Results

Ten patients were include in our study, the main presenting symptoms of patients in this series were seizures (40%), headache(30%), focal neurological deficit (20%) and cerebral hemorrhage (10%) as shown in table (2)

Table (2) : Show the clinical presentation of the cases

Clinical presentation	No of cases
Seizures	4
Headache	3
Focal Neurological deficit	2
Cerebral Hemorrhage	1

Table (3): Shows the age distribution in the examined cases at the time of their presentation.

Age	No. of cases	Percentage
<20	1	10%
20-50	9	90%
>50	-	0%

Table (3) shows that the majority (90%) of cases having cerebral AVM presented between the 20-50 years of age.

The sex distribution in this series showed increased male to female ratio (8:2) i.e. male predominance.

Table (4): Classification of cases according to the type and location.

Patient No.	Type of the AVM	Location
1.	Parenchymal (pial)	Left deep parietal region
2.	Mixed (pial & dural)	Right occipittal region
3.	Parenchymal	Right occipittal region
4.	Parenchymal (complicated with haemorrhage)	Right parietal region
5.	Parenchymal	Left parietal region
6.	Parenchymal	Right parietal region
7.	Parenchymal	Right tempro- parietal region
8.	Parenchymal	Right parietal region
9.	Parenchymal	right temporal region
10.	Mixed (pial & dural)	left parietal region

Table (4) revealed that the majority of cases were pure parenchymal AVM(80% of patients) having supra-tentorial location.

The most common location of cerebral AVMs is the parietal region in our series.

Standard MR spin-echo was able to demonstrate the nidus of the AVM in all cases. It adequately assessed the size, topography and the presence of complications e.g. subacute cerebral hemorrhage as in cases no.(4) and detection of parenchymal changes e.g. gliosis, edema cases no. (6&8).

On the basis of MR imaging alone, it was often difficult to confidently determine the presence of the afferent feeding arteries (except if it is markedly dilated as in case no.(9) , small superficial draining veins .

The deep venous drainage only could be identified by MRI examination alone in 2 patients (cases no.2&10).

Table (5)

Patient No.	Components of AVM	MRI	3-D TOF angiography		Angiography
			Native	Gd-enhanced	
1-	A	0	+++	+++	+++
	N	+++	+++	+++	+++
	V	0	++	+++	+++
2-	A	+	+++	+++	+++
	N	+++	+++	+++	+++
	V	+	++	+++	+++
3-	A	0	+++		
	N	+++	+++	ND	ND
	V	0	0		
4-	A	0	+++		
	N	+++	+++	ND	ND
	V	0	0		
5-	A	0	+++		+++
	N	+++	+++	ND	+++
	V	0	0		+++
6-	A	0			
	N	+++	ND	ND	ND
	V	0			
7-	A	0			
	N	+++	ND	ND	ND
	V	0			
8-	A	0			
	N	+++	ND	ND	ND
	V	0			
9-	A	+			
	N	+++	ND	ND	ND
	V	0			
10-	A	0			
	N	+++	ND	ND	ND
	V	0			

N.B: A= feeding artery, N= nidus, V= venous drainage, +++ = exact anatomy, ++ = incomplete anatomy, + = Partial visualization, 0 = no visualization ND = Not done.

- The nidus detection and size obtained on either technique of MR angiography were comparable to those acquired by conventional angiography (see table 5)
- As show in table 5, it was found that (native) 3D TOF can detect the feeding arteries as conspicuous as conventional angiography,all the identified feeding arteries seen by conventional angiography were similarly detected by 3-D TOF in three patients (cases no.1&2&3) .
- Regarding the venous drainage, unenhanced 3D TOF was unable to define the draining veins in three cases (cases no. 3&4&5) and incomplete visualization of the drainage vein in the other 2 cases (no.1&2).
- Gadolinium enhanced 3D TOF had satisfactory improvement of the visualization of the venous drainage in comparable to (native) 3D TOF and conventional angiography regarded to (cases no. 1&2).
- Gadolinium enhanced 3D TOF showed no effect on the visualization of arteries.
- The discrepancy between the definition of the smaller branches of the main stem feeding arteries delineated on either MR angiography technique and those by conventional angiography was partly attributed to the nidus as it sometimes obscured the

adjacent small arteries clearly seen during the early arterial phase of conventional angiography .

- No aneurysms could be detected in the afferent feeding arteries in any of the studied cases .
- In the case No. 2 which is mixed pial and dural AVM, MR angiography findings suspected the presence of dural elements due to the visualization of dural vessels which were not usually seen on MR angiography. Yet, this could not be verified due to inability to selectively demonstrate the dural or cerebral arteries separately by 3D TOF MR angiography as the positioning of the presaturation slab in the neck for selective either external or internal carotid MR angiography alone was difficult.
- In case no.10 ,the markedly dilated vascular structures in both the left parietal and falcine regions with communication of the lesion with the superior sagittal sinus shown on MRI examination suggesting mixed (pial & dural) AVM.