Percutaneous Pre-operative Embolization of Forehead AVM

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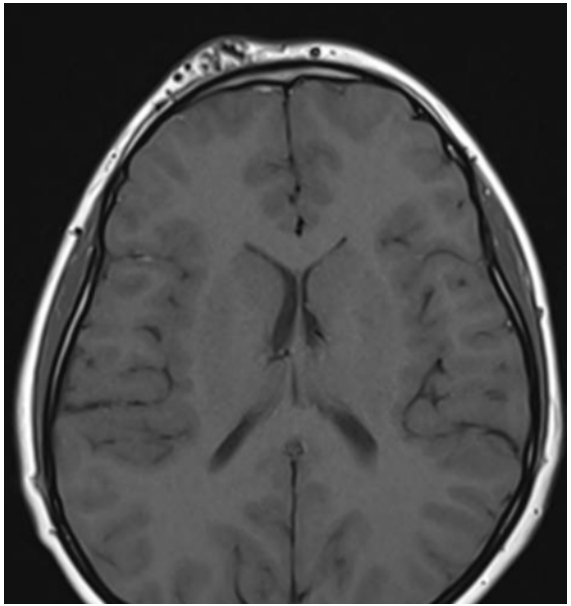
Assistant Professor, Neurosurgery

University of South Florida

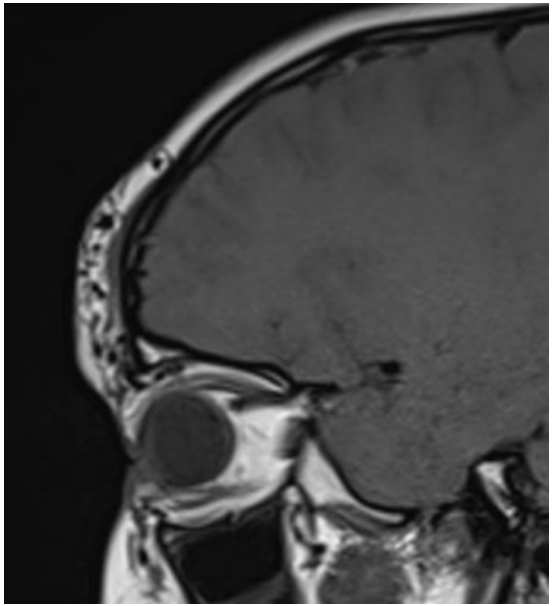
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Clinical Presentation

- 13-year-old male with initial presentation included swelling and redness of the right forehead with extension under the right eye, accompanied by headaches.



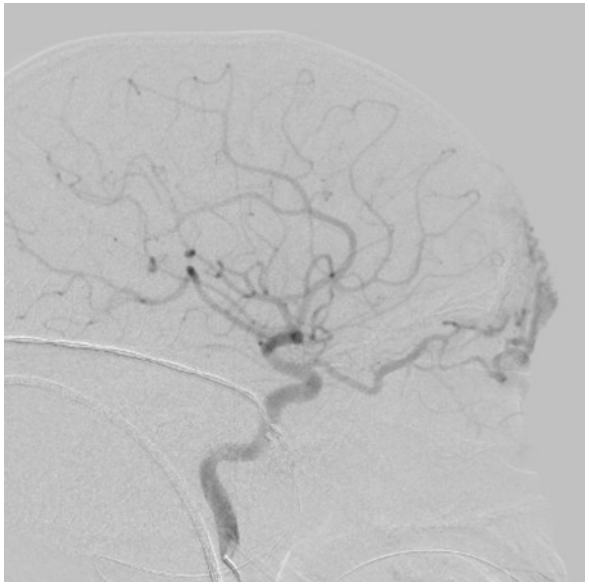
Ax T1



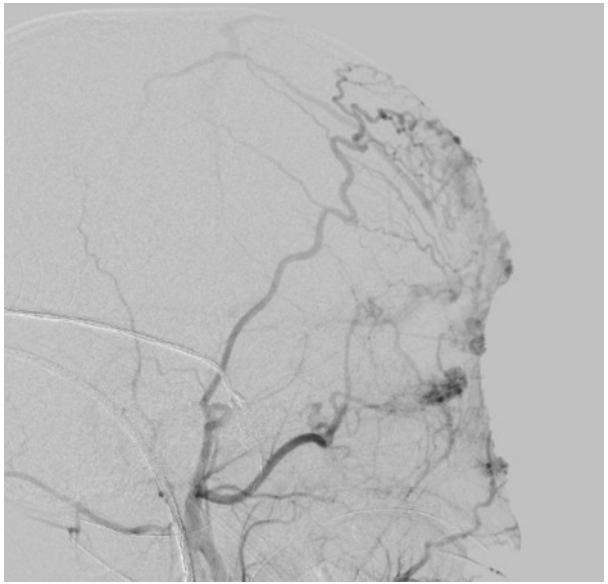
Sag T1

AVM Supply

- AVM Supplied from bilateral ICA via ophthalmic artery to angular branch of facial artery and bilateral ECA via Superficial Temporal Arteries



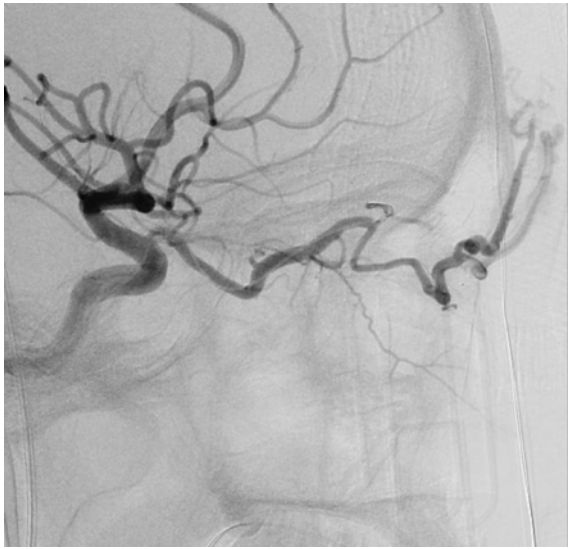
Right ICA (LAT)



Right ECA (LAT)

Ophthalmic Artery Embolization

- Large feeding branches from right ophthalmic artery embolized with coils to decrease flow and protect from reflux of liquid embolic agent (Onyx)



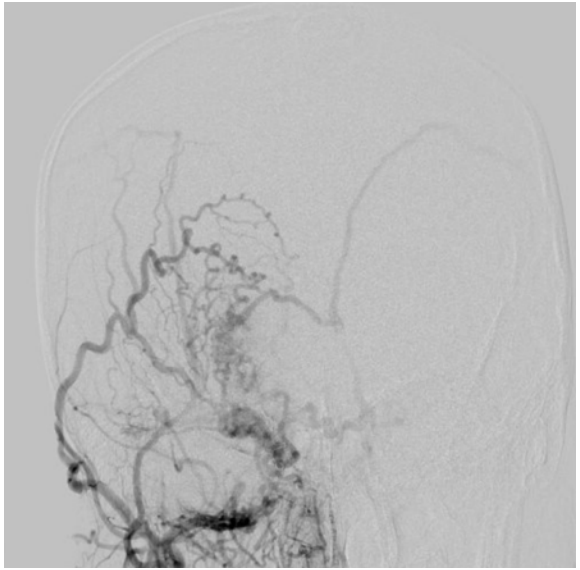
Right ICA
(Pre Embolization)



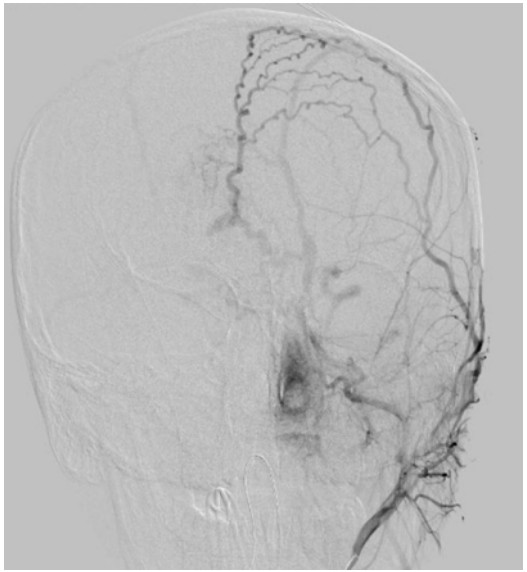
Right ICA
(Post Embolization)

Bilateral ECA Supply via Superficial Temporal Branches

- Due to complex supply to AVM from bilateral STA branches, direct puncture to AVM nidus performed followed by direct puncture of feeding STA branches.

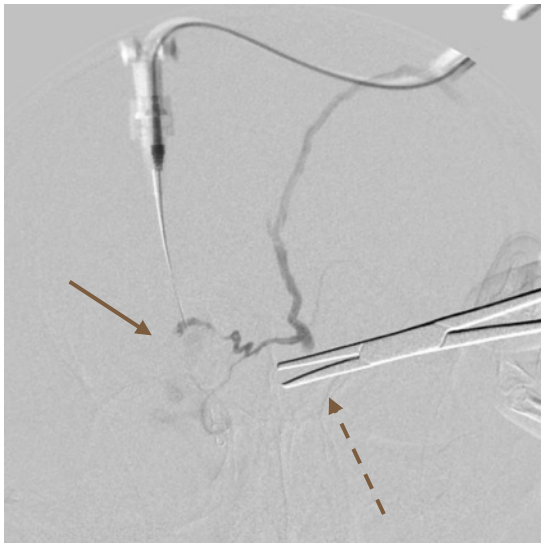


Right ECA (AP)

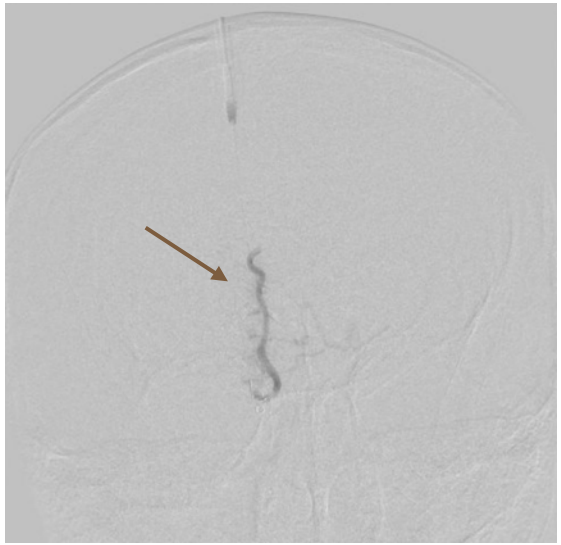


Left ECA (AP)

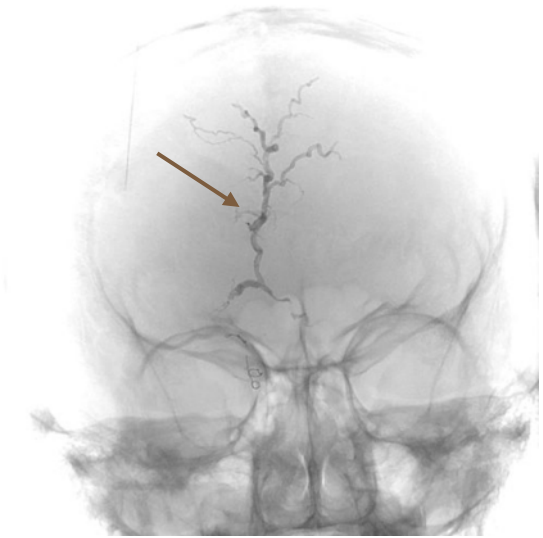
Percutaneous Embolization with Onyx



AVM Nidus (AP)*



Feeding Trunk (AP)



Onyx Cast(AP)

*Compression of collateral venous drainage to cavernous sinus (dashed arrow)

Post embolization course

- Patient was taken directly from angiography to operating room post embolization.
- AVM was resected and patient discharged home same day.
- At one month follow-up patient was doing well clinically.

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Take Home Points

- Percutaneous embolization provides a safe alternative pathway for pre-operative embolization of forehead AVMs.
- Embolization of deep venous drainage to cavernous sinus should be avoided and can be achieved by compression of superficial venous outflow pathways

