



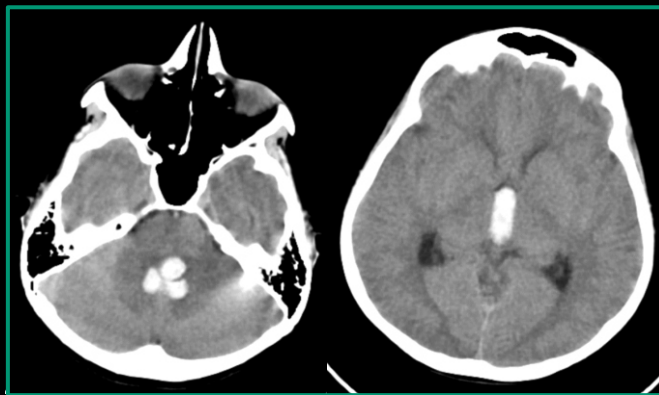
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MRI Images

Case 13: Arterio-venous Malformation

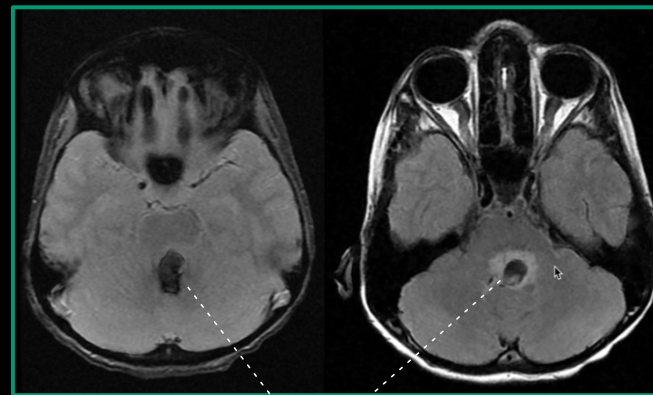
An arteriovenous malformation (AVM) is an abnormal tangle of blood vessels that causes shunting of blood from arteries to veins. AVMs most often occur in the spinal cord and in the brain. These AVMs usually presents with spontaneous intracranial hemorrhage (ICH), seizures, or headache typically in young adults. In some of the patients it may be detected incidentally on MRI or CT scan. Definitive treatment is required only when AVM ruptures as there is four fold increase in risk of rebleed in these patients. Current treatment options include conservative management, surgical resection, stereotactic radiosurgery (SRS), endovascular embolization, or combinations of these treatments (multimodal therapy). The primary goal of these interventions is complete elimination of the nidus and the arteriovenous shunt to prevent recurrence of haemorrhage.

12 YEAR OLD BOY

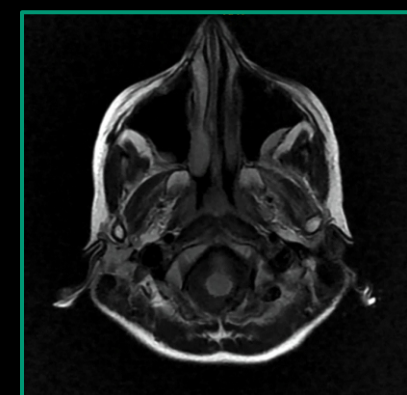
- Presented with acute onset severe headache and vomiting followed by drowsiness
- On admission he was drowsy arousable, pupils were reacting but sluggish, had up-gaze and left lateral gaze palsy, bilateral - right more than LMN facial palsy and palatal weakness and quadriparesis
- CT brain showed intra-ventricular bleed predominantly in 4th and 3rd ventricle with brainstem oedema and mild hydrocephalous



CT brain showing 4th and 3rd
Intra-ventricular bleed



MRI GRE and FLAIR images showing 4th intra-
ventricular bleed with mass effect over brain stem



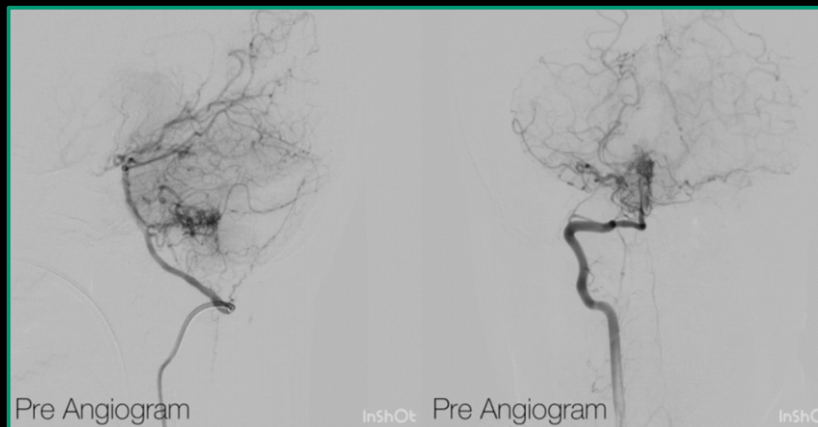
MRI FLAIR Images



Scan/click to view
Cath Images

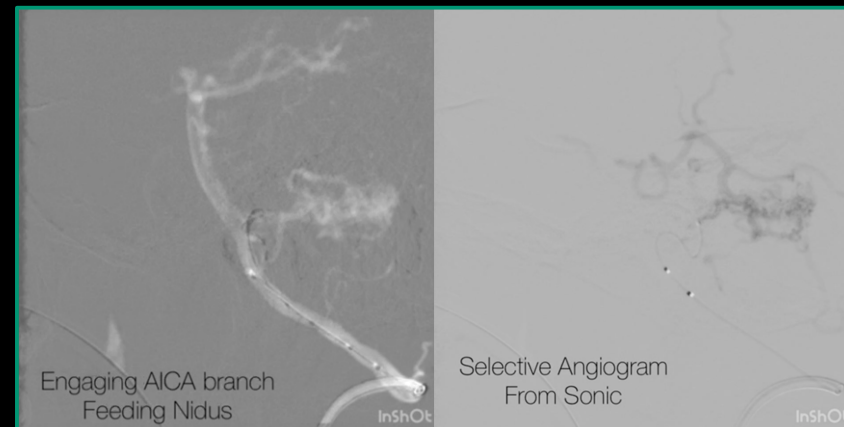
- He underwent DSA which showed AVM with feeders from right anterior inferior cerebellar artery (AICA)

DSA showing posterior fossa AVM with feeder from right AICA



DSA Lateral View

DSA Towne View



Engaging right AICA branch feeding nidus with Sonic
Micro-catheter and selective angiogram

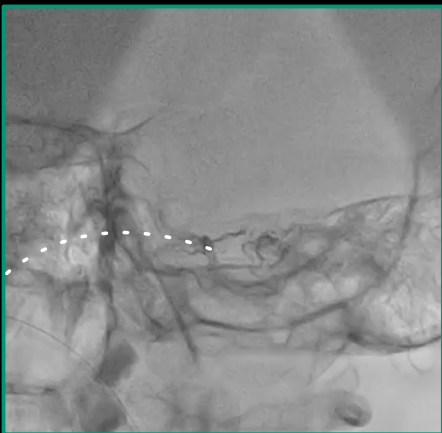
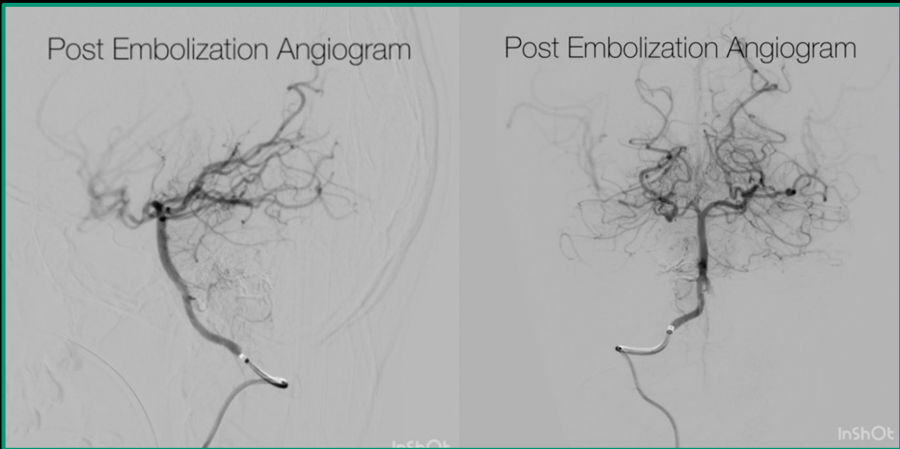
- He required intubation and ventilation in view of neurological deterioration and increase in drowsiness
- He underwent AVM embolisation 2 days later
- Gradually patient stabilised, became conscious more alert and had quadriparesis left more than right
- In view of lower cranial nerve palsies, he could not be extubated and later underwent tracheotomy



Scan/click to view is
Patient's clinical status

- Gradually he was weaned off ventilator and was mobilised with intensive physiotherapy
- As he improved he was discharged on tracheotomy tube after 3 weeks
- He was de-cannulated during follow up nearly 2 months after discharge

Post embolisation angiogram complete obliteration of the AVM



Squid Cast



Posterior fossa AVM SQUID embolisation



DURAL ARTERIO VENOUS FISTUAL (DAVF)

Intracranial DAVFs are pathologic dural-based shunts which derive their arterial supply primarily from meningeal vessels, and the venous drainage is either via dural venous sinuses or through the cortical veins. DAVFs have a reported association with dural sinus thrombosis, venous hypertension, previous craniotomy, and trauma, though many lesions are idiopathic.

Clinical presentation varies significantly depending upon location like pulsatile tinnitus, ophthalmoplegia, proptosis, chemosis, retro-orbital pain, or decreased visual acuity. Other presentations include intracranial haemorrhage, seizures, parkinsonism, cerebellar symptoms, apathy, failure to thrive, progressive dementia and cognitive decline which may improve after treatment.

The diagnosis is dependent on a high level of clinical suspicion and high-resolution imaging, however conventional digital subtraction angiography (DSA) remains the most accurate method for complete characterization and classification of DAVFs.

During the past 2 decades, embolization by using transarterial, transvenous, or combined approaches has become a first-line treatment for DAVFs. Microsurgical resection or stereotactic radio-surgery is considered only in select patients where endovascular treatment is not feasible