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Letter to the Editor

Intra-tumoral hemorrhage: A potential problem for all types and grades of intracranial neoplasms

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Dear Sir,

The paper by Carrasco *et al.*, detailing a case of sudden deterioration in a 47-year-old male who was found to have a colloid cyst of the third ventricle with biventricular hydrocephalus, draws attention to the significance of spontaneous hemorrhage within central nervous system tumors.[3] Sudden death in colloid cysts may occur at any age most often due to acute hydrocephalus, venous infarction, or hypothalamic effects;[2,3] however, as the authors have demonstrated, spontaneous hemorrhage may also rarely occur. The results of this event may be similar to other cerebral tumors with intraparenchymal hemorrhage, with sudden expansion of the tumor mass causing compression of adjacent brain centers, herniation, and midline shift. The etiology of this type of cerebral hemorrhage is, however, unclear. While rupture of proliferating vessels within rapidly growing malignancies with areas of necrosis, such as glioblastomas and medulloblastomas, is not difficult to understand, hemorrhage may also complicate quite indolent lesions such as low-grade optic chiasm astrocytomas.[1] Presumably, the latter hemorrhage is due to leakage from fragile neovasculature, although the reasons for this occurring in a specific tumor may not be determinable or predictable. The brain is, therefore, vulnerable to the effects of intraparenchymal hemorrhage within a wide range of space-occupying lesions, including histologically low-grade lesions such as colloid cysts or well-differentiated astrocytomas, which may initiate rapid clinical deterioration culminating in death. As has been clearly demonstrated in the report by Carrasco *et al.*,[3] there may be no such an entity as a "benign" intracranial tumor.

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Author reply

Dear Sir,

We have read carefully this letter to editor that provides some interesting thoughts on the topic of spontaneous intracranial bleeding in association with brain tumors. This phenomenon has an estimated prevalence of 1.4–14.6% of patients harboring intracranial neoplasms, although the apparition of clinical symptoms can be directly related to the stroke in up to 57% of these patients.[2] Therefore, tumoral hemorrhage may remain clinically silent, being consigned to a radiological and/or pathological finding. The presence and severity of clinical symptoms may depend on several factors: the size and topography of the neoplasm, the volume of hemorrhage, the repetition of hemorrhagic events, and the location of the bleeding.

Among the patients presenting a hemorrhagic brain tumor, three patterns of bleeding can be distinguished: 1) pure intra-tumoral, 2) extra-tumoral (as a leakage from a primary intra-tumoral bleed), and 3) pure extra-tumoral.[1] The origin of a pure intra-tumoral hemorrhage in a malignant brain tumor can be considered a consequence of its aggressive histological properties, while the mechanism producing spontaneous bleeding within a benign tumor remains unclear.[4] Personal antecedents predisposing to hemorrhage, such as iatrogenic or pathologic coagulopathy, systemic hypertension, and drug abuse, may play a role.[3] Pure extra-tumoral bleeding in contiguity to the neoplasm has been considered a consequence of the lesion of normal surrounding vessels during tumoral growth.[4] Finally, diffuse extra-tumoral bleeding, such as in subarachnoid hemorrhage and parenchymal clots appearing distant from the neoplasm, has been related to acute intracranial hypertension.[1]

Our paper deals with a clinical case presenting unusual features that make it a unique report: Acute intra-tumoral bleeding with extra-tumoral spreading in an otherwise benign intraventricular tumor, coexisting with a distant extra-tumoral hematoma. These rare events were followed by severe clinical symptoms as a consequence of the development of acute hydrocephalus and compression of vital structures located near the ventricular boundaries. Therefore, the malignancy of brain tumors seems not to depend only on its histological characteristics; the intracranial location of the neoplasm may also put the patient at risk for a "malignant" clinical course.

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