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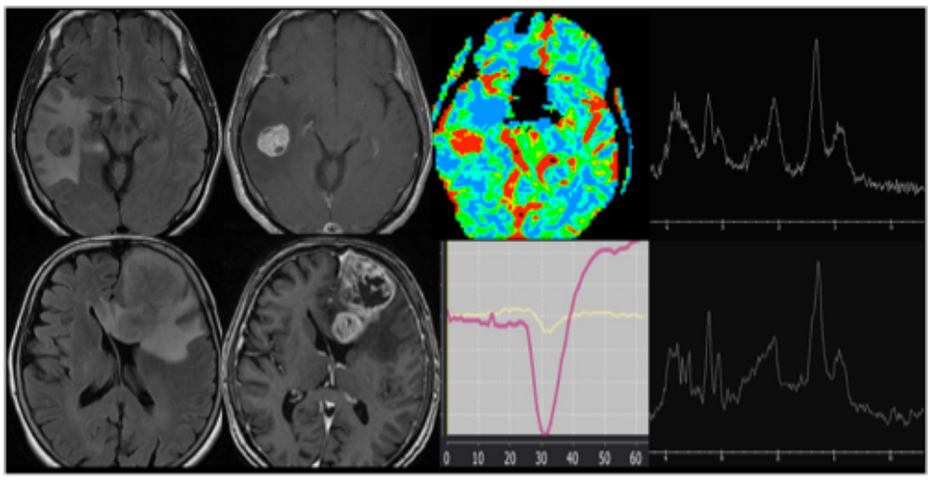
Leclercq D, Mokhtari K., Galanaud D., Nouet A., Roedel B., Chiras J., Martin-Duverneuil N.: **Primary Gliosarcomas: Multimodal MR Imaging Findings**

PURPOSE: Primary gliosarcoma (PG) is a rare malignant brain tumor presenting both glial and mesenchymal components. Prognosis is at least as poor as glioblastoma's. Imaging appearance with conventional MR imaging (MRI) is variable and can be indistinguishable from glioblastoma. Recent literature reported two different types of PG with different prognosis: one mimicking the appearance of a meningioma, and one resembling glioblastoma. Primary gliosarcomas features have not been reported with combined multimodal including perfusion and spectroscopy. The purpose of this presentation is: 1. to present the MRI aspects of pathologically confirmed PG with conventional MRI, spectroscopy and perfusion. 2. Determine whether perfusion and spectroscopy can help distinguish PG from glioblastomas.

CASE REPORT: We retrospectively reviewed the MRI findings, clinical information and pathology reports of four patients presenting with PG between 2005 and 2010 in our institution. All patients had a multimodal MRI protocol including at least T2-weighted images, FLAIR images, T1-weighted images with and without gadolinium injection, diffusion images, MR perfusion and spectroscopy (TE: 35ms-144ms). Eleven patients with glioblastoma studied during the same period with the same MRI protocol were used as a control population.The Perfscape software (Olea Medical™, La Ciotat, France) was used to determine maximal rCBV (relative cerebral blood volume), KTrans and rCBF.

IMAGING FINDINGS: Patients were three male and one female. Average age at diagnosis was 59 years, ranging from 48 to 75 year. Three lesions were supratentorial (one frontal and two temporal) and one lesion was cerebellar. Lesion sizes ranged from 26mm to 64mm (average 44mm). Two patients presented with a predominantly tissular mass, while the other two patients presented with a mostly necrotic tumor resembling glioblastoma with adjacent dural thickening. Macroscopic peripheral vessels were observed in two patients on conventional sequences. Findings on diffusion imaging were unremarkable. Spectroscopy sequences showed a profile of high-grade tumor, with elevated choline, decreased NAA and presence of a large resonance of lipids and lactate. In perfusion sequences, maximal rCBV values were higher than those observed in gliosarcomas. The mean maximal rCBV value was 10.2 in PG patients, as compared to 2.96 in glioblastoma patients ($p < 0.001$).



SUMMARY: We present the first reported results of multimodal MRI in primary gliosarcomas in four patients. We confirm the two different subtypes of this tumor: predominantly solid or heterogeneous necrotic masses with dural invasion. Spectroscopy results were similar to those of glioblastomas. Gliosarcomas always appeared hypervascular with higher perfusion values than glioblastomas.

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