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RIGHT PARIETAL DURAL ARTERIOVENOUS FISTULA WITH VENOUS ANEURYSM PRESENTING AS INTRAPARENCHYMAL , SUBARACHNOID AND EXTRA-AXIAL HEMORRAGE

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Abstract

AIM AND OBJECTIVE: *To Review The Findings To DURAL AV FISTULA With Venous Aneurysm Under Different Imaging Modalities.*

BACKGROUND AND PURPOSE:*Venous Drainage Patterns Are A Major Determinant Of Clinical Outcome In Intracranial Dural Arteriovenous Fistula (DAVF) Patients. In This Study, We Sought To Identify MR Imaging Finding Differences Between DAVF Types Classified On The Basis Of Venous Drainage Patterns.*

METHODS AND MATERIALS:

Plain CT Was Done Which Showed Extra Axial Hemorrhage, Subarachnoid Hemorrhage And Intraparenchymal Hemorrhage In Right Parieto-Temporal Lobe.

CT CEREBRAL ANGIOGRAPHY Was Done For Further Evaluation Features Were Suggestive Of DURAL AV FISTULA WITH VENOUS ANEURYSM.

Then CEREBRAL DSA Was Done to Confirm the Feeders.

SUMMARY: *In A Setting ofNon-Traumatic Headache and Imaging Findings Consistent with Intraparenchymal, Extra-Axial And Sub Arachnoid Hemorrhage, This Condition Must Be Kept In Mind.*

Multi-Modality Imaging Plays A Key Role In Early And Accurate Diagnosis As It Is A Potentially Treatable Condition.

Dural AV Fistulas Are A Difficult Diagnosis To Make On Imaging Alone, Hence Close Co-Ordination With The Neurology Department Is Important To Arrive At The Diagnosis.

Keywords

AV FISTULA, CEREBRAL DSA, MIDDLE MENINGEAL ARTERY, STROKE, DURAL AV FISTULA.

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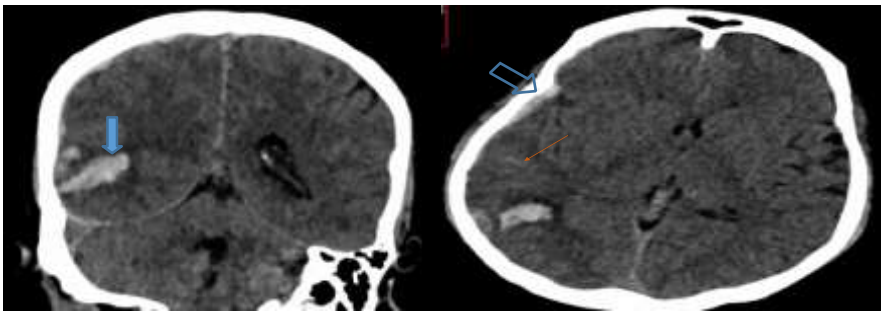
I. AIMS AND OBJECTIVES

TO REVIEW THE FINDINGS TO DURAL AV FISTULA WITH VENOUS ANEURYSM UNDER DIFFERENT IMAGING MODALITIES.



CLINICAL PRESENTATION-

Recurrent episodes of headache in the parieto occipital region radiating to neck

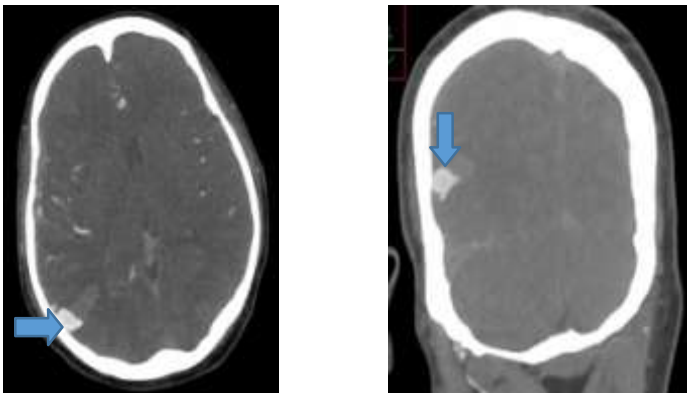
No history of trauma/seizures

No history of fever, neck rigidity and sensory or motor deficits.**-**

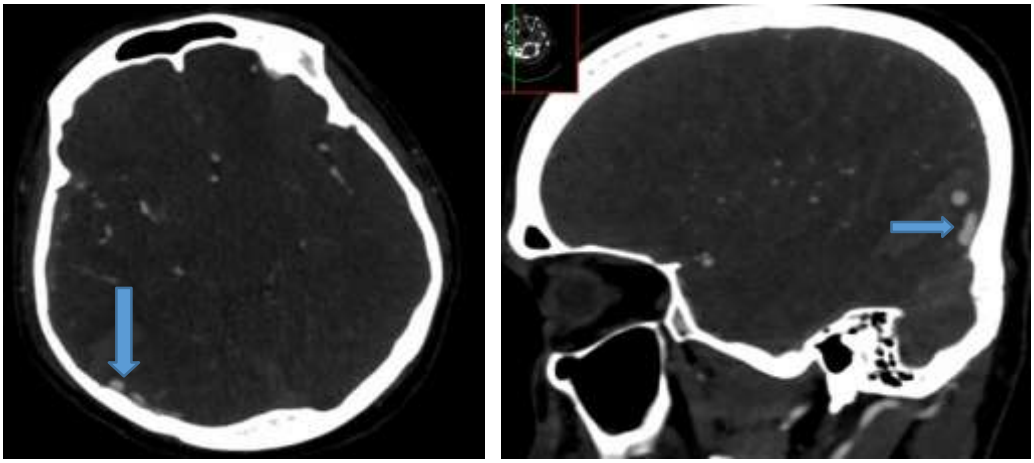
II. MATERIALS AND METHODS

Plain CT revealed extra axial hemorrhage along right parieto-temporal convexity(white arrow) and subarachnoid hemorrhage(red arrow) and intraparenchymal hemorrhage(blue arrow) in right parieto-temporal lobe.

CT Cerebral angiography was done for further evaluation



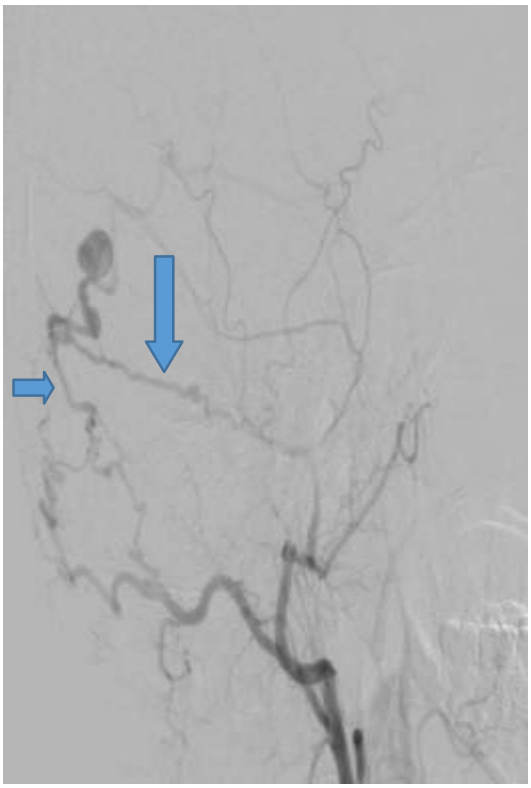
Focal aneurysmal dilation of dural vein(blue arrow) noted with surrounding hemorrhage

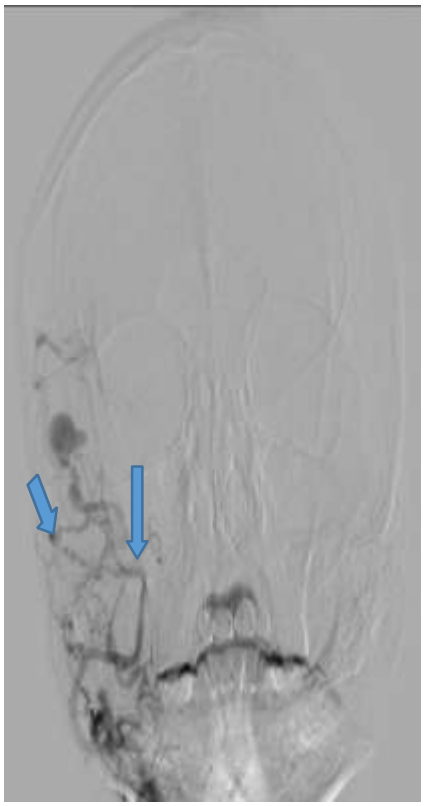


We can appreciate prominent cortical veins(blue arrow)

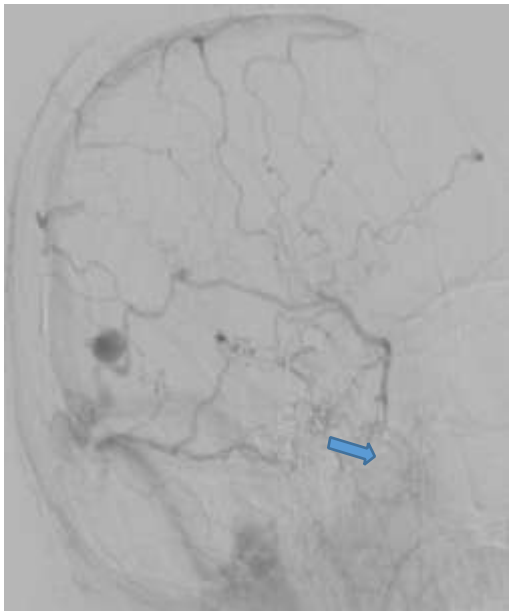
- FEATURES ARE SUGGESTIVE OF DURAL AV FISTULA WITH ANEURYSM

CEREBRAL DSA WAS DONE TO CONFIRM THE FEEDERS



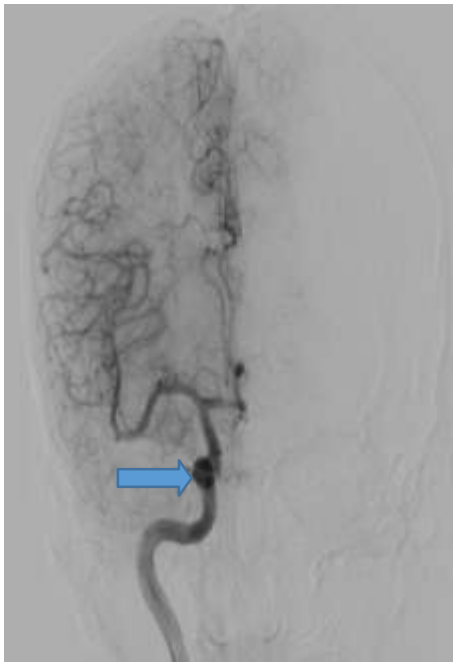


Selective angiogram of ECA revealed feeders from occipital artery(small arrow) and middle meningeal artery(big arrow)




Aneurysm was confirmed to be at the venous end and is seen draining into the pterygoid plexus(thin arrow) and superior sagittal sinus(thick arrow)

There is no evidence of reflux or thrombosis hence is concluded to be COGNARD TYPE I DURAL AV FISTULA WITH VENOUS ANEURYSM.

No feeders noted from ipsilateral ICA No feeders from contralateral ICA AND ECA

III. SUMMARY

In a setting of non-traumatic headache and imaging findings consistent with intraparenchymal, extra-axial and sub arachnoid hemorrhage, this condition must be kept in mind. Multi-modality imaging plays a key role in early and accurate diagnosis as it is a potentially treatable condition.
Dural AV fistulas are a difficult diagnosis to male on imaging alone hence close co-ordination with neurology department is important to arrive at the diagnosis.

IV. DISCUSSION

1. Dural arteriovenous fistula is the second major type of cerebrovascular malformation that exhibits arterio venous shunting.
2. They exhibit a spectrum of biological behavior that ranges from relatively benign to catastrophic intracranial hemorrhage.
3. As most dAVFs arise adjacent to the skull base, multiple enlarged dural and trans osseous branches arising from the external carotid artery (ECA) are usually present
4. An incidence of **13–21%** has been cited in cohort studies for the association of pial or dural AVF with cerebral aneurysms.

ETIOLOGY-
1. IDIOPATHIC (MOST COMMON)
2. TRAUMA
3 CHRONIC DURAL VENOUS SINUSES

CLINICAL PRESENTATION-
Bruit and/or tinnitus.
dAVFs in the Cavernous Sinus cause pulsatile proptosis, chemosis, retroorbital pain, bruit, and ophthalmoplegia
Malignant dAVFs, lesions with cortical venous drainage, may cause seizures and progressive dementia in addition to focal neurologic deficits.

COGNARD CLASSIFICATION OF dAVFs
(PREFERRED)
Grade1:In sinus wall; normal antegrade venous drainage (low risk; benign clinical course)
Grade2A:In sinus; reflux to sinus, not cortical veins
Grade2B:Reflux (retrograde drainage) into cortical veins (10-20% hemorrhage)
Grade3:Direct cortical venous drainage; no venous ectasia (40% hemorrhage)
Grade4:Direct cortical venous drainage + venous ectasia (65% hemorrhage)
Grade5:Spinal peri medullary venous drainage

BORDEN CLASSIFICATION OF dAVFs.
(ALTERNATIVE)
Type I: Dural arterial supply with antegrade drainage into venous sinus
Type Ia: Simple dAVF with single meningeal arterial supply
Type Ib: Complex dAVF with multiple meningeal arteries
Type II: Dural supply + ↑ intrasinus pressure → antegrade sinus, retrograde cortical venous drainage

DIFFERENTIAL DIAGNOSIS:
1.Acute dural venous sinus thrombosis with prominent collateral venous drainage creating a "pseudophlebitic" pattern on MR and DSA – most common.
2.Chronic dural venous sinus thrombosis.
3.A pial AVM or fistula is rare and represents a direct arteriovenous shunt between a brain parenchymal ("pial") artery and a dilated cortical draining vein. These occur along the brain surface or within the brain itself, not within a dural venous sinus.
4.Rarely, a dAVF adjacent to the brainstem can incite T2/FLAIR hyperintensity, mimicking an infiltrating glioma.

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