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CASE REPORT

Glioblastoma multiforme presenting with ischemic stroke: Case report and review of the literature

Glioblastome multiforme responsable d'un AVC ischémique : à propos d'un cas et revue de la littérature

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KEYWORDS

Glioblastoma multiforme;
Brain tumor;
Ischemic stroke

Summary A 58-year-old woman presented with acute onset of global aphasia. Imaging studies revealed a left frontotemporal enhancing tumor and ischemic stroke in the territory of the middle cerebral artery. The patient was operated on, and the diagnosis of glioblastoma multiforme was confirmed. At the time of surgery, several branches of the left middle cerebral artery were found embedded in the tumor. One branch, which was infiltrated by tumor and completely occluded, was resected to achieve complete resection. Postoperatively, the stroke area within the middle cerebral artery territory increased, together with worsening of the patient's clinical status, thus requiring urgent decompressive craniectomy. Thereafter, the patient gradually improved, and received radiation therapy and chemotherapy with no recurrence after 24 months of follow-up. To our knowledge, glioblastomas presenting with ischemic stroke are rare, and such patients should be considered to be at high surgical risk.

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Introduction

Glioblastoma multiforme is the most frequent and most aggressive primary brain tumor. Common presenting symptoms include seizures and focal neurological deficits due to direct brain infiltration and/or mass effects, together with surrounding edema. Glioblastomas occasionally present

with intracranial hemorrhage, but are rarely associated with cerebral infarction. This is a report of a patient who presented with acute onset of aphasia secondary to ischemic stroke as the initial manifestation of a glioblastoma.

Case report

A 58-year-old woman was admitted to the emergency room with acute onset of global aphasia. Magnetic resonance imaging (MRI) revealed a large cystic lesion, with a characteristic ring-like enhancement, in the left frontotemporal region associated with surrounding edema and a slight

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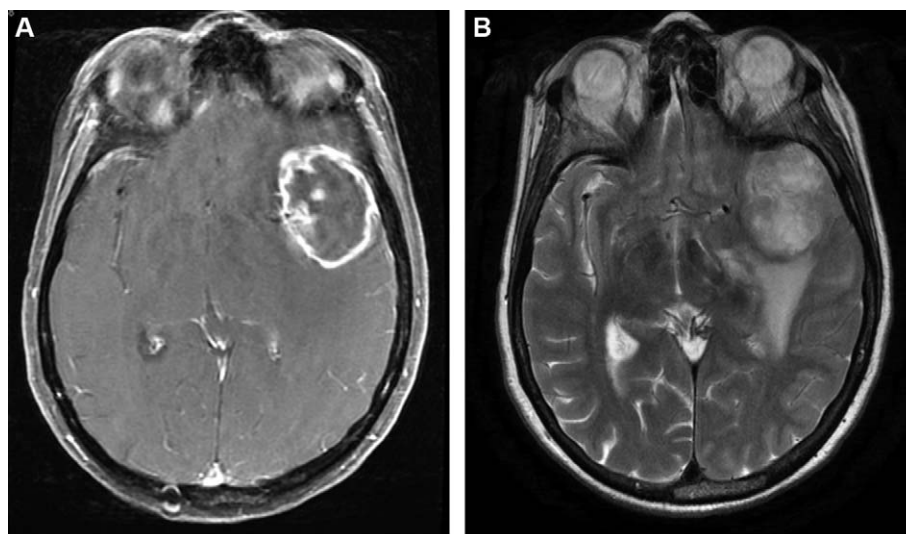


Figure 1 MRI [T1-weighted, post-gadolinium (A) and T2-weighted (B)] demonstrates a large cystic lesion in the left frontotemporal region, with typical ring-like enhancement suggestive of malignant brain tumor.

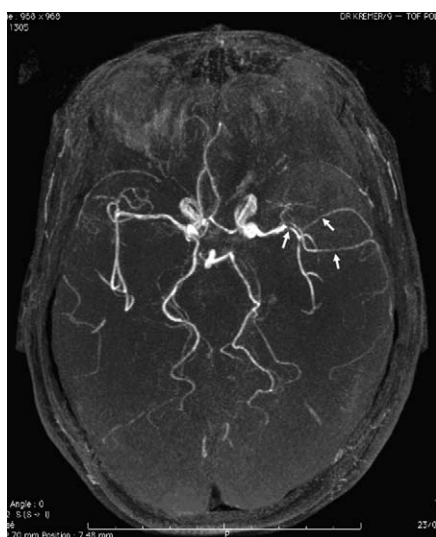


Figure 2 Preoperative three-dimensional time of flight (TOF) MR angiography reveals the involvement of several branches of the left middle cerebral artery (MCA). Note the irregularity of those arteries (white arrow).

midline shift (Fig. 1A and B). This was highly suggestive of a high-grade tumor, and also showed tumor encasement of several branches of the left middle cerebral artery (Fig. 2). Diffusion-weighted MRI identified an ischemic stroke in the frontal part of the middle cerebral artery territory (Fig. 3A and B). The patient had no cerebrovascular risk factors, and the results of the laboratory and cardiovascular workups were normal.

The patient underwent tumor resection. At the time of surgery, several M3 branches of the left middle cerebral artery were found embedded within the tumor. One branch, which could not be separated from the tumor and was completely occluded, was resected to achieve complete resection. Postoperatively, the patient awoke with a worsened neurological status. Her global aphasia was com-

plete, and she presented with severe right hemiparesis. Over the next few hours, her level of consciousness gradually decreased. The computed tomography (CT) scan demonstrated no hemorrhage, but there was a large region of hypodensity posterior to the resection cavity and a significant midline shift. Diffusion-weighted MRI confirmed enlargement of the stroke area within the middle cerebral artery territory (Fig. 4), prompting urgent left decompressive craniotomy. The patient progressively recovered and was sent to a rehabilitation center. At 3 months postoperatively, she was still complaining of weakness in her right arm, but she was able to walk. The aphasia had improved significantly. Pathological examination confirmed the diagnosis of glioblastoma. The patient was treated according to the Stupp protocol [1] as follows: temozolomide with concomitant radiotherapy, followed by 6-monthly temozolomide. There was no recurrence at follow-up 24 months later.

Discussion

In the present case, the hypothesis of glioblastoma causing ischemic stroke was supported by the sudden onset of clinical symptoms together with the typical features of stroke on diffusion-weighted MRI, and the surgically confirmed infiltration and occlusion of branches of the left middle cerebral artery. Occasionally, malignant brain tumors present with intracranial hemorrhage, and result in the acute onset of neurological symptoms mimicking hemorrhagic stroke [2]. On the other hand, ischemic strokes attributable to brain tumors are rare, and are more often related to benign tumors, such as meningiomas, that cause progressive vascular encasement and compression of intracranial vessels. To our knowledge, there are only a few reports of glioblastoma presenting with stroke [3].

Given the underlying mechanisms of tumor-related cerebral infarction, most of the available articles in the literature have attributed this to direct infiltration or dissection of the major cerebral arteries [3,4]. Indeed, several reports have shown that glioma cells are able to invade

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