

AMSER Case of the Month

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63-year-old female with palpable lump in thenar region of right palm and right forearm discomfort



Robert Ranger, MS4
Saba University School of Medicine

Joel Thompson, MD
Rochester General Hospital



Patient Presentation

- **HPI:** Patient presented to IR clinic with a chief complaint of **palpable lump in the thenar region of right palm and right forearm discomfort**. She first noticed the lump 15 to 20 years prior, which has remained stable since. Discomfort occurs and is worse after working long hours using a mouse, vacuuming, and sleeping on her right side. Wrist and forearm wraps help alleviate symptoms.
- **Past Medical History:** Hyperlipidemia, hypothyroidism
- **Past Surgical History:** Bunionectomy (1970)
- **Allergies:** Penicillin, sulfa antibiotics, codeine
- **Medications:** Levothyroxine
- **Social History:** Never smoker

Patient Presentation

- Physical Exam

Vitals: BP: 135/90 mmHg, Pulse: 59 bpm, T: 97.8°F, Weight: 66.8 kg, SpO2: 97%

Extremities: atraumatic, 2 x 2 cm lump of right palm thenar region. “Puffiness” of anterolateral right forearm with bluish discoloration from wrist to cubital fossa. No associated pulsations or thrill.

Lungs: clear to auscultation bilaterally.

Cardiac: S1, S2 audible, regular rate and rhythm.

Abdomen: soft, non-distended, non-tender to palpation.

Pertinent Labs

- **Platelets:** 250 000/ μ L
- **INR:** 0.9
- **Creatinine:** 0.8 mg/dL
- **WBC:** 4700/ μ L
- **Hgb:** 13.4 g/dL
- **TSH:** 0.08 mIU/mL (low), **free T4:** 1.3 ng/dL (normal)

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Clinically Suspected Vascular Malformation of the Extremities

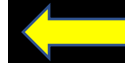
Variant 1:

Upper or lower extremity. Suspected vascular malformation presenting with pain or findings of physical deformity including soft-tissue mass, diffuse or focal enlargement, discoloration, or ulceration. Initial imaging.

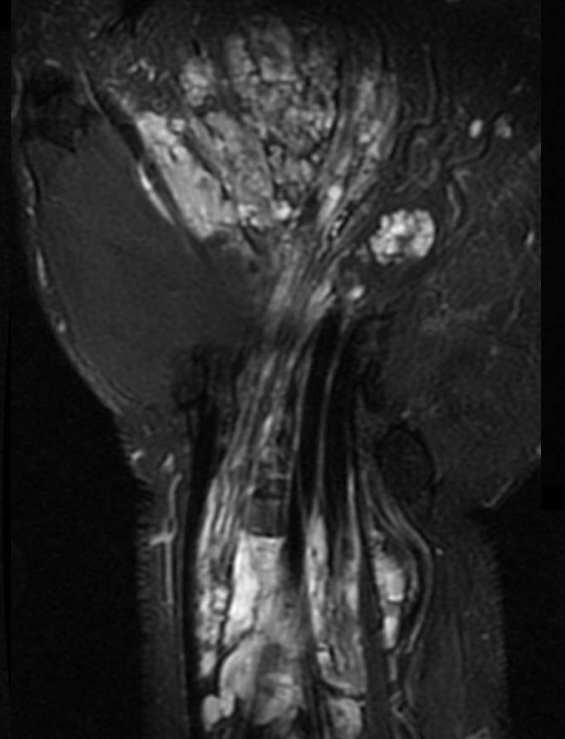
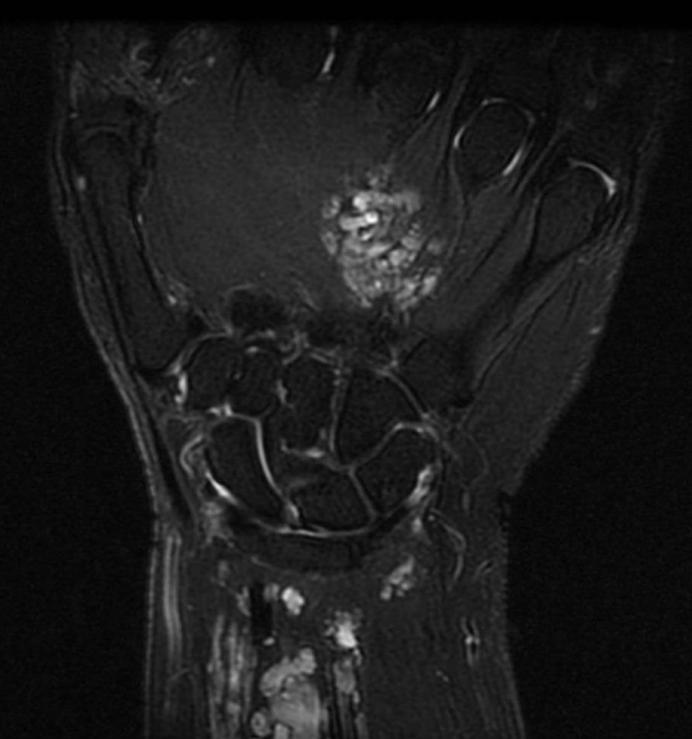
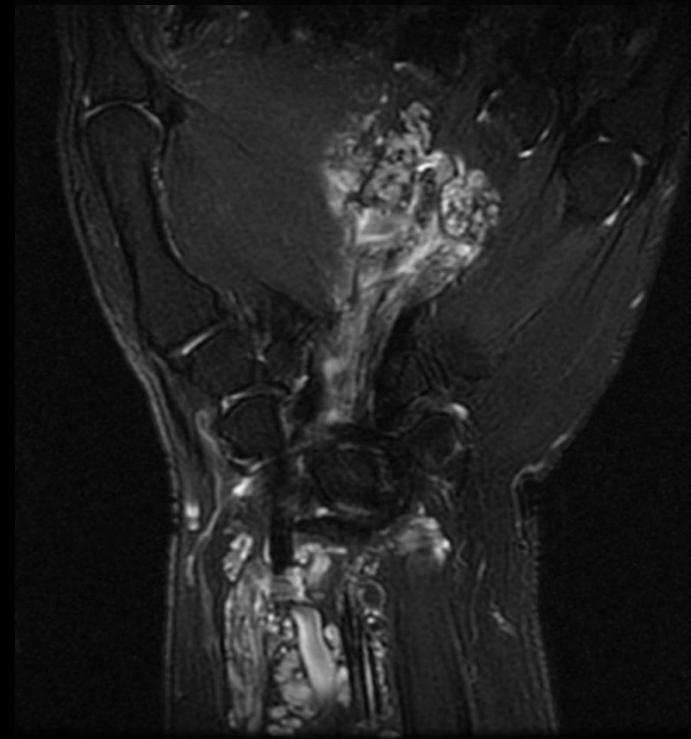
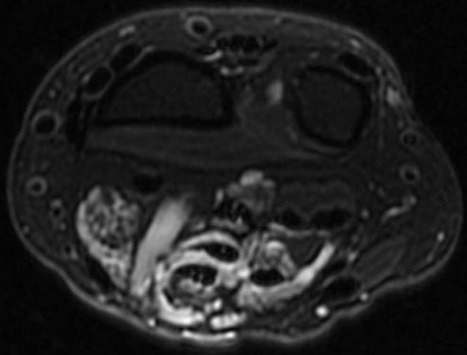
Procedure	Appropriateness Category	Relative Radiation Level
MRA extremity area of interest without and with IV contrast	Usually Appropriate	0
MRI extremity area of interest without and with IV contrast	Usually Appropriate	0
CTA extremity area of interest with IV contrast	Usually Appropriate	Varies
US duplex Doppler extremity area of interest	Usually Appropriate	0
MRA extremity area of interest without IV contrast	May Be Appropriate	0
CT extremity area of interest with IV contrast	May Be Appropriate	Varies
MRI extremity area of interest without IV contrast	May Be Appropriate	0
US extremity area of interest with IV contrast	May Be Appropriate	0
CT extremity area of interest without IV contrast	May Be Appropriate	Varies
CT extremity area of interest without and with IV contrast	Usually Not Appropriate	Varies
Radiography extremity area of interest	Usually Not Appropriate	Varies
Arteriography extremity area of interest	Usually Not Appropriate	Varies



These imaging modalities were ordered by the patient's primary care physician and IR attending



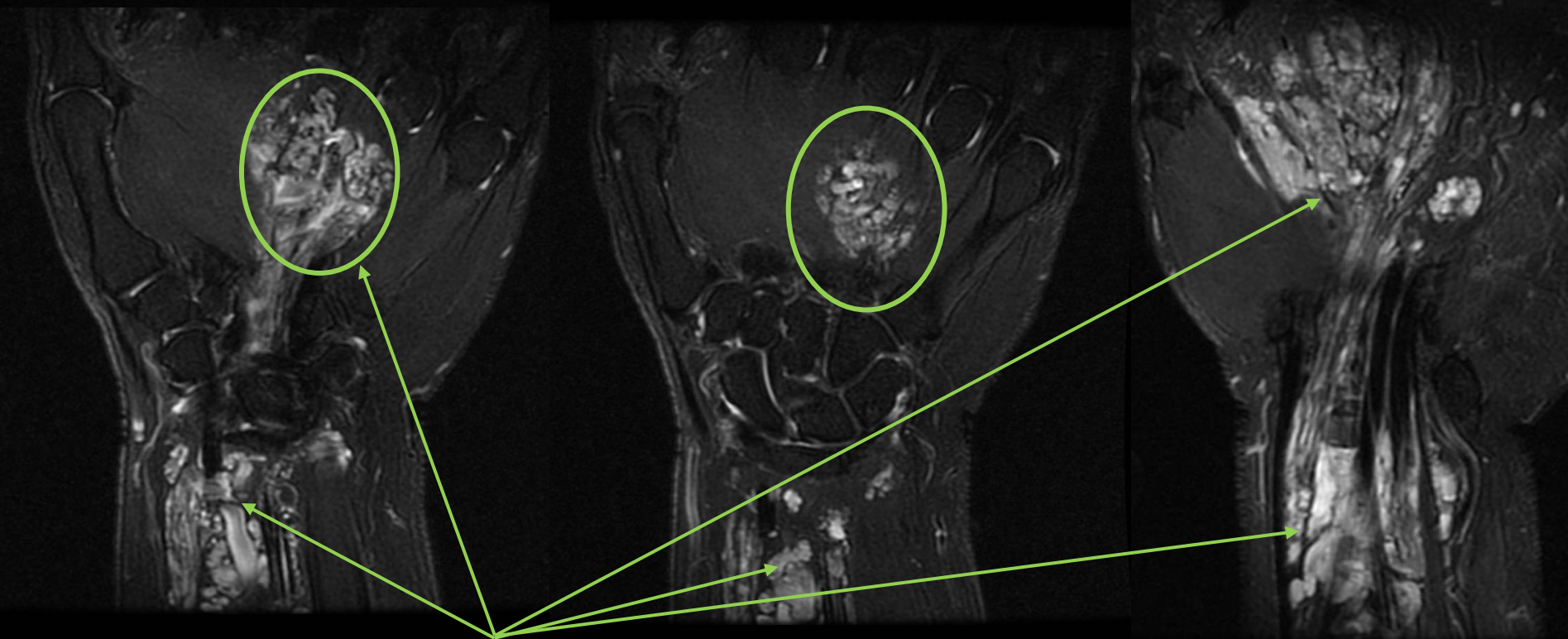
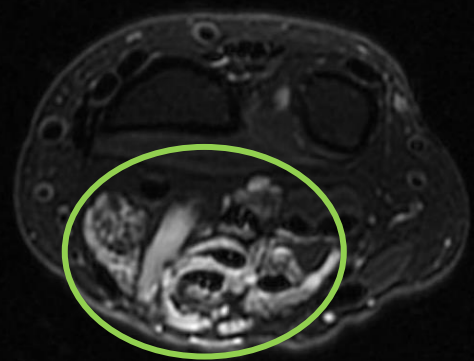
Findings (unlabeled)



Findings (labeled)

T2-weighted fat saturation FSE

T1 without contrast

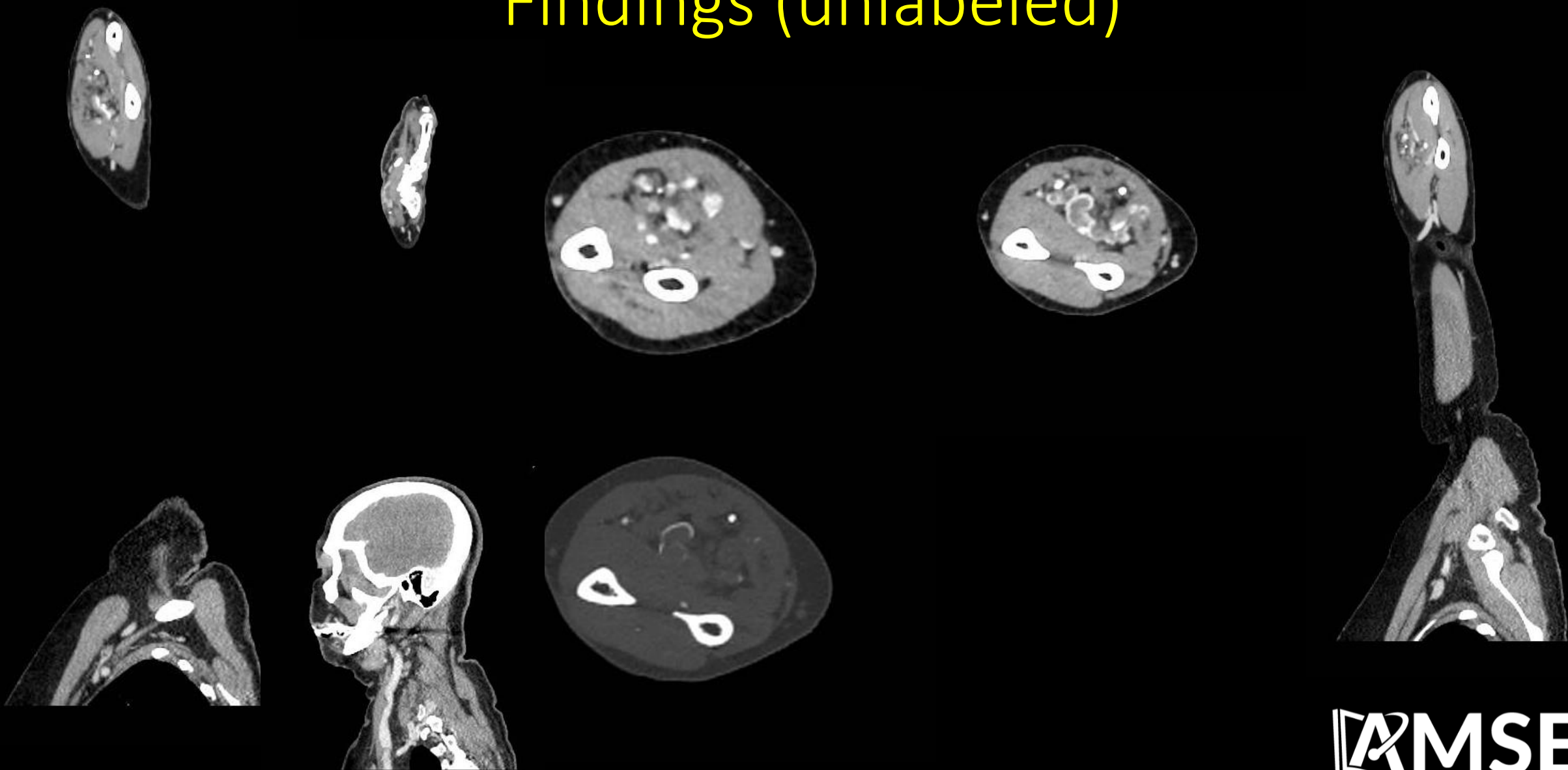


High signal on T2, tubular, tortuous

Intermediate to high signal relative to muscle on T1

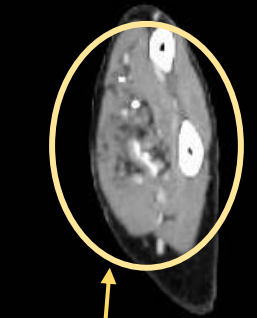
Large, bilobed venous malformation extending from the right thenar eminence through the wrist and into the right forearm

Findings (unlabeled)



Findings (labeled)

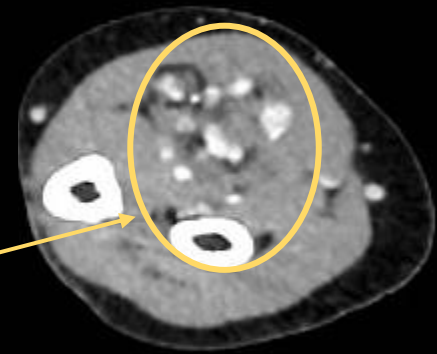
Venous malformation within the volar aspect of the right forearm



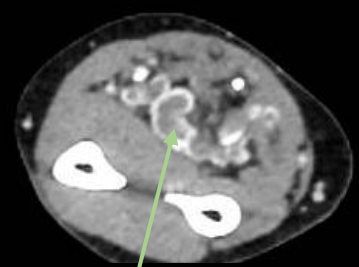
Within the flexor compartment in the forearm there is a cavernous venous malformation, which extends to the palmar aspect of the wrist and hand.



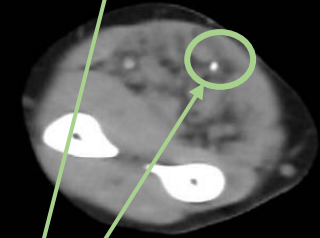
Venous phase



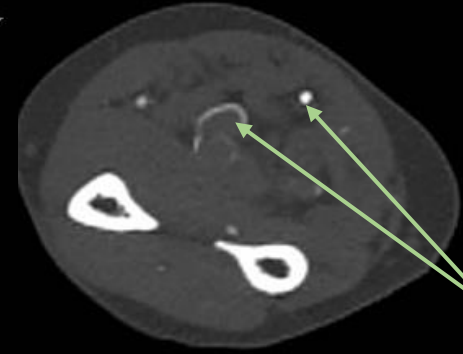
Venous phase



Non-contrast



Non-contrast, bone window



Similar attenuation to muscle; associated **phleboliths** from **calcified clots** secondary to stagnant blood flow.



Final Dx:

Large venous malformation within the volar aspect of the right forearm extending to the wrist

Case Discussion

Venous Malformations

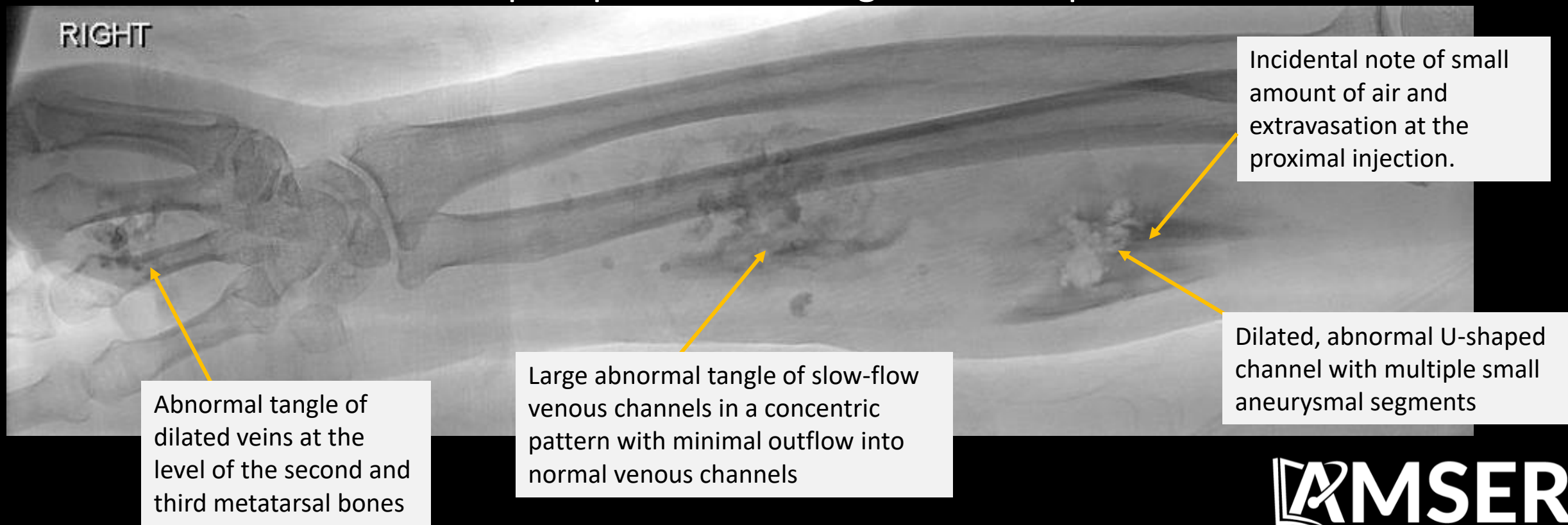
- 1 to 2 per 10 000 incidence, 1% prevalence
- Predominantly located in the head and neck and extremities (40%)
- Can arise in the skin, subcutaneous tissue, and muscle, majority sporadic (>90%)
- Abnormal development of vein wall, often dilated, tubular/tortuous
- **Phleboliths** (“calcified thrombi”) are highly indicative
- **Signs and symptoms** include pain, swelling, blue/purple skin discoloration, soft tissue mass, palpable phleboliths, thrombi due to stagnant flow.
- A slow-flow malformation. Other vascular malformations include high-flow (AVMs and fistulas), lymphatic (slow-flow), and capillary.

Case Discussion

- **Diagnosis:** Suspected by physical exam. Imaging features include:
 - Ultrasound would show “ill- or well-defined hypoechoic/anechoic mass of heterogeneous echotexture with multiple cystic spaces”, with no detectable Doppler signal or low-rate monophasic flow.
 - CT extremity with IV contrast: identifies feeding arteries, nidus, and draining veins, lesion extent and invasion into surrounding tissue.
 - MRI preferred due to greater soft-tissue contrast and anatomic detail than other imaging modalities. Preferably with contrast to distinguish from lymphatic malformations (only walls enhance)
- **Management:** Symptomatic with compression therapy to mitigate vascular stasis. Indications for intervention include bleeding, refractory or disabling pain, functional impairment, recurrent thrombosis, excessive cosmetic issues, and proximity to critical structures
 - **Sclerotherapy** is considered the first-line gold-standard treatment
 - May require multiple embolizations over time

Outcome

- Patient underwent successful **percutaneous ultrasound-guided access** with **fluoroscopic-guided venography** and **embolization of a right forearm and hand venous malformation** with **0.75% sodium tetradecyl sulfate (STS) sclerosant**. Noted to have minimal pain prior to discharge. Follow-up in one month.



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