CEREBRAL ASTROBLASTOMA RESEMBLING AN EXTRA-AXIAL NEOPLASM

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SUMMARY

A case of a cerebral astroblastoma is described in which MR imaging findings suggested the diagnosis of an extra-axial neoplasm. The lesion was proven to be intracerebral both surgically and histopathologically. Calvarial erosion, and buckling of the cerebral cortex by a peripherally located well circumscribed, highly enhancing mass, were the main MR findings leading to an erroneous preoperative diagnosis of an extra-axial mass. An astroblastoma should be included to the differential diagnosis of a superficially located tumor presenting with the findings of an extra-axial mass, especially in a young patient.

Key-words : Brain, MR studies. Brain neoplasms, MR. Astroblastoma.

INTRODUCTION

Astroblastoma is a rare neoplasm of glial origin, representing 0.45% of gliomas. The tumor, when located superficially, can closely resemble an extra-axial neoplasm, mainly a meningioma [1, 2, 5]. We describe a case of astroblastoma, proven to be intracerebral both surgically and histopathologically, in which MR imaging findings suggested the diagnosis of an extra-axial neoplasm.

CASE REPORT

A 6-year-old girl presented with a 10 days history of headaches, diplopia, nausea and vomiting. Bilateral papilloedema was noted on a neurological examination. A computed tomography (CT) scan of the brain showed an approximately 3.5 × 3.5 cm left parieto-occipital mass with mild edema in the centrum semiovale. It showed an inhomogenous enhancement on postcontrast CT images. The posterior border seemed to have a broad-based continuity with the dura. MR imaging with spin-echo sequences at 0.5 T showed hypointensity on T1-weighted, and hyperintensity on proton-density and T2-weighted images (fig. 1a, b). Lobulation of the tumor posteriorly, and corresponding focal erosion of the calvarium was best appreciated on postcontrast axial and sagittal MR images (fig. 1c, d), which, together with buckling of the cerebral cortex, suggested a dural-based lesion.

A parieto-occipital craniectomy was performed. The calvarium was very thin and the dura was streched tightly over the mass. The tumor was resected totally, and was found macroscopically to be located under the intact arachnoid. Microscopically, the tumor showed a cellular arrangement around the blood vessels forming pseudorosettes with their bodies directed toward the
FIG. 1a-d. – Astroblastoma resembling an extra-axial neoplasm.

The mass is hypointense on T1-weighted (a) and hyperintense on T2-weighted (b) spin-echo MR images. Postcontrast T1-weighted axial and sagittal images (c, d) demonstrate inhomogenous enhancement. Unenhanced portions including a cleft like area in front of the tumor histopathologically correlated with intratumoral cysts. Posterior lobulation of the mass erodes the calvarium locally, and there is buckling of the parietal cortex anterolaterally (a-d), suggesting an extra-axial location.

vessel walls. Mitotic figures were not seen. These findings as well as tumor as staining with phosphotungstic acid-hematoxylin were histopathologically considered to be in favor of an astroblastoma (fig. 2).

DISCUSSION

Astroblastoma is a rare tumor of glial origin that is frequently seen in children, adolescents, and young adults. This variant of astroglial tumor is usually located superficially in the cerebral cortex and subcortical areas. The tumor may invade the subarachnoid space, leptomeninges and dura [1, 2, 5].

Radiological appearances reported on relatively limited subjects cover a solid, isodense mass with
marked homogenous or inhomogenous enhancement on CT. These solid portions are usually hypointense on T1-weighted and hyperintense on T2-weighted spin-echo MR images. Intratumoral cyst, if present, reveals a signal intensity pattern of cerebrospinal fluid. MR demonstrates better internal tissue characterization and relationships of the mass with surrounding structures. A recent report dealt with proton MR spectroscopy of an astroblastoma using one-dimensional proton chemical shift imaging, which displayed an increased choline-to-phosphocreatine/creatine ratio, decreased N-acetyl aspartate, increased lactate/lipid, and increased myo-inositol in voxels containing primarily solid tumor, as compared with normal brain [1]. All these findings, however, are not specific for the diagnosis of astroblastoma [1, 2, 5].

The CT appearance in our case was a rather ill-defined parieto-occipital mass on precontrast scans with inhomogenous moderate contrast uptake. Although the density of the mass was suggestive of a glial tumor, peripheral localisation and its dorsal margin touching the inner surface of the skull raised the suspicion of an extra-axial origin. On MR imaging, posterior tumoral lobulation eroding the inner table and diploe as well as buckling of the parietal cortex anterolaterally were considered a strong evidence of an extraparenchymal tumor. An intense contrast-enhancement pattern on MR imaging was nonspecific for the differentiation of the origin of the tumor. Hypointensity on T1-weighted MR images, and hyperintensity on T2-weighted images, generally seen in gliomas, can also be the signal intensity pattern encountered in meningiomas composed predominantly of syncytial or angioblastic elements [4]. Besides, dural involvement, not present in our case, may be encountered in astroblastomas, as well [1, 2].

Astrogial tumors such as a pilocytic astrocytoma, glioblastoma, pleomorphic xantoastrocytoma and an astroblastoma, when located superficially, can closely resemble an extracranial neoplasm, mainly a meningioma. This is also true for a dyssembryoplastic neuroepithelial tumor, which consistently shows a superficial location [3]. Contrarily, features of an intracerebral mass can be seen in meningiomas. It is apparent that distinction in such cases may cause diagnostic difficulties even most of the criteria match to an extracerebral tumor on MR [1, 4, 6].

In conclusion, an astroblastoma should be included in the differential diagnosis of a superficially located tumor presenting with the MR findings of an extra-axial mass, especially in a young patient.

RÉFÉRENCES