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Glioblastoma simultaneously present with adjacent meningioma: case report and review of the literature.

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The simultaneous occurrence of multiple primary intracranial tumors has been reported previously. However, most of these tumors arise after cranial radiotherapy or in association with familial tumor syndromes. Double tumors of different histologies that are unrelated to radiotherapy or genetic disorders are very rare. We present a case of two primary intracranial tumors occurring simultaneously at adjacent sites. Preoperative gadolinium-enhanced magnetic resonance imaging of these tumors revealed a single continuous lesion. Postoperative histological examination revealed the presence of two distinct tumors, meningioma and glioblastoma multiforme. To elucidate the mechanism of synchronous tumor formation, we performed immunohistochemical analysis of the proteins involved in the receptor tyrosine kinase, Wnt, and Notch signaling pathways. These analyses showed that platelet-derived growth factor (PDGF) receptors-alpha and beta were overexpressed in both tumors, thereby indicating the oncogenic effects of activated signaling of these receptors. The PDGF-mediated paracrine system may induce one tumor from another.

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