

Central Nervous System Lesion Differentiation in the Emergency Radiology Department

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Abstract : An 89 years old woman came to the emergency department complaining of long-lasting headaches and nausea. A CT examination was performed, and a homogeneous midline anterior cranial fossa lesion was revealed, which was situated near the base and measured 2,4 cm in diameter. The patient was allergic, and an i.v.c injection could not be done on the spot, and neither could an MRI exam because of metallic implants. How could someone narrow down the differential diagnosis? The interhemispheric meningioma is usually a silent midline lesion with no edema, and most often presents as a homogeneous, solid type, isodense, or slightly hyperdense mass (usually the smallest lesions as this one). Of them, 20-30% have some calcifications. Hyperostosis is typical for meningiomas that abut the base of the skull but is absent in the current case, presumably of a more cephalad location that is borderline away from the bone. Because further investigation could not be done, as the patient was allergic to the contrast media, some other differential options should be considered. Regarding the site of the lesion, the most common other entities to keep in mind are the following: Metastasis, tumor of skull base, abscess, primary brain tumors, meningioma, giant aneurysm of the anterior cerebral artery, olfactory neuroblastoma, interhemispheric meningioma, giant aneurysm of the anterior cerebral artery, midline lesion. Appearance will depend on whether the aneurysm is non-thrombosed, or partially, or completely thrombosed. Non-contrast: slightly hyperdense, well-defined round extra-axial mass, may demonstrate a peripheral calcified rim, olfactory neuroblastoma, midline lesion. The mass is of soft tissue attenuation and is relatively homogeneous. Focal calcifications are occasionally present. When an intracranial extension is present, peritumoral cysts between it and the overlying brain are often present. Final diagnosis interhemispheric meningioma (Known from the previous patient's history). Meningiomas come from the meningocytes or the arachnoid cells of the meninges. They are usually found incidentally, have an indolent course, and their most common location is extra-axial, parasagittal, and supratentorial. Other locations include the sphenoid ridge, olfactory groove, juxtaseilar, infratentorial, intraventricular, pineal gland area, and optic nerve meningioma. They are clinically silent entities, except for large ones, which can present with headaches, changes in personality status, paresis, or symptomatology according to their specific site and may cause edema of the surrounding brain tissue. Imaging findings include the presence of calcifications, the CSF cleft sign, hyperostosis of adjacent bone, dural tail, and white matter buckling sign. After i.v.c. injection, they enhance brightly and homogeneously, except for large ones, which may exhibit necrotic areas or may be heavily calcified. Malignant or cystic variants demonstrate more heterogeneity and less intense enhancement. Sometimes, it is inevitable that the needed CT protocol cannot be performed, especially in the emergency department. In these cases, the radiologist must focus on the characteristic imaging features of the unenhanced lesion, as well as in previous examinations or a known lesion history, in order to come to the right report conclusion.

Keywords : computed tomography, emergency radiology, metastasis, tumor of skull base, abscess, primary brain tumors, meningioma, giant aneurysm of the anterior cerebral artery, olfactory neuroblastoma, interhemispheric meningioma

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