was normal.

A/P

- Diagnosis still inner ear infection.
- Azithromycin was continued, as well as Motrin and Tylenol.
- He was prescribed Ciprodex HC otic drops.

Presentation- Day 7

- A week later the patient had continued right sided pain and was taken to his primary care physician.

Physical Exam

The right eardrum was described as red in color but there was no other signs of infection.

Labs

None ordered at this time

Imaging

None ordered at this time

A/P

- Diagnosis of still inner ear infection.
- Ciprodex was discontinued, and azithromycin was continued.

Presentation- Day 8

- The next morning he began seeing “double” and was brought in for a third ER visit.

Labs

None ordered at this time

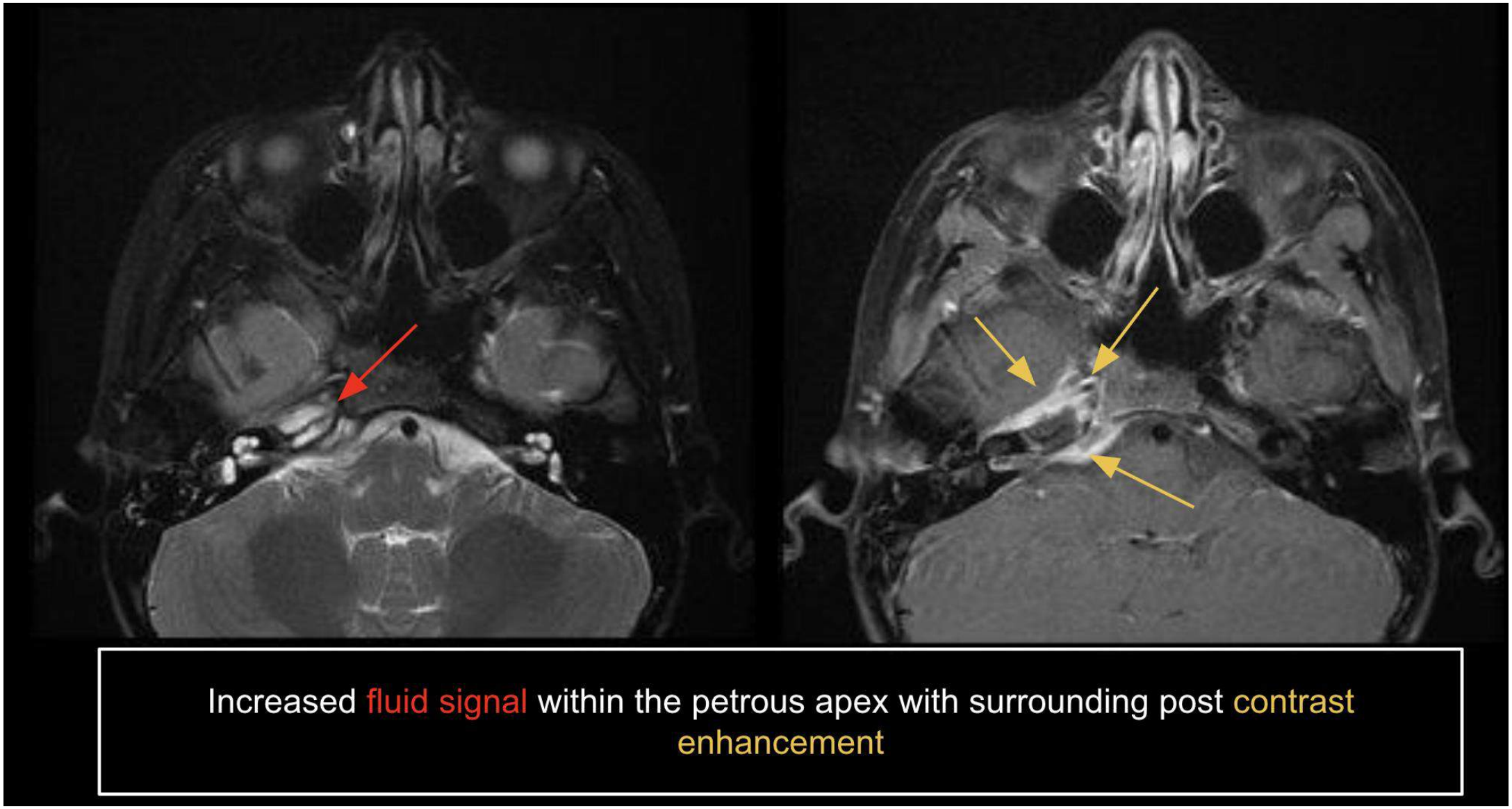
Imaging

- MRI demonstrated enhancement of the right petrous apex with extension into the right cavernous sinus consistent with petrous apicitis and of a 60% stenosis of the right distal petrous artery consistent with vasculitis.
- MRV was negative for venous sinus thrombosis or cavernous sinus thrombosis.

A/P

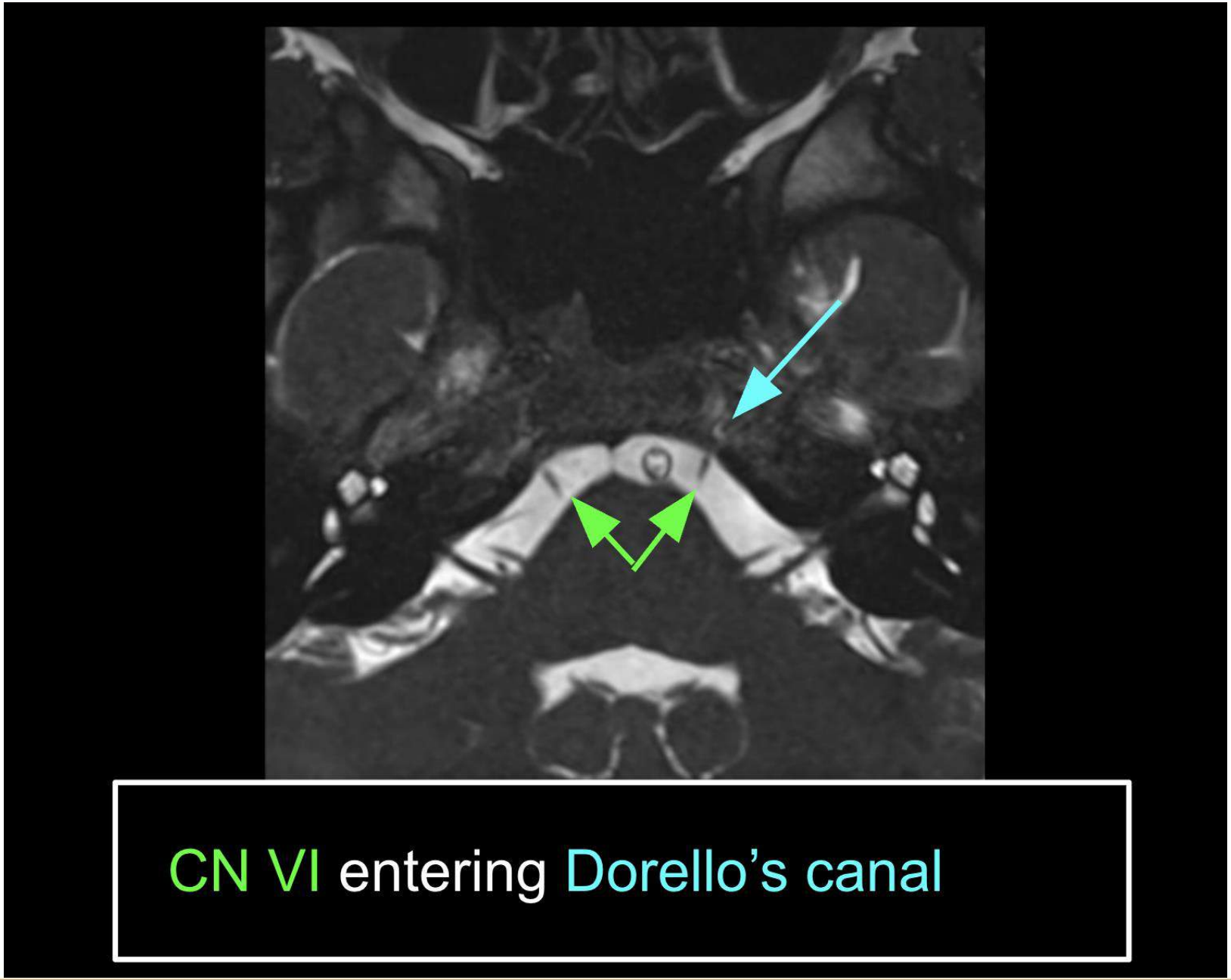
- Given the patient's findings on MRI, sixth nerve palsy can be attributed to cavernous sinus inflammation.
- His symptoms of otitis media, petrous apicitis, and sixth nerve palsy with ipsilateral facial pain is consistent with Gradenigo’s syndrome.

MRI



Increased fluid signal within the petrous apex with surrounding post contrast enhancement

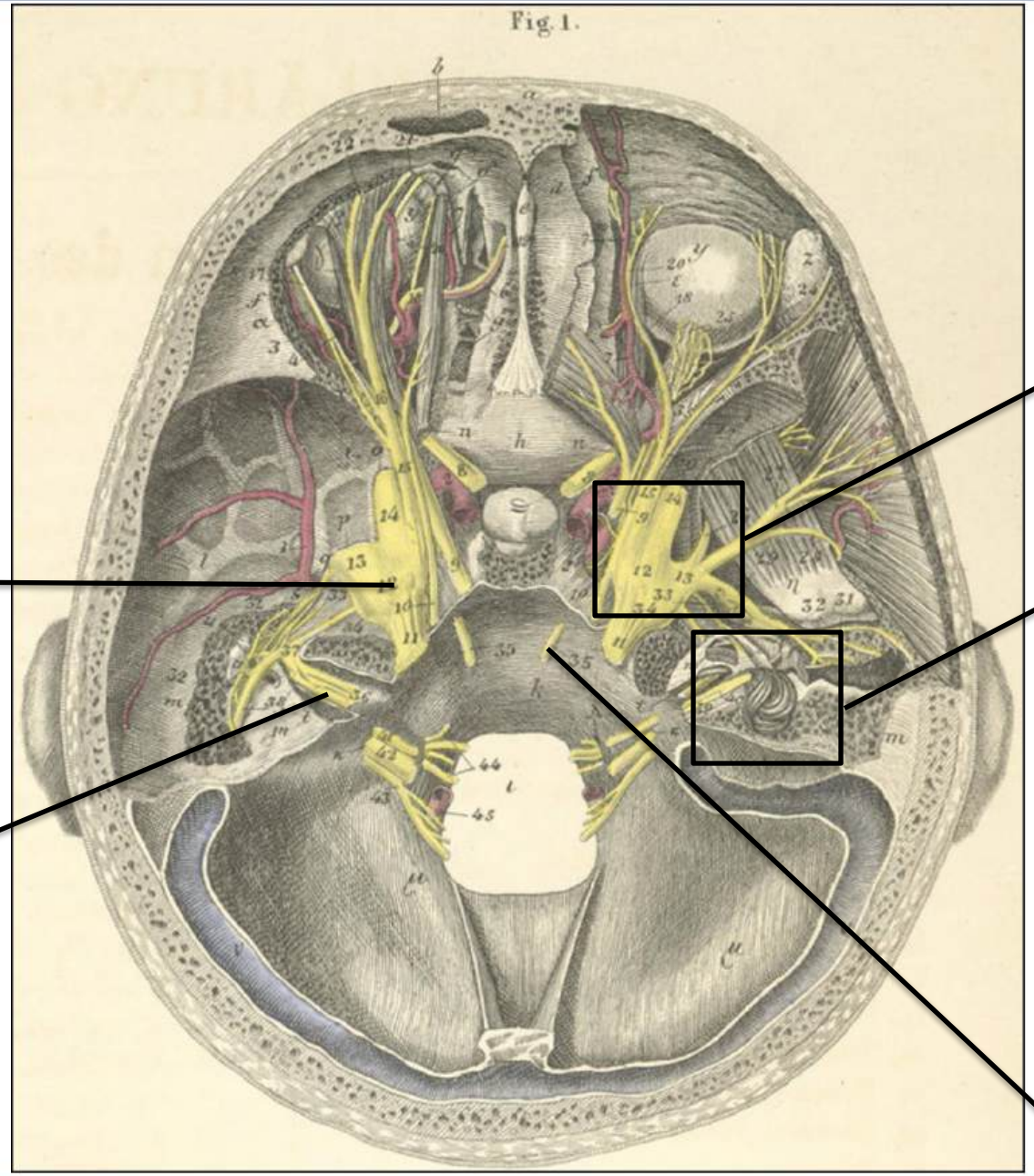
MRI



Discussion- Gradenigo Syndrome

- Inflammation or infection of the middle ear extends to petrous apex of the temporal bone
- Classic triad:
  - Otitis media
  - Facial pain due to irritation of the trigeminal nerve
  - Ipsilateral abducens palsy causing diplopia and lateral gaze limitations
- Additional symptoms:
  - hearing loss and vertigo
  - Facial muscle weakness

Discussion- Anatomy



Petrous Apex

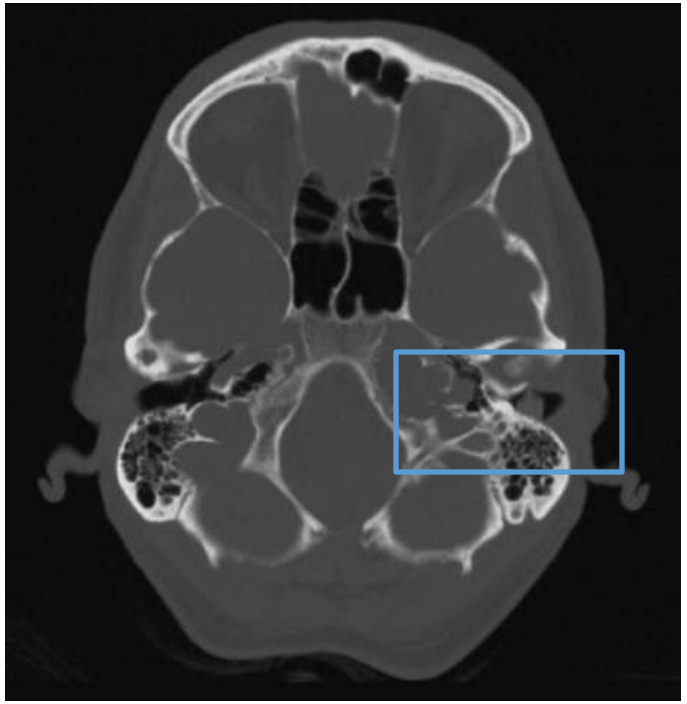
Middle Ear

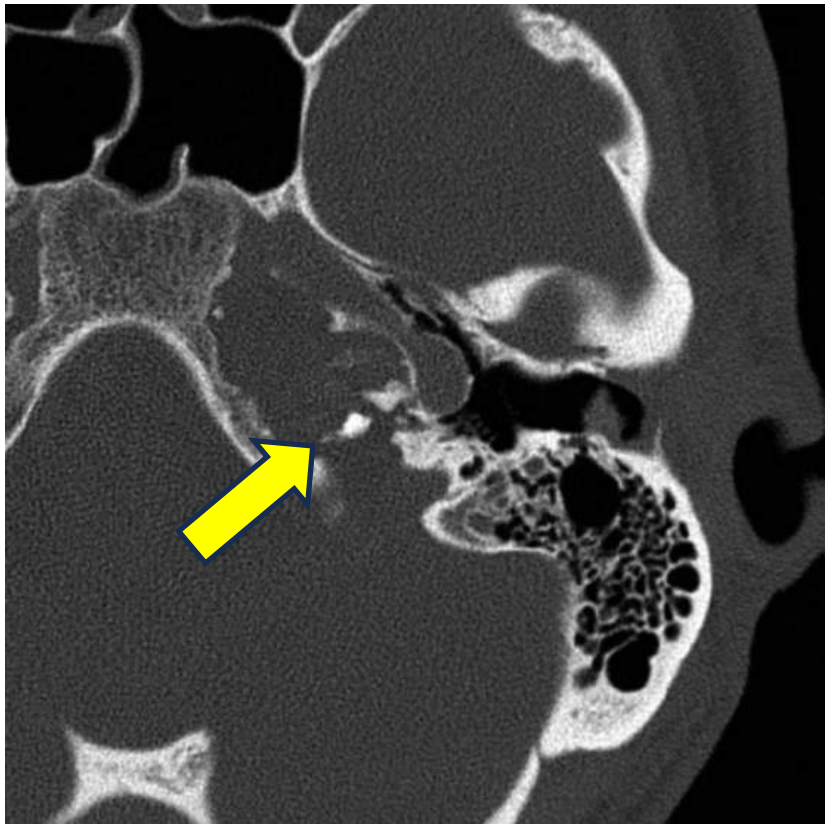
Trigeminal Nucleus

Facial and Vestibulocochlear Nerves

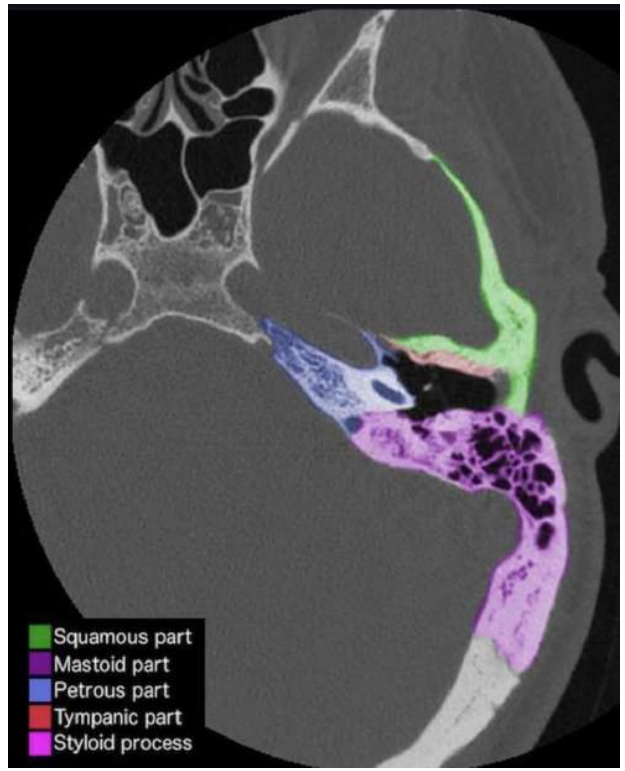
Abducens N. entering Dorello's Canal

Discussion- Features on CT



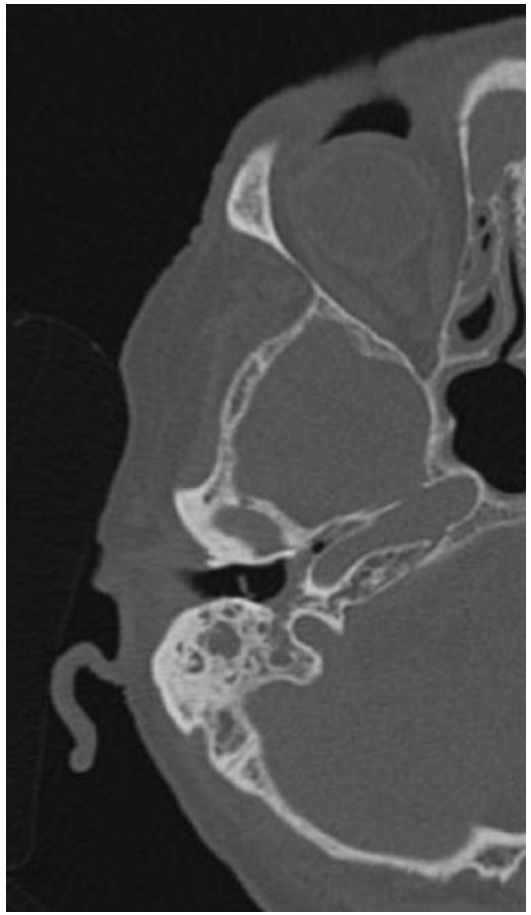


Petrous Apicitis with irregular lytic destruction

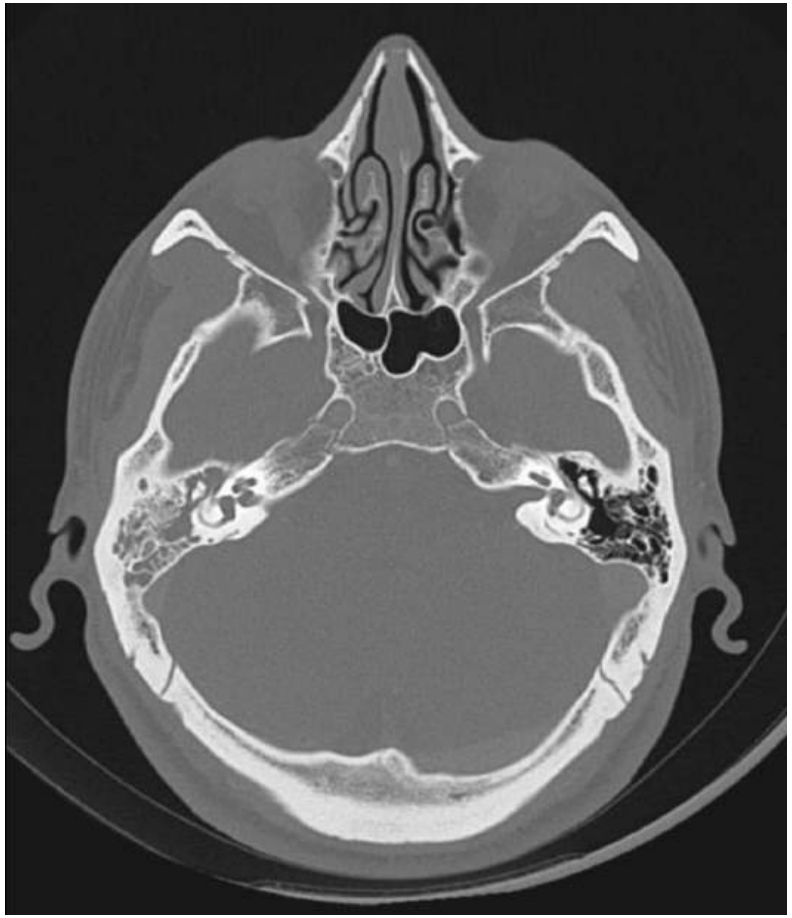


Normal CT

Discussion- Features on CT



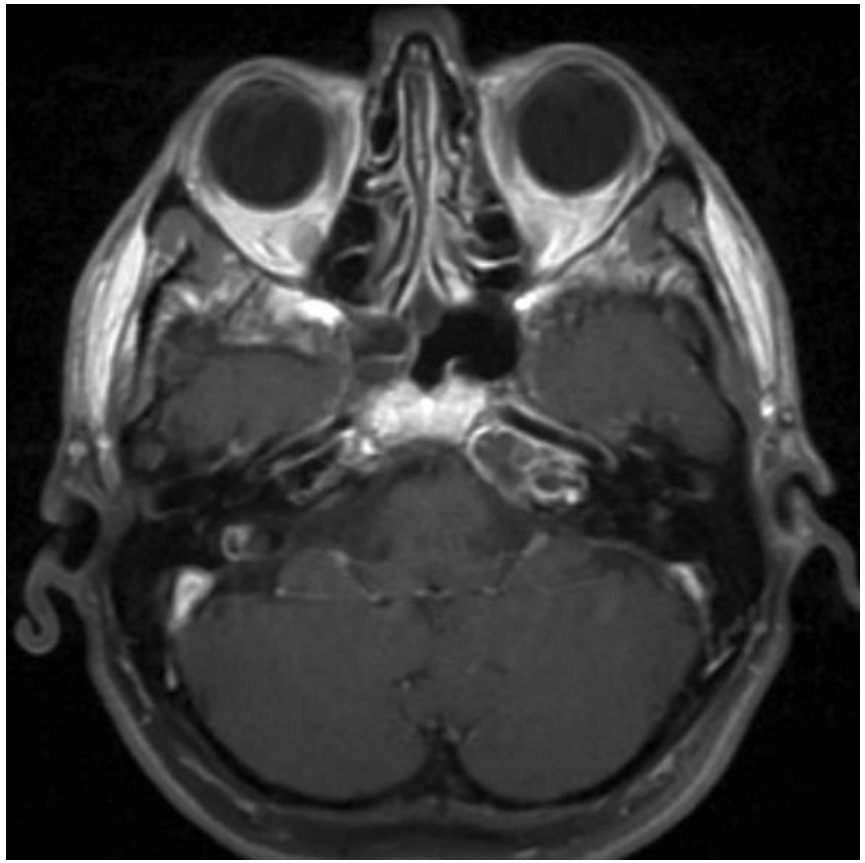
Chronic Otitis Media with obliteration of mastoid air cells



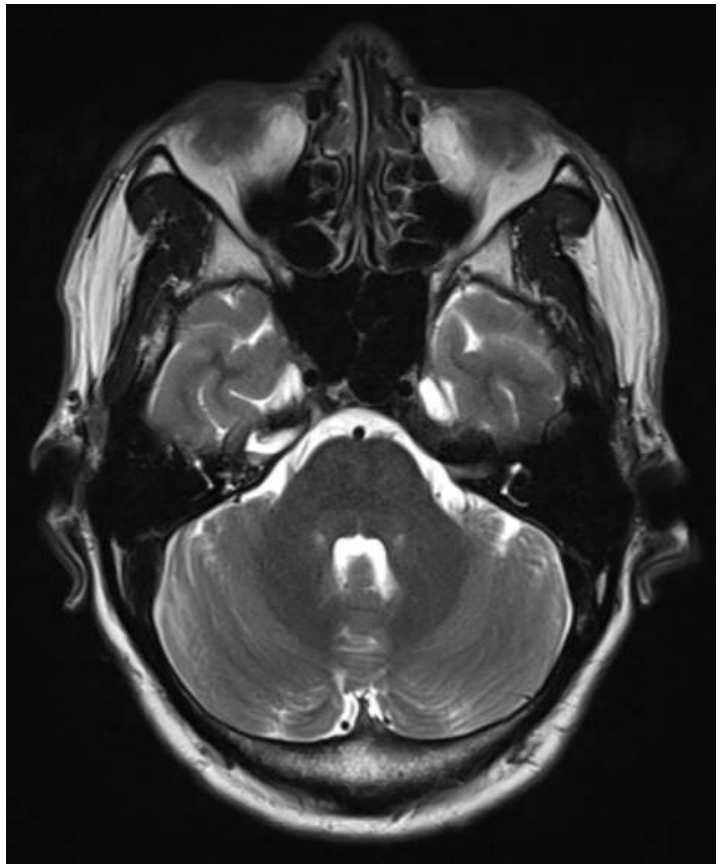
Acute Mastoiditis

Normal CT

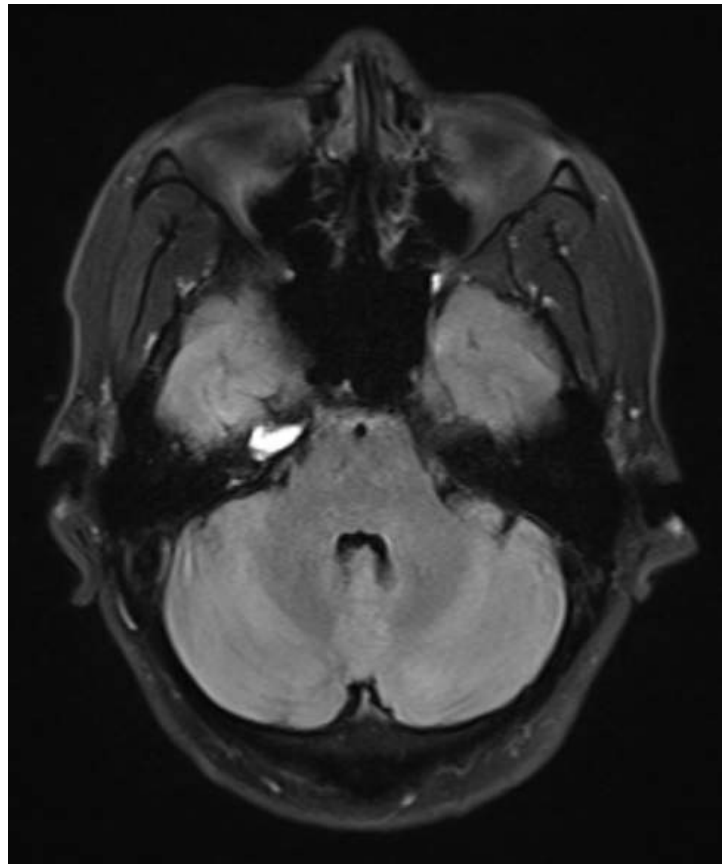
Discussion- Features on MRI



Axial T1 weighted imaging: L petrous apex with intermediate signal intensity with irregular peripheral enhancement



Axial T2 weighted imaging: lesion at right petrous apex



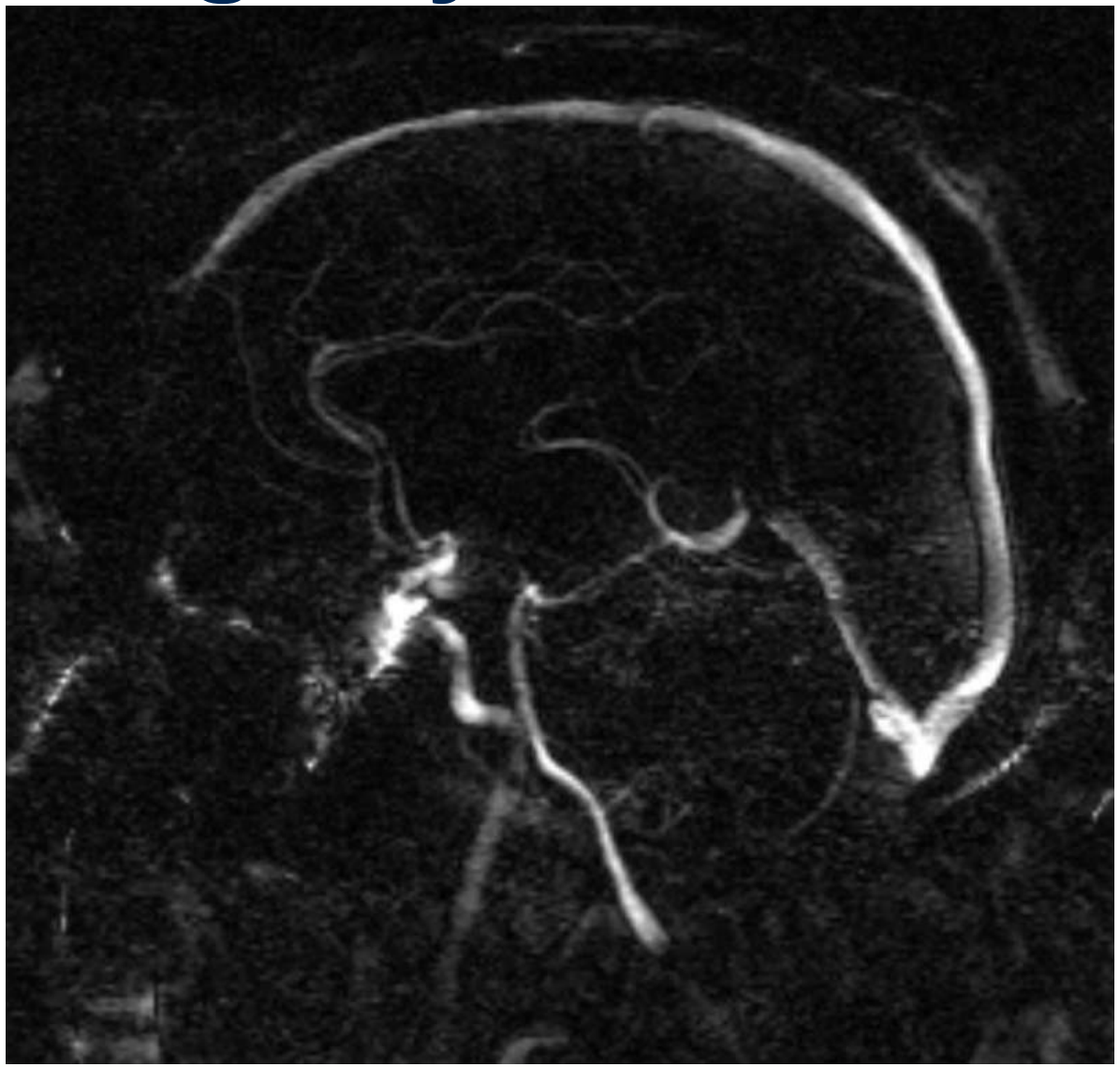
Axial FLAIR imaging: lesion at right petrous apex

Discussion- Gradenigo Syndrome Complications

- Cerebral venous sinus thrombosis
- Meningitis
- Intracranial abscess
- Carotid artery involvement

Discussion- Gradenigo Syndrome Complications

- Most common: Cerebral venous sinus thrombosis
- Best visualized on MRV



Conclusion

- Petrous apicitis is caused by the extension of otitis media into the mastoid and temporal apex.
- Gardengio Syndrome often presents with a classic triad of otitis media, facial pain, and ipsilateral abducens palsy.
- CT/ MRI are used for diagnosis.
- Cerebral venous sinus thrombosis, meningitis, intracranial abscess, and carotid artery involvement are possible complications.
- Treatment with antibiotics.

References

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