Intracranial Meningioma Manifesting As Transient Ischemic Attack

L C Meguins, G B Sampaio, E C Abib, R F El Hossain Ellakkis, M A Teixeira, S R Martucci J, R A Rocha da Cruz Adry, D F de Morais

INTRODUCTION

Meningiomas are neoplasms of meningothelial cells of the arachnoid layer (1). They are estimated to constitute 13% to 26% of all intracranial tumors with a prevalence of 97.5/100,000 in the United States (2-4). Patients with intracranial meningiomas may present a wide variety of symptoms regarding the location of the tumor, such as headache, epileptic seizure and impaired vision (5, 6). However, transient ischemic attack (TIA) is an uncommon presentation of meningiomas (7, 8). We describe the case of a patient with an intracranial meningioma manifesting initially as TIA and make a brief review upon the possible explanations of the event.

CASE REPORT

A 56-year-old woman was admitted on the Emergency Department complaining of a transient weakness on the right arm lasting 30 minutes with complete strength recover. Her past medical history was remarkable for diabetes mellitus type 2 on use of subcutaneous insulin three times daily. On clinical assessment of the patient, we found blood pressure 130/90mmHg, pulses 80/min and temperature: 37.3°C. The neck was supple without abnormal carotid artery sounds, lungs were clear and the heart rate was regular with no murmurs. Neurological examination was essentially normal. Laboratorial blood investigation, chest radiography and electrocardiogram were within normal range. Brain magnetic resonance image (MRI) showed an extra-axial large mass lesion, with 3.91cmx6.47cm on diameter, compressing the left fronto-parietal lobe and with homogeneous gadolinium enhancement (Figure 1, 2 and 3). No signs of cervical or cranial arterial stenosis or occlusions were identified. As no other structural abnormality was found, a diagnosis of an extra-axial intracranial tumor was made and the symptoms were attributed to it. Based on this diagnosis, the patient underwent surgical removal of the lesion. Complete mass and dural excision was performed without major complications. Histological investigation revealed meningothelial meningioma. The patient presented an uneventful recovery without neurologic deficits and was discharged home in good clinical condition. She is currently being follow-up on outpatient appointments.
DISCUSSION

Meningothelial cells tumors are among the most common neoplasms of central nervous system. The majority of cases have a benign clinical course, and some are asymptomatic. Meningiomas are generally well circumscribed, slow-growing lesions that are often amenable to total surgical resection and account for 13% to 26% of all intracranial tumors with a prevalence of 97.5/100,000 in the United States (2-4). They usually manifest as slowly progressive signs of neurological deficits, headache or focal seizures (2). However, transient ischemic attack (TIA) is an uncommon presentation of meningiomas and few is known about the pathophysiological pathways that lead to ischemia (7, 8). According to Kondziolka and colleagues (1988) (8), between all pathologically confirmed cases of brain tumor, only 2.76% of patients had an initial presentation suggestive of occlusive cerebrovascular disease.

A possible explanation for neurologic deficits simulating TIA in intracranial tumors is that the mass causes compression on cerebral blood vessels and edema on the surrounding brain tissue to a degree sufficient to cause partial impairment of cerebral blood flow (CBF) (7, 9). When systemic blood pressure falls or tumor size increases critically the CBF reduces, causing temporary cortical ischemia and paralysis of functions. Whether a readjustment of CBF is possible, the cortical function returns (10).
Additionally, some biological substances, particularly vascular endothelial growth factor (VEGF), produced by cell tumors are known to increase arterial vascular supply. VEGF plays an important role in meningiomas as an angiogenic factor, inducing additional pial supply and corresponding penetration of blood-brain barrier (11). Therefore, it has also been suggested that vascular flow and shunting through the neoplasm could lead to a “steal” phenomenon on adjacent cortex and produce clinical neurological deficits (8, 12). Sawaya and colleagues (1984) (13), hypothesized that certain intracranial tumors may escape host antitumor fibrinolytic activity by producing plasmin inhibitors and that plasmin inhibitors may play a role in the thromboembolic complications frequently seen in patients with intracranial neoplasms. Moreover, hypercoagulability state has been demonstrated in patients with brain tumor (14). Based on this data, it seems reasonable to believe that some patients with meningioma may present thromboembolic episodes causing reduction of CBF and neurological dysfunction. However, more studies are still needed to ensure this possibility.

In conclusion, the present report reinforces the need for a careful clinical and neuro-radiological investigation of patients who present with symptoms of TIA to ensure that such potentially treatable lesions are not missed. Meningiomas are a possible cause of TIA and must be remembered and evaluated in patients manifesting transitory neurologic deficits.

References

Author Information

Lucas Crociati Meguins
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS
lucascrociati@libero.it

Gustavo Botelho Sampaio
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS

Eduardo Cintra Abib
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS

Richam Faissal El Hossain Ellakkis
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS

Marco Aur Teixeira
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS

S Robinson Martucci J
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS

Rodrigo Ant Rocha da Cruz Adry
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS

Dionei Freitas de Morais, Neurosurgeon-in-Chief
Department of Neurological Sciences. Hospital de Base da Faculdade de Medicina de SS