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Arteriovenous Malformation of the Brain (AVM)

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Review Article

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Abstract: 34 year old male patient referred to a hospital complaining of headache, and concussion. The doctor requested a brain Magnetic Resonance angiography (MRI) and MRA. The Magnetic Resonance Angiography shows Arterial Venous Malformation of the brain (AVM) in the right cerebral hemisphere.
Keywords: MRI, MRA, AVM.

INTRODUCTION

An Arteriovenous Malformation (AVM) is a tangled ball of blood vessels with abnormal connections between arteries and veins. Arteriovenous malformations of the brain are congenital vascular lesions that affect 0•01 to 0•5% of the population.

Normally, arteries carry blood containing oxygen from the heart to the brain, and veins carry blood with less oxygen away from the brain and back to the heart. When an ArterioVenous Malformation (AVM) occurs, a tangle of blood vessels in the brain or on its surface bypasses normal brain tissue and directly diverts blood from the arteries to the veins [1].

Types of AVM

Arteriovenous (AV) fistula.

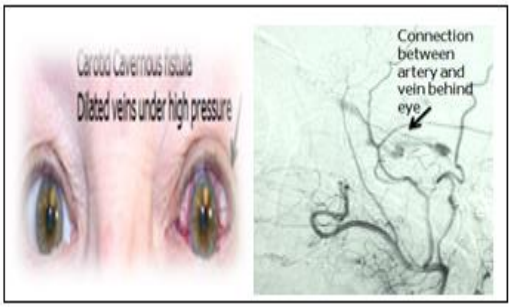

Fig-1: Cavernous fistula in the eye

Cavernous Malformation.

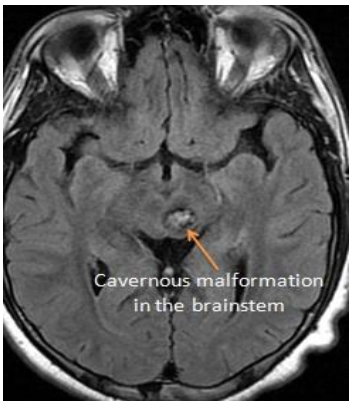

Fig-2: Axial MRI T1 weighted image

True Arteriovenous Malformation (AVM).

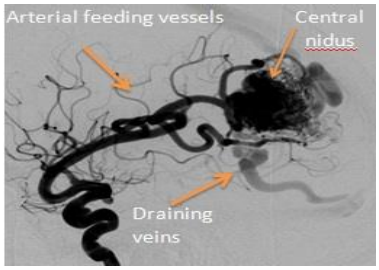

Fig-3: Cerebral angiogram shows there are three distinct components to each AVM

Developmental Venous Anomalies.

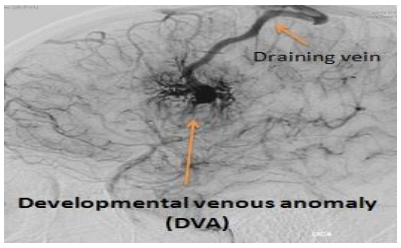

Fig-4: MRA of DVA

Capillary Telangiectasias.

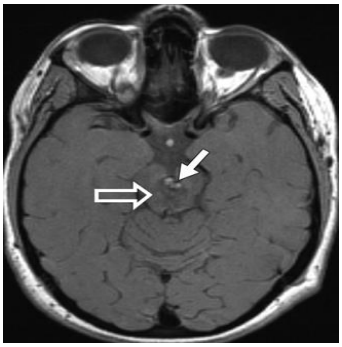

Fig-5: Axial MRI T1 weighted image

AVMs are more common in males than females [1].

Magnetic Resonance Angiogram (MRA)

The Magnetic Resonance Angiogram, MRA is a noninvasive test that has demonstrated usefulness in defining the anatomy of blood vessels of certain size in the head and neck. MRA serves as a complement to traditional MRI scanning in evaluation of the brain and neck [2].

A 34 year old male patient came to King Alhussein Medical City- JORDON, with headache, and concussion. The doctor requested a brain MRI, and MRA The patient was scanned by 1.5 Tesla MRI machine and the image of the patient was shown in (Fig-6,7,8,9,10).

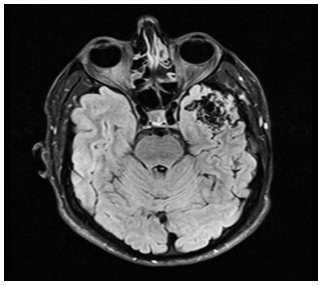

Fig-6: Axial MRI T1 weighted image shows AVM in the left cerebral hemisphere

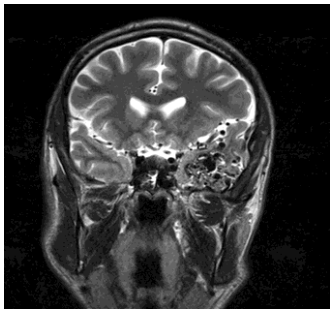

Fig-7: Coronal MRI T2 weighted image shows AVM in the left cerebral hemisphere

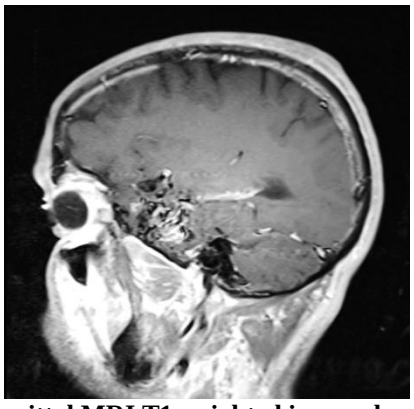

Fig-8: Sagittal MRI T1 weighted image shows AVM in the left cerebral hemisphere

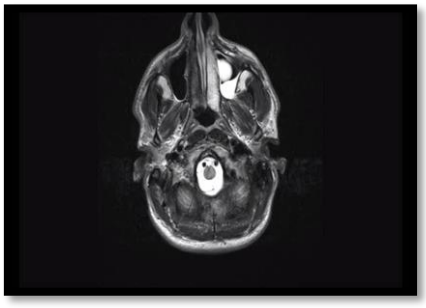

Fig-9: Scanning for axial MRI T2 weighted image shows AVM in the left cerebral hemisphere.

Fig-10: 3D MRA shows AVM in the left cerebral hemisphere

MRA showed that there was a web of massive blood collection in the left cerebral hemisphere.

DISCUSSION

To identify and characterize AVMs of the Central Nervous System CNS, including the brain and spinal cord, without the use of radiation or invasive techniques, MRI can be helpful. MRI is the examination of choice in patients with chronic headaches, seizure disorders of unknown etiology, and pulsatile tinnitus (among other conditions) [3].

MRI scans can demonstrate areas of parenchymal AVM involvement, showing both dilated feeding arteries and enlarged draining veins [4].

MRA and venography can further supplement conventional MRI in demonstrating in a near angiographic fashion the anatomy and microarchitecture of an AVM. MRI is the study of choice in the detection of vascular malformations of the spinal cord and spinal dura [5-7].

High-speed functional MRI with multi-slab echo-volumes imaging is an additional diagnostic tool [8, 9].

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