An unusual case of asymptomatic meningioma of the falx cerebri detected with 99mTc-HDP bone scintigraphy

Published on 03.07.2006

DOI: 10.1594/EURORAD/CASE.4926
ISSN: 1563-4086
Section: Neuroradiology
Case Type: Clinical Cases
Authors: Marco Di Girolamo, Valerio Arcangelo Vitale, Tiziana Lanzolla, Maurizio Nicolini, Calogero D'Alessandria
Patient: 79 years, female

Clinical History:

A 79 year old female submitted to total body bone scintigraphy due to previous breast cancer.

Imaging Findings:

A 79 year old, female, underwent bone scintigraphy to detect metastases in follow-up program after a breast cancer diagnosed 2 years before. Six months before the patient had a right anterior shoulder luxation. The $^{99m}$Tc-Phosphonate ($^{99m}$Tc-HDP: 740 MBq) detected two captation areas, one located in the right shoulder and the other one in the convexity of the skull. The patient did not have any neurological symptoms and was submitted to brain MRI which detected a pedunculated mass with implantation on the falx and compressing the mesial portion of the right superior frontal gyrus.

Discussion:

Meningioma is a benign tumour originating from the meningotheelial cells of the arachnoid membrane or from the arachnoid granulations. Meningiomas could be found in the skull, in the spinal canal, in the choroid plexus and in the arachnoid around cranial nerves. Most meningiomas appears as round mass with broad implantation on dura mater. They are not invasive, and characterized by a well defined interface between the tumor and the brain. Meningiomas are typically highly vascularized and classically accompanied by hyperostosis, more rarely by bony erosion. The hyperostosis is probably due to osteoblastic activity, but the medullary spaces of the overlying bone often are filled with tumor cells. This tumor accounts for about one fifth of all CNS primary tumours, with a peak incidence in the fifth and sixth decades, more frequently appearing in females (M:F=1:2). Multiple meningiomas are seen in 1 to 9% of MR studies detecting this pathology and can be associated with neurofibromatosis type II. The most frequent location of meningiomas are the convexity, overlying the cerebral hemispheres, the falx, in a parasagittal site or the inferior wing of the sphenoid. On MRI, meningiomas are typically isointense to cortical grey matter both on T1 and T2 weighted spin-echo sequences. On T1 weighted images, it is known that meningiomas are almost always isointense to grey matter (94%). A minority of the lesions are hypo- or hyperintense. On T2 weighted spin-echo images, however about 45% of the lesions are relatively isointense. 44% of the lesions are hyperintense to grey matter with about 5% demonstrating very high tumor intensity. Only 10% of the lesions are hypo-intense. In our case we accidentally found a captation area during a bone scintigraphy performed with $^{99m}$Tc-phosphonate to evaluate bone metastases, secondary to breast cancer. A captation of radio tracer in the extraosseous tissue is yet unexplained but the major mechanism reported are linked to an increased vascularity, capillary permeability, cellular
abnormality in calcium metabolism, abnormality in binding of 99mTc phosphate complexes to phosphate enzymes, and binding of 99mTc phosphate to immature collagen. Calcification in necrotic tissue could also captnate this radiotracer. Concerning the meningioma captation of the radiotracer, the more reliable explanation is the high vascularization of this lesion. In fact, in the scientific literature are reported incidental detection of falx meningioma not only on 99mTc-phosphonate scintigraphy but also on post-therapy radioiodide whole-body imaging. In our study the parasagittal meningioma was detected both in the blood-pool phase and in the osteo-metabolic phase of the bone scintigraphy. Only considering bone scintigraphy, a differential diagnosis can be difficult between meningiomas and dural metastases or peripheral intra-axial cerebral metastases. On MRI differential diagnoses includes hemangiopericytoma, hemangioma and fibrous tumor. A differentiation from schwannoma has to be considerted in meningiomas located in the cerebellopontine angle, very rare to find. (The authors thank the Neurologic Centre of Latium, where the MR examination was performed)

**Differential Diagnosis List:** Meningioma of the falx cerebri

**Final Diagnosis:** Meningioma of the falx cerebri

**References:**


Description: Bone scintigraphy with 99mTc-HDP (740 MBq) during blood-pool phase (A), and during osteo-metabolic phase in anterior(B), right lateral (C), and left lateral scans (D). Both on blood-pool and osteometabolic phases it is possible to appreciate accumulation of the radiotracer of the parasagittal meningioma. Origin:
Figure 2

Description: Brain MRI performed with axial TSE T2-weighted scan (A), coronal FLAIR acquisition (B), and axial and coronal contrast-enhanced TSE T1-weighted scans (C and D) showing a meningioma of the falx cerebri compressing the right superior frontal gyrus. Origin: