Pulsatile Tinnitus: From Diagnosis to Treatment

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THIS IS MODERN MEDICINE

Case History

52 year old female

5 year history of right sided PT

- Debilitating
- Severely affecting QoL
- Chronic sleep deprivation
- Seen several physicians, ENT, 2 x GPs, neurology, psychiatry
- **No improvement** with CBT, sound machine, tinnitus retraining

What is Pulsatile Tinnitus & Why Should GPs Care?

- **Definition**: Perception of rhythmic sound synchronous with heartbeat.

- **Differentiate** from common *non-pulsatile* tinnitus (ringing, buzzing). Non-pulsatile usually doesn't need imaging unless unilateral or specific red flags are present.

- PT **often has an identifiable cause**, unlike most non-pulsatile tinnitus.

- **Key Message:** ~50% of patients with true, bothersome PT have a treatable vascular cause we can potentially fix!

Myth: PT is Benign and once dAVF excluded, Patients need Reassurance

Recent study estimated the prevalence of moderate to severe depression in the PT population was 41.2%

Anxiety 43.1%

Significant impairment of following sub-categories

- Quality of life interference
- Emotionality
- Higher rates of unemployment

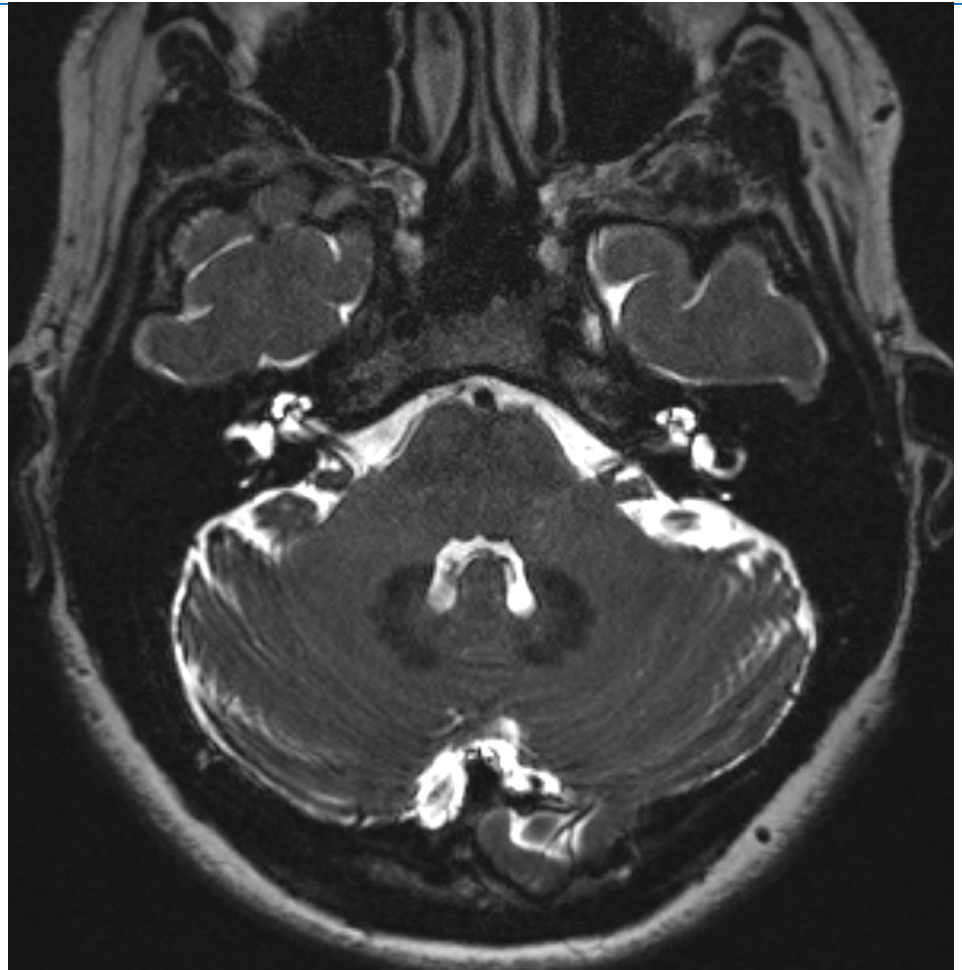
Smith, E., et al. "E-088 Psychological impact of pulsatile tinnitus in the US population." JNIS (2019): A96-A97.

Traditional Workup

MRA IAM >> Vestibular schwannoma

ENT Surgeon

CBT / Tinnitus Rehab

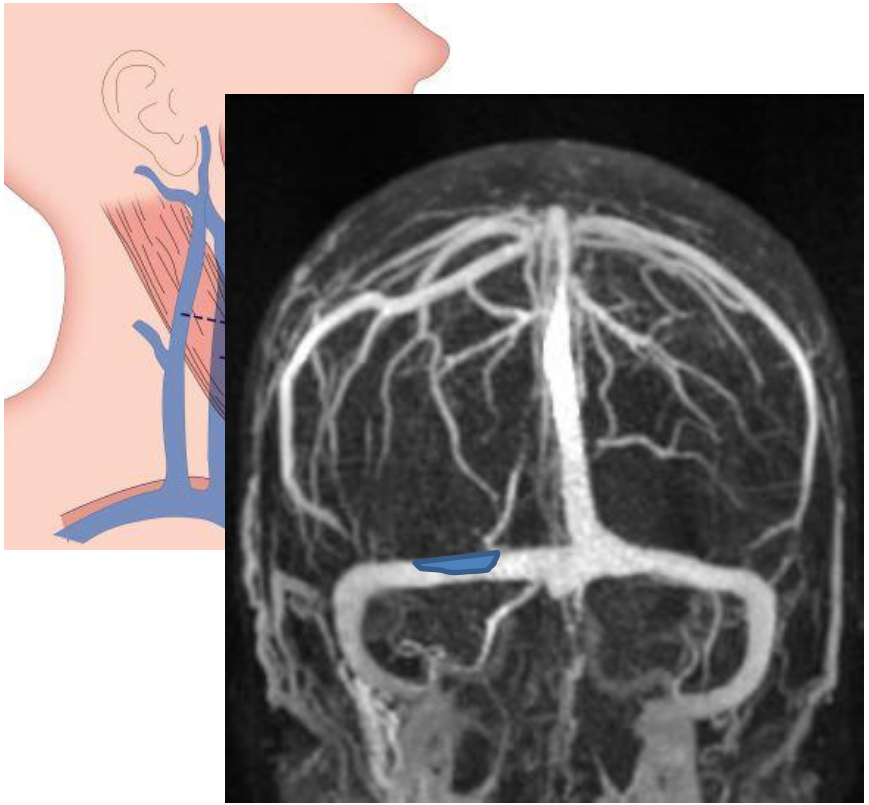


Primary Steps: History & Examination

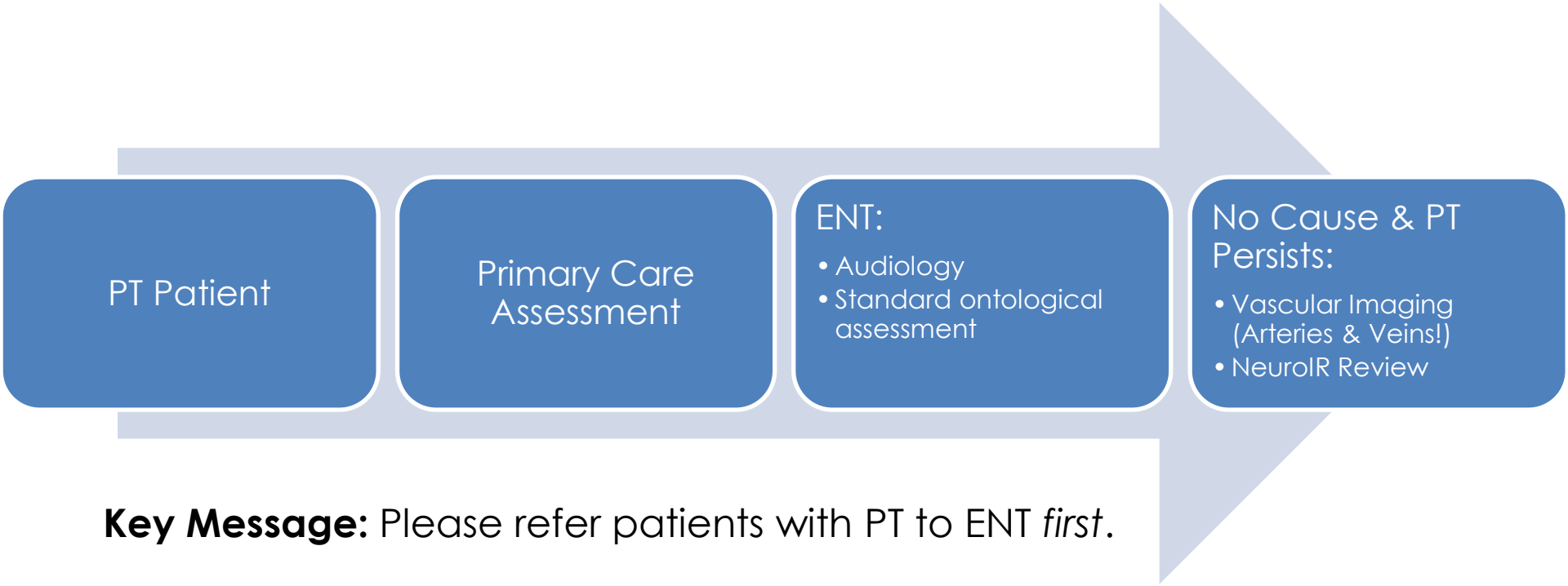
- **History:**
  - Confirm true pulse synchronicity (ask patient to tap it out).
  - Worse with exercise / menstruation?
  - Positional?
  - Is it bothersome? Affecting quality of life?
  - Associated symptoms (hearing loss, headache, visual changes)?

- **Examination:**
  - Otoscopy (check for middle ear masses).
  - Auscultation (is it objective - can *you* hear it?).

- **Key Exam: Jugular Compression Test:** Gently compress the ipsilateral internal jugular vein. Does the tinnitus stop or decrease?



Referral Pathway: ENT First!



Key Message: Please refer patients with PT to ENT *first*.

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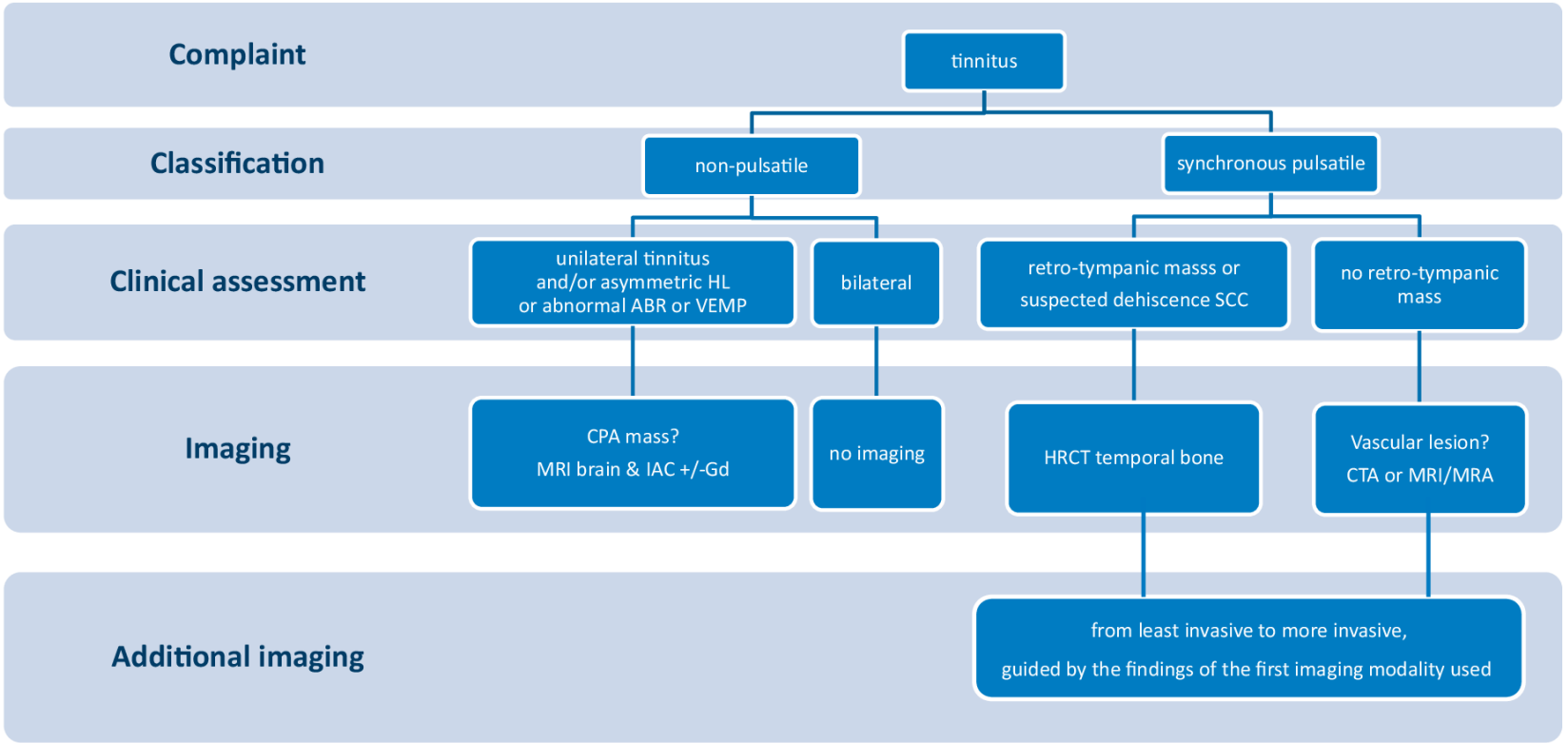
Imaging is Mandatory for True PT

If it's Pulse-Synchronous & Bothersome: Image!

Unlike non-pulsatile tinnitus, **vascular** imaging investigation is *always* required for persistent, bothersome PT.

Reason: High likelihood of finding an underlying structural cause, including potentially serious ones like fistulas or dissections, or treatable ones like venous stenosis.

Flowchart Diagnostic approach to tinnitus



HL: hearing loss, ABR: auditory brainstem respons, VEMP: vestibular evoked myogenic potential, SCC: semicircular canal

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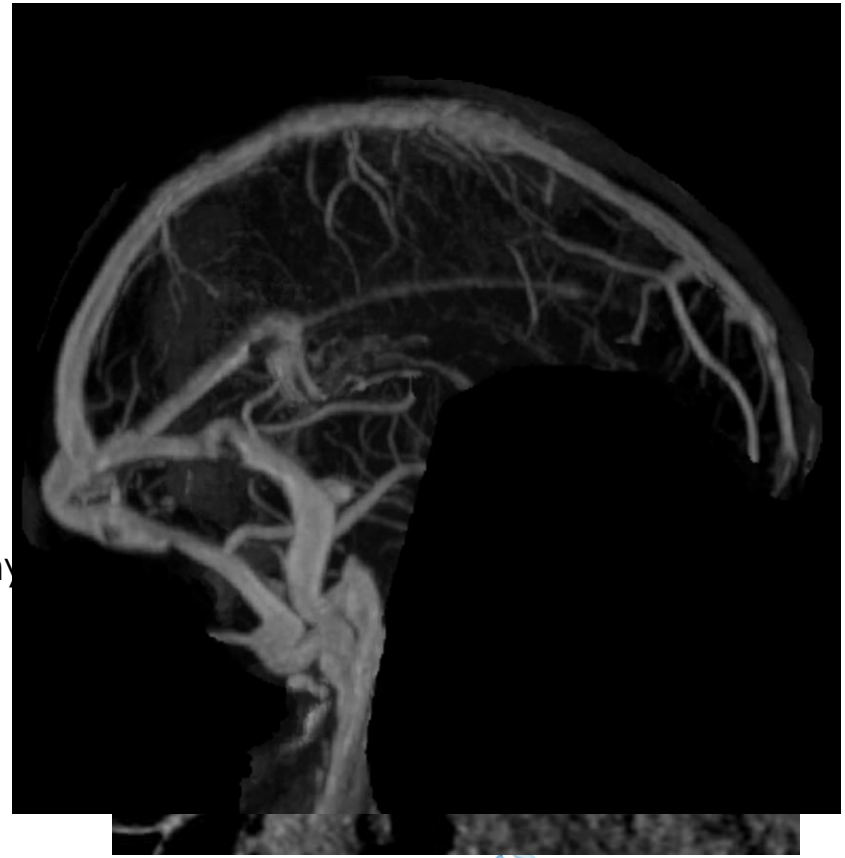
Verbist, Berit, Steve Connor, and Davide Farina. "ESR Essentials: diagnostic strategies in tinnitus—practice recommendations by the European Society of Head and Neck Radiology." *European Radiology* (2025): 1-10

What Imaging? Arteries AND Veins

- **Common Causes:**
  - **Arterial:** Stenosis, Fibromuscular Dysplasia (FMD), Dissection, Aneurysm, Aberrant Carotid.
  - **Venous:** Sinus Stenosis, Sinus Diverticulum/Aneurysm, Dehiscence, High/Dehiscent Jugular Bulb.
  - **AV Shunts:** Dural Arteriovenous Fistula (DAVF).

Imaging Modalities: CT Angiography/Venography (CTA/CTV) or MR Angiography/Venography (MRA/MRV) are typically required. Protocol choice depends on clinical factors and local availability.

If MRA/MRV, request it ***with contrast***



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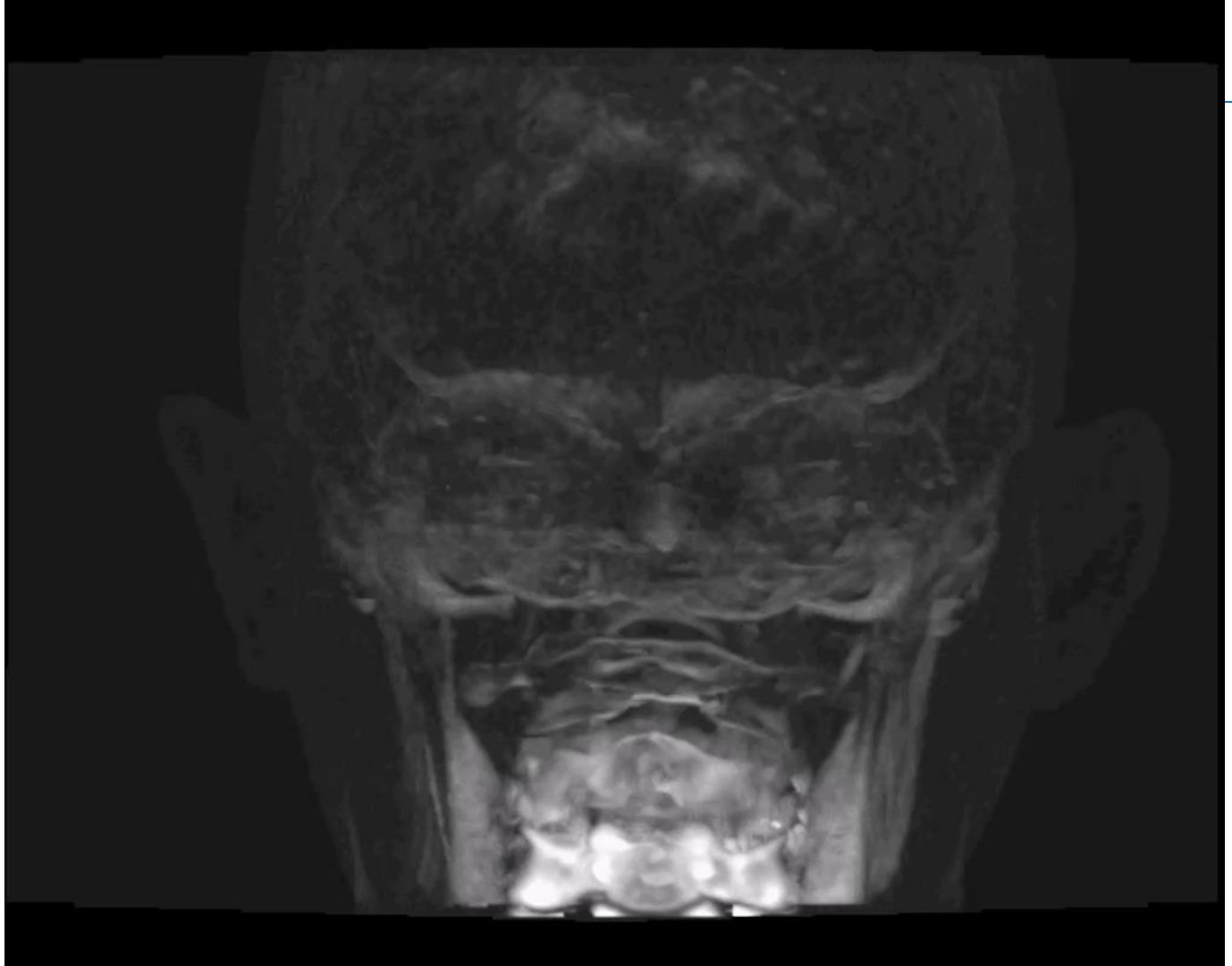
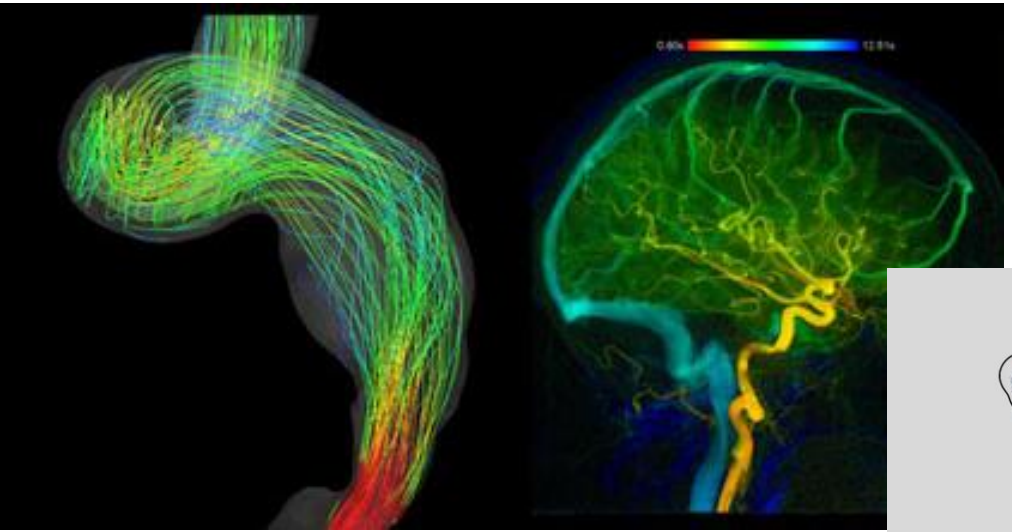
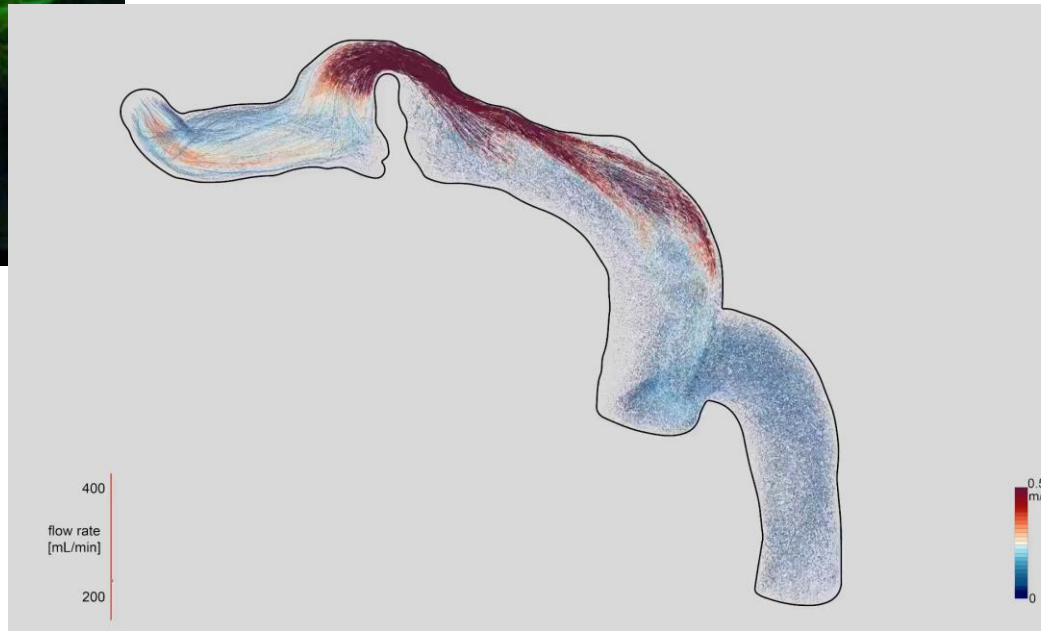


Pathophysiology

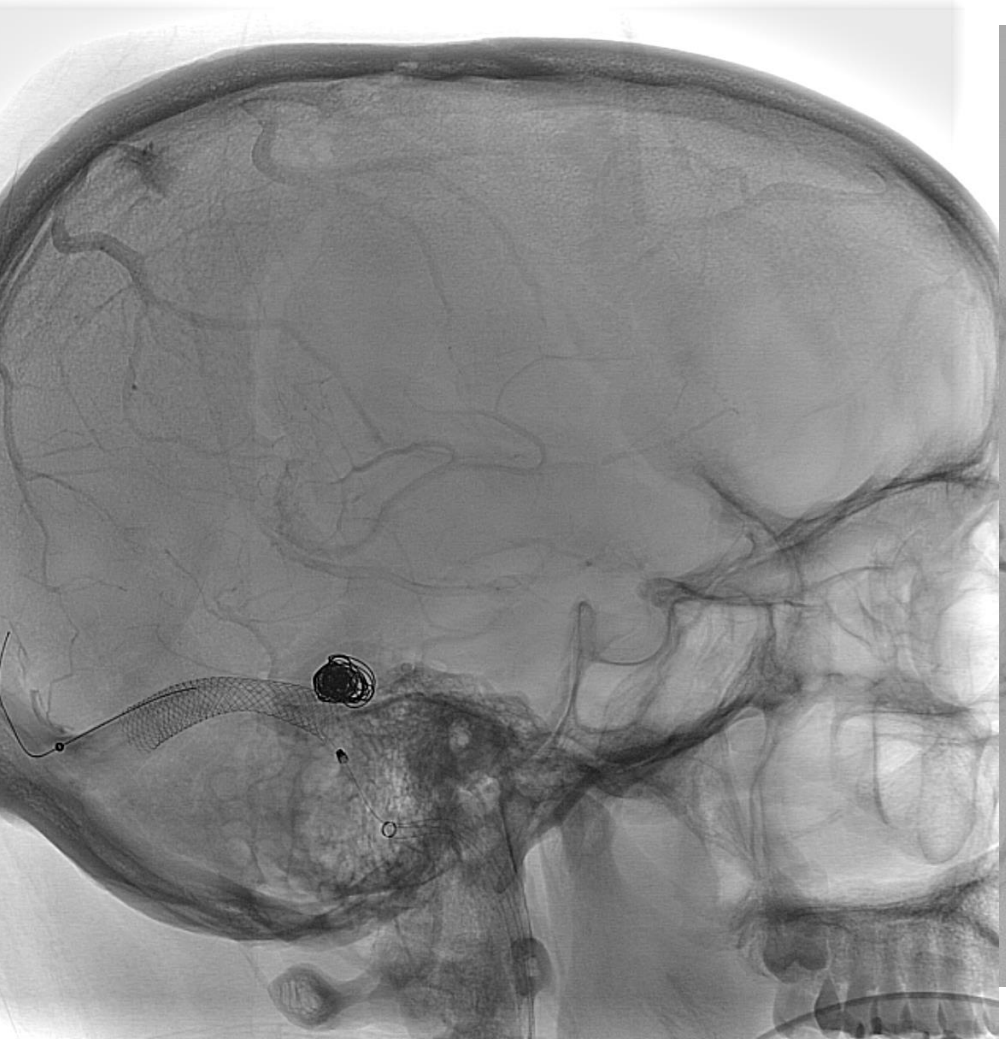




Who Reads It? The NeuroIR Difference

Expert Interpretation is Key!

- **Problem:** Subtle but significant findings (esp. venous anomalies, specific DAVF types) can be missed on standard reads
- **Solution:** Request or ensure review by a **Neuro-Interventional Radiologist** (or neuroradiologist with specific expertise in PT vascular causes)
- **Why:** We specialize in interpreting the complex skull base vascular anatomy and flow dynamics relevant to PT. We know what subtle signs to look for that indicate a treatable cause




448
60 ms
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Key Takeaways for Primary Care

1. Listen & Examine: Identify true PT. Don't forget the jugular compression test!

2. Refer Wisely: ENT First to rule out common causes

3. Image Appropriately: If true PT persists, **image arteries AND veins** (CTA/CTV or MRA/MRV *with contrast*)

4. Expert Read: Ensure imaging is reviewed by **NeuroIR** or specialised neurorad for subtle vascular causes

5. Offer Hope: Remember, ~50% have a treatable cause!

Thank you

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