Supratentorial multiple little meningiomas with transitory stroke symptoms like. MRI case presentation

E. Moldovanu[1,2], Adriana Moldovanu[1,2], Carmen Gherman[1,2], Cornelia Tudorache[2], Danisia Haba[2]

[1]Departamentul IRM "Supermeditest" Iaşi
[2]Departamentul de Radiologie şi Imagistică Medicală al Spitalului Clinic Universitar "Prof. Dr. N. Oblu", Iaşi

Abstract
We present the case of a 45 years patient explored by MRI, who had in the last three years more than 11 episodes of left or right sensitive hemiparesis, six of them associated with transitory aphasia. She was diagnosed with transitory ischemic attacks in both carotids arteries and treated with specific drugs, although she has no vascular risk factors. The two cerebral CT exams were in normal limits. The surprise came from MRI exam images, which disclosed two little meningiomas placed on the convexity, at the level of both parietal lobes. The conclusion was that all symptoms probably were produced by them, due the hemodynamic local tumoral modifications.

Keywords: astrocytic tumor, nucleor organizer region, tumoral grade

Purpose

To demonstrate the importance of the detailed MRI exam in fixing an accurate diagnose of the lesions involved in vascular stroke-like symptoms, especial in cases with no vascular risk factors and with normal CT exam.

Materials and Methods

We explored by MRI a 45 years patient with more than 11 episodes of left or right sensitive hemiparesis in the last three years, six of them associated with transitory aphasia. The two cerebral CT exams made were in normal limits and the final diagnose were "transitory ischemic attacks in both carotids arteries". She followed a specific neurological treatment with no positive results and so she arrived in our MRI department.

The IRM protocol included all specific sequences means T1 (Figure 1.A, 4, 5), T2 (Figure 1.B), FLAIR (Figure 2, 3) diffusion (Figure 6), TOF (vascular) before and after intravenous paramagnetic contrast, with axial, sagital and coronal sections, with reconstruction after the vascular sequence (Figure 7).

Results

The MRI exam demonstrated two little intracranian and extracerebral lesions, most probably meningiomas, placed on the convexity, at the level of both parietal lobes, the left one having 8,2 mm and the right one near 9,9 mm, both of them with izosignal T1 (Figure 1.A) and T2 (Figure 1.B), hipersignal in FLAIR (Figure 2, 3) and diffusion (Figure 6) and with

important and omogenous enhancement after intravenous paramagnetic contrast (Figure 4, 5, 7). The right lesion has a periferic vascularisation from caloso-marginal right artery and so the particular hemodynamic intratumoral modifications could explain the episodic aphasia. There are no edema around the tumors and no significant cortical compressive effect.

Discussions

Meningiomas are called brain tumors, although they arise from the meninges [1,2]. Most meningiomas are benign, slow-growing tumors [1,2]. Meningiomas account for about 20% of all primary brain tumors. They are most likely to be diagnosed in adults older than 60 years of age, and the incidence appears to increase with age. Meningiomas are rarely found in children [1,2]. They occur about twice as often in women as in men [2].

There are several systems used to name, or group, these tumors. One system names meningiomas by the type of cells in the tumor in syncytial (or meningothelial) meningiomas (are the most common and feature unusually plump cells), fibroblastic meningiomas (with long, thin haped cells) and transitional meningiomas (with both types of cells) [2,3]. Another system uses the terms benign, atypical, and malignant (or anaplastic) to describe the overall grade of meningiomas. In this system, benign meningiomas represent about 80% of meningiomas and contain easily recognized, well-differentiated (resembling normal) cell types which tend to grow slowly [2,3]. Atypical meningiomas represent 10-20% of them and contain proliferating cells that may be faster growing and more likely to grow back after treatment, even after seemingly complete resection [2,3]. Malignant or "anaplastic" meningiomas are quite rare (1-2% of meningiomas) and are poorly differentiated forms that often recur rapidly [2,3].

In MRI exams menigiomas appears as izosignal lesions in T1 sequence (94%) and T2 sequence (45%) with grey matter [4,5,6], with inconstant edema and high and omogenous enhancement after intravenous paramagnetic contrast [4,5,6]; a typical sign is nearest dural thickening with gross contrast enhancement - "dural tail" sign [5,6].

Researchers are studying several theories about the possible origins of meningiomas. Between 40% and 80% of meningiomas contain an abnormal chromosome 22 [7,8]. This chromosome is normally involved in suppressing tumor growth. The cause of this abnormality is not known [7,8]. Meningiomas also frequently have extra copies of the plateletderived growth factor (PDGFR) and epidermal growth factor receptors (EGFR) which may contribute to the growth of these tumors [8,9]. Previous radiation to the head, a history of breast cancer, or neurofibromatosis type 2 may be risk factors for developing meningioma. Multiple meningiomas occur in 5% to 15% of patients, particularly those with neurofibromatosis type 2. Some meningiomas have receptors that interact with the sex hormones progesterone, androgen, and less commonly, estrogen [9]. The expression of progesterone receptor is seen most often in benign meningiomas, both in men and women [8,9].

The MRI typical aspects in our case includes probably the two meningiomas in meningothelial and respective benign group . The genetic map of the patient is in study, so we can't say yet if those meningiomas are associated with chromosome 22 abnormality. Neurofibromatosis type 2 was infirmed, so our case seems to be a rare one with 2 meningiomas without type 2 neurofibromatosis. However, only an examination of a sample of tumor tissue under a microscope confirms the exact diagnosis. Such a tissue sample can only be obtained through a surgical biopsy or excision.

Our patient refused the stereotactic biopsy, so we could have only a probably diagnostic, means benign meningothelial bi-parietal little meningiomas.

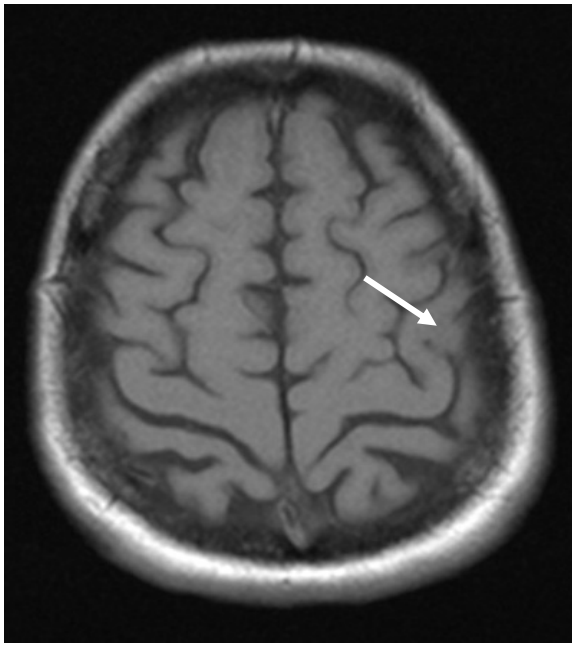


Figure 1 A

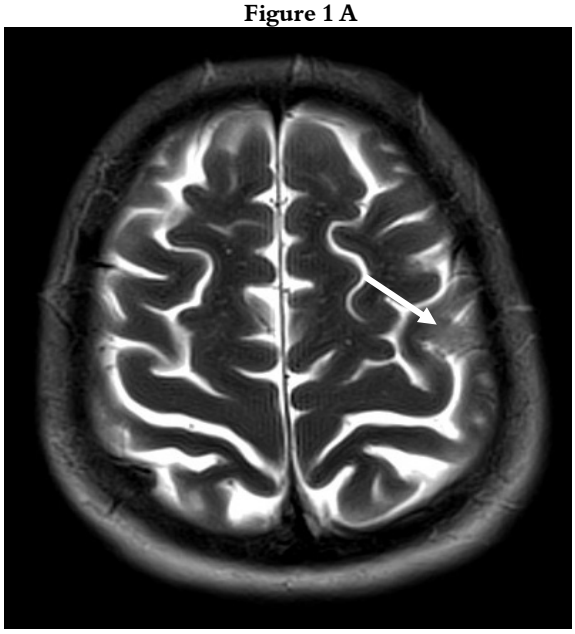


Figure 1 B

Figure 1 MRI exam – axial sections: A - T1 sequence, B – T2 sequence: Lesions with izosignal difficult to be seen

Conclusions

1. A serious neurological exam, including a complete anamnesis, suggest the most efficient neuro-imaging technique in diagnose protocol, using CT and better MRI, especial when CT result is uncertain.

2. A detailed MRI exam is very important in fixing an accurate diagnose of cerebral lesions involved in vascular stroke-like symptoms, especial in cases with no vascular risk factors and with normal CT exam;

3. Using a performance machine (minim 1 T magnetic shield) and all head MRI protocols including axial, sagital and coronal sections with thin slices, also with angiographic protocols followed by 2D or 3D reconstructions, we could obtain a precise lesion diagnostic, very important for a precocious neurosurgical treatment protocol.

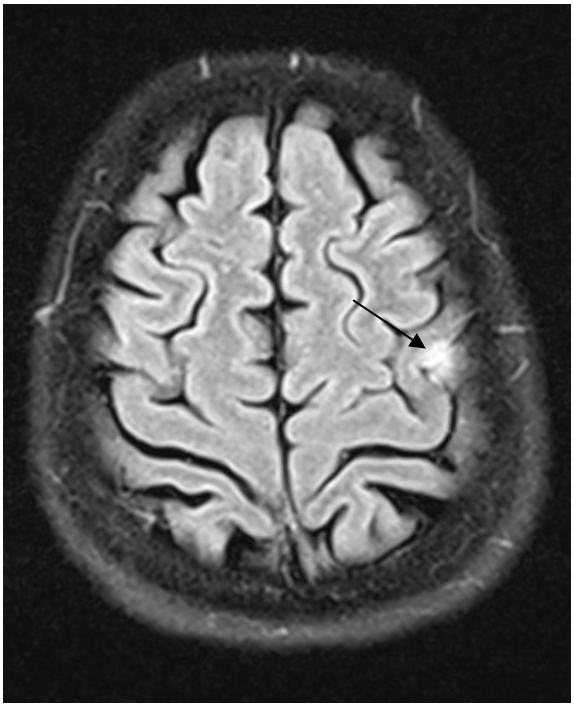


Figure 2 A

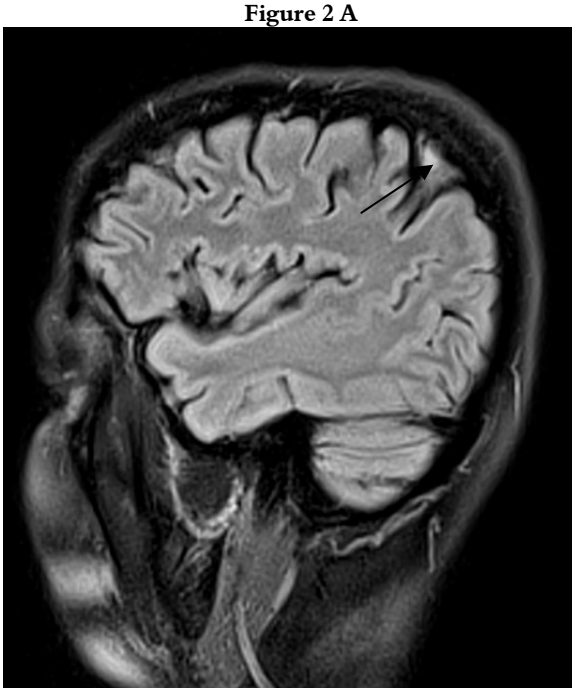


Figure 2 B

Figure 2 MRI exam – FLAIR axial (A) and sagital (B) sections: Right parietal little lesion with hipersignal

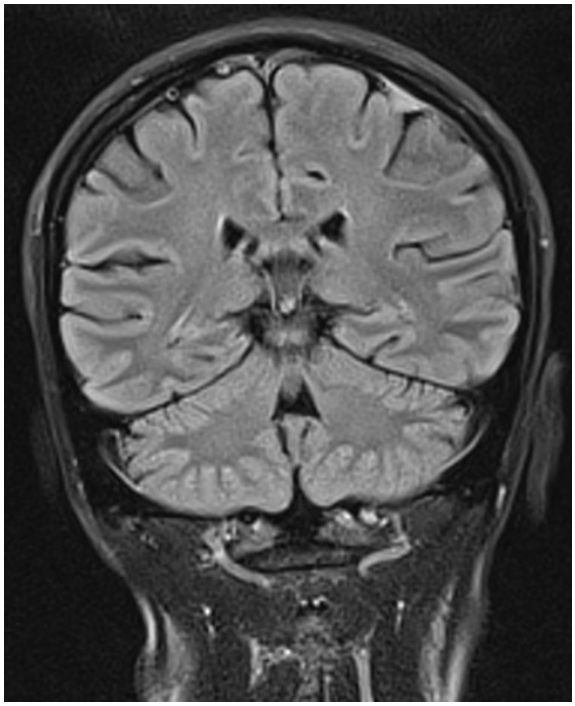


Figure 3 A

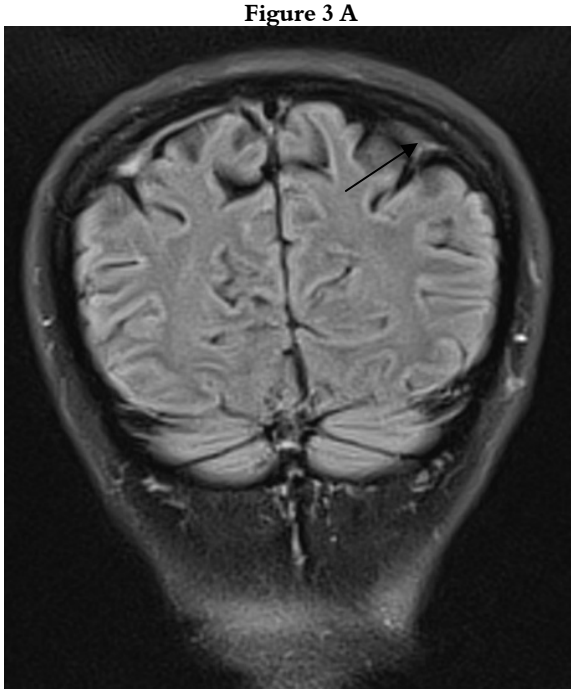
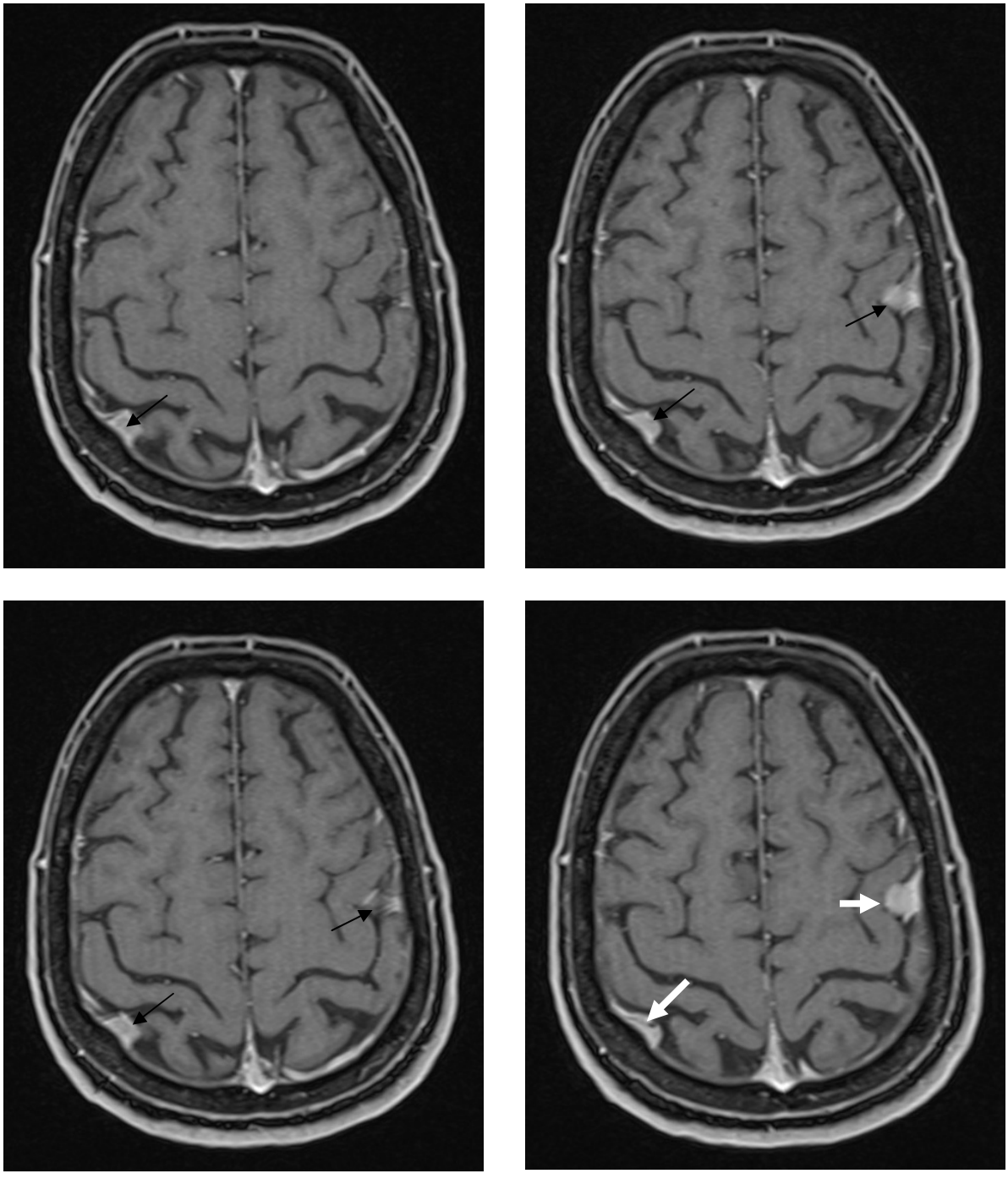
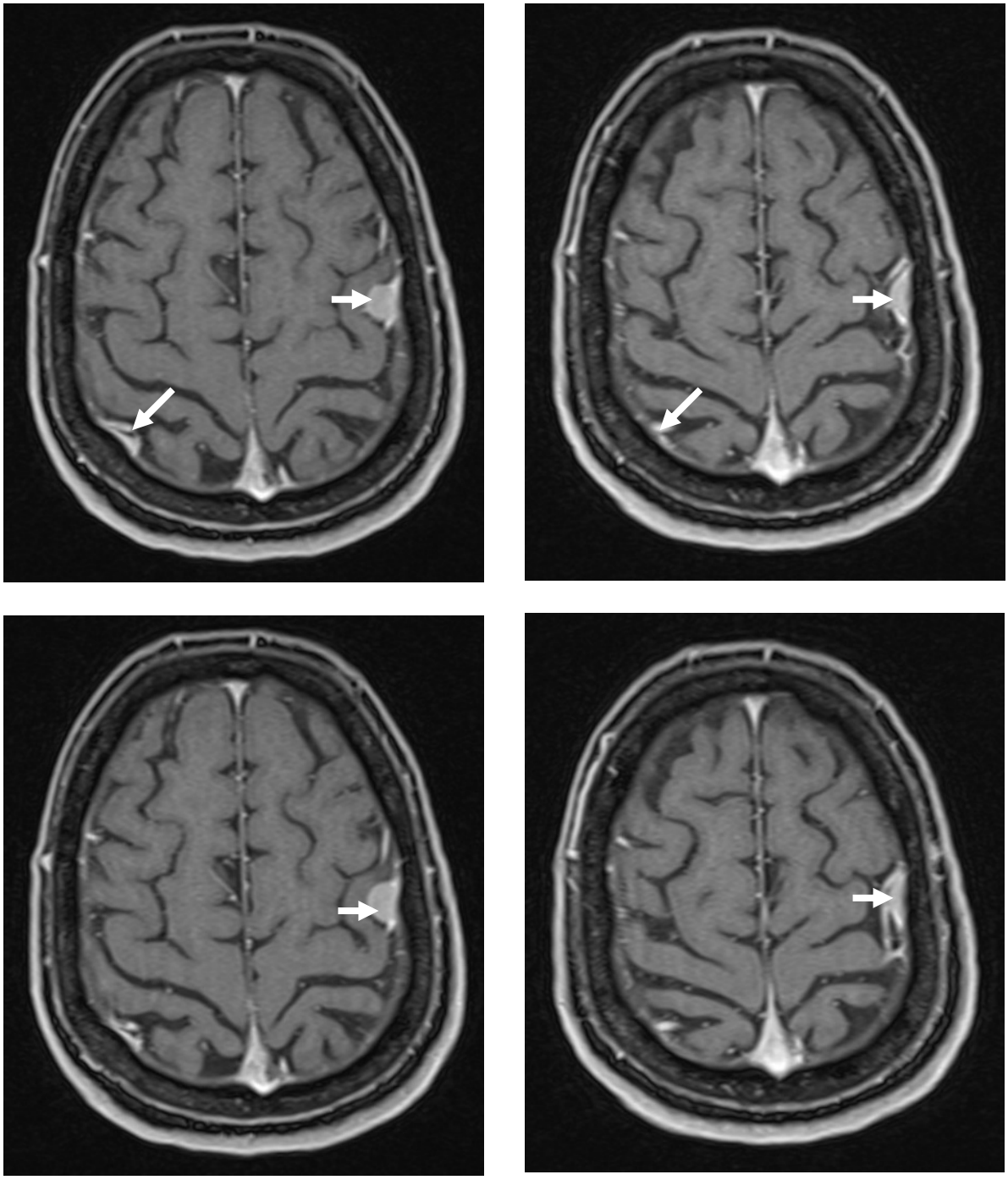


Figure 3 B

Figure 3 MRI exam – FLAIR coronal sections: Left (3.A) and right (3.B) little parietal lesions with hipersignal





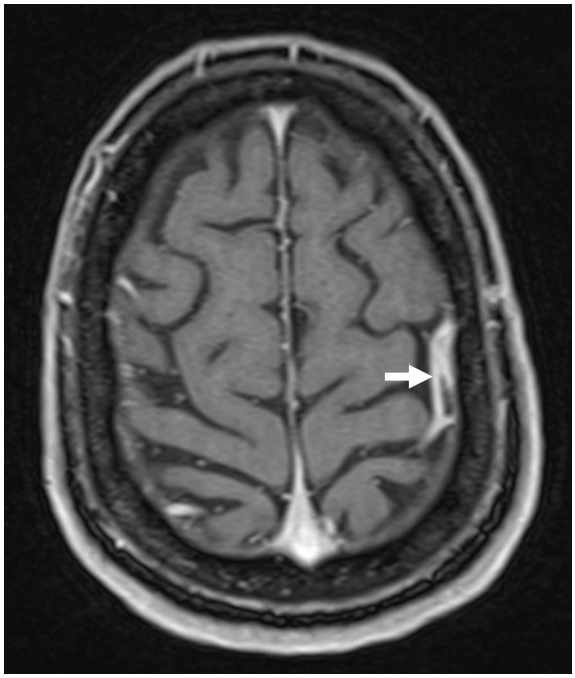


Figure 4 MRI exam – T1 axial consecutives sections post contrast:
Left and right parietal little meningiomas with hipersignal and important and omogenous enhancement after intravenous paramagnetic contrast

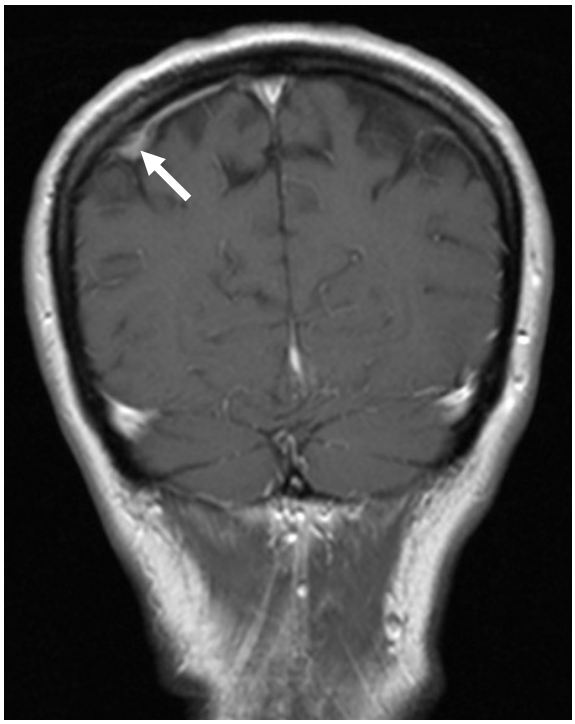
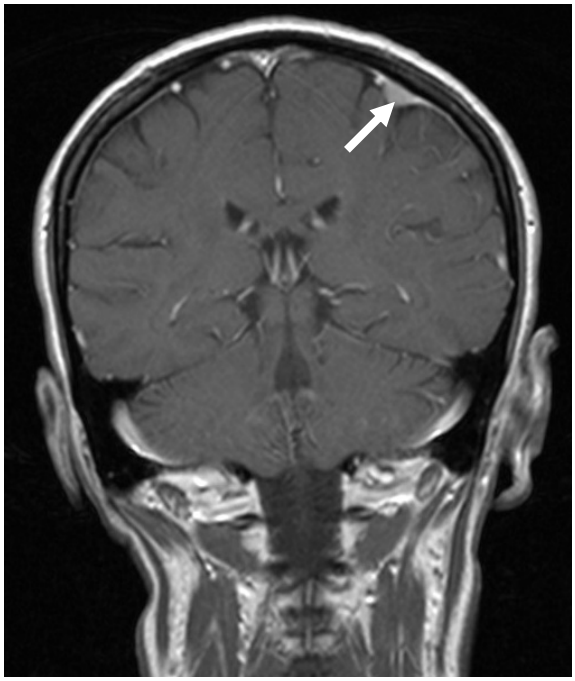
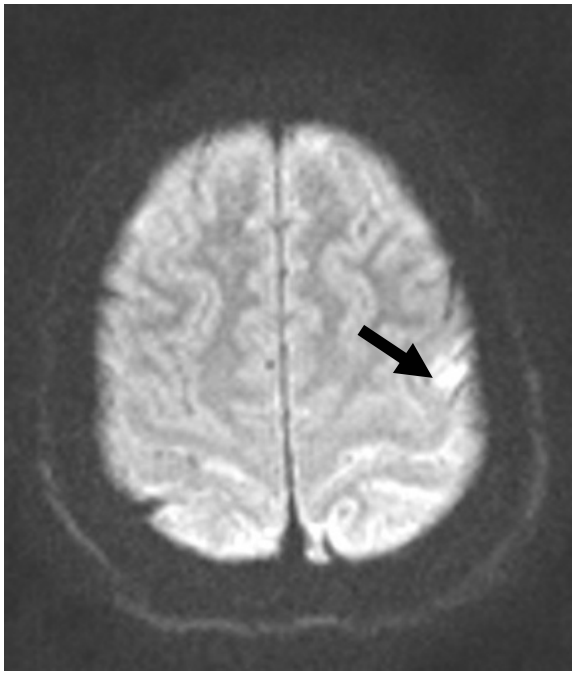


Figure 5 MRI exam – T1 coronal consecutives sections post contrast:
Left and right parietal little meningiomas with important and omogenous enhancement after intravenous paramagnetic contrast





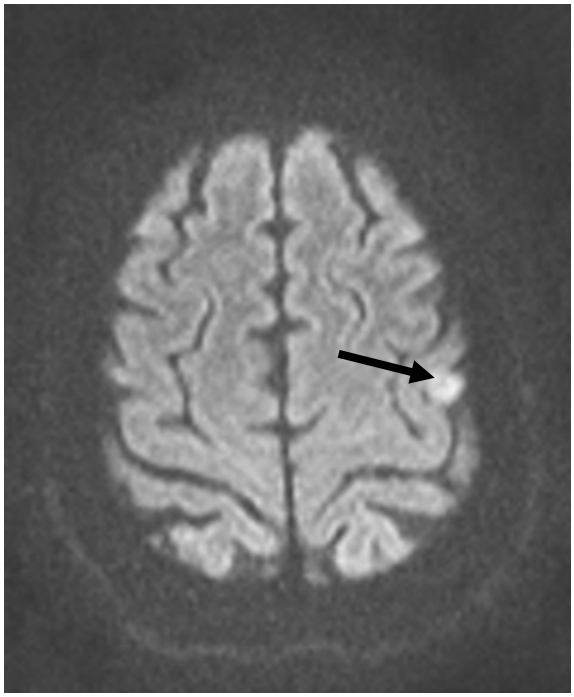


Figure 6 MRI exam – diffusion axial sections pre-contrast:
Left parietal little meningioma with hipersignal

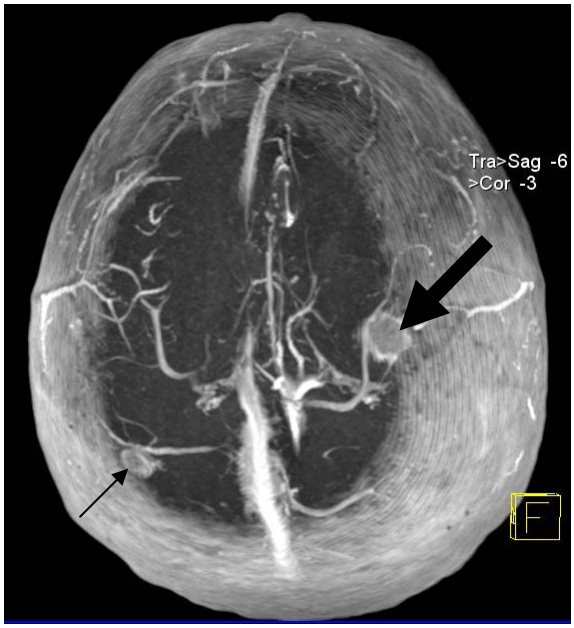


Figure 7 MRI exam – angiography 3D reconstruction:
Left and right (small) parietal little meningiomas with their capsular vessels

References

1. Kim NR et al: Childhood meningiomas associated with meningioangiomatosis: report of five cases and literature review. Neuropath Applied Neurobiol, 28: 48-56, 2002.
2. Scroop R et al: Meningioangiomatosis. Australian Radiology, 44: 460-63, 2000.
3. Park MS et al: Multifocal meningioangiomatosis: a report of two cases. A]NR, 20: 677-80, 1999.
4. Alvernia JE et al: Preoperative neuroimaging findings as a predictor of the surgical plane of cleavage: prospective study of 100 consecutive cases of intracranial meningioma. J Neurosurg. 100:422-30, 2004.
5. Takeguchi T et al: The dural tail of intracranial meningiomas on fluid-attenuated inversion-recovery images. Neuroradio146:130-5, 2004.
6. Yang S et al: Dynamic contrast-enhanced perfusion MR imaging measurements of endothelial permeability: differentiation between atypical and typical meningiomas. AJNRAm J Neuroradiol. 24(8):1554-9, 2003.
7. Lopez-Gines C et al: Association of loss of 1p and alterations of chromo sones 14 in meningioma progression Cancer Genet cytogenet. 148:127-8, 2004.
8. Dezamis E et al: The molecular genetics of meningiomas and genotypic/phenotypic correlations. Rev Neurol (Paris).159(8-9):727-38,2003.
9. Korshunov A et al: DNA topoisomerase II-alpha and cyclin A immunoexpression in meningiomas and its prognostic significance: an analysis of 263 cases. Arch Pathol Lab Med. 126(9):1079-86, 2002.