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FLAIR pseudoprogression in patients with anaplastic oligodendrogliomas treated with PCV chemotherapy alone

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Abstract

Background: Pseudoprogression in gliomas has been extensively described after radiotherapy with or without chemotherapy, but not after chemotherapy alone. Herein, we describe the occurrence of pseudoprogression in patients with anaplastic oligodendrogliomas treated with post-operative procarbazine, lomustine and vincristine (PCV) chemotherapy alone.

Methods: We retrospectively reviewed the medical and radiological files of patients with 1p/19q codeleted, IDH-mutant anaplastic oligodendrogliomas treated with PCV chemotherapy alone who presented MRI modifications suggestive of tumour progression and in whom the final diagnosis was a pseudoprogression.

Results: We identified 6 patients. All patients underwent a surgical resection and were treated with PCV chemotherapy without radiotherapy. After a median of 11 months following the initiation of chemotherapy (range: 3-49 months), the patients developed asymptomatic white matter MRI modifications around the surgical cavity leading to the suspicion of a tumour progression. These modifications appeared as hyperintense on FLAIR sequence, hypointense on T1 sequence, and lacked mass effect (0/6), contrast enhancement (0/6), restriction on diffusion weighted-imaging (0/4), rCBV increase on perfusion MRI (0/4), and hypermetabolism on ^{18}F-DOPA PET scan (0/3). One patient underwent a surgical resection demonstrating no tumour recurrence; the five other patients were considered as having post-therapeutic modifications based on imaging characteristics. After a median follow-up of 4 years, all patients were progression-free.

Conclusion: Anaplastic oligodendroglioma patients treated with post-operative PCV chemotherapy alone occasionally develop T2/FLAIR hyperintensities around the surgical cavity that can wrongly suggest tumour progression. Multimodal imaging and close follow-up should be considered in this situation.

Keywords: Anaplastic oligodendroglioma; Glioma; PCV chemotherapy; Pseudoprogression; Radiotherapy.