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Carotid free-floating thrombus in woman with meningioma: a case report and review of the literature

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Abstract. – OBJECTIVE: Several reports have previously described the coexistence of severe carotid artery disorders and brain tumors, in particular meningioma, mainly consisting of arterial occlusion or obstruction due to direct compression by tumor mass, with possible presence of transient neurological symptoms as well as complete cerebral infarction.

Free-floating thrombus (FFT) is an uncommon condition, characterized by the presence of thrombotic material partially attached to the arterial wall with evidence of heartbeat associated floating.

To our knowledge, our case represents the first report in literature about presence of internal carotid FFT in patient affected by meningioma.

CASE REPORT: In this report, sharing singular images and videos of this uncommon condition, we present the case of a right internal carotid artery FFT in a 59-year-old woman affected by meningioma, successfully treated with antiplatelet medication together with anticoagulation and high dose of statins.

CONCLUSIONS: Our case confirms the possible association between carotid artery disorders and meningioma, involving for the first time a FFT. These findings make desirable to explore carotid district in patients with brain tumors, especially meningioma, even if symptoms suggestive of ischemic suffering are not present, in order to make an early diagnosis, so preventing marked ischemic events.

Key Words:
Carotid artery, Free-floating thrombus, Meningioma.

Introduction

Several reports have previously described the coexistence of severe carotid artery disorders and brain tumors, in particular in patients affected by meningioma, this association being considered the result of direct compression, radiotherapy or simply coincidence[1-6].

Among carotid artery disorders, a rare entity is represented by free-floating thrombus (FFT); it is an under-reported condition, which real incidence is actually unknown, characterized by the presence of thrombotic material partially attached to the arterial wall with evidence of heartbeat associated floating. Etiopathogenesis of FFT remains unclear, with presence of atherosclerosis and state of hypercoagulability being the most common associated conditions[7,8]. FFT may include different pathologies (intraluminal thrombus, plaque thrombus, embolic thrombus, etc.), reflecting in lack of univocal therapeutic approach, with both medical and surgical treatment used in the course of time[9,10]. The recent acquisitions in the field of computer technology allow us to share singular images and videos of this uncommon condition.

In this report, we present the first case of an internal carotid artery FFT in patient affected by meningioma, successfully treated with medical approach.

Case Report

A 59-year-old African woman, hailing from Cabo Verde, non-smoker, affected by arterial hypertension, with history of right temporal lobe meningioma submitted to surgical treatment and radiotherapy about 8 years before, was hospitalized in our Department of Internal Medicine because of recurrent fainting in the last 3 days. Medical history revealed similar events approximately 2 years ago, for which she did not carry out any further check.

Admission examination showed resting blood pressure 110/60 mmHg, heart rate 75 pulses/min,

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Figure 1. CDU scan showing free-floating thrombus of right internal carotid artery.

SpO_2 97%, respiratory rate 16 breaths/min, body temperature heat 36.5°C. Electrocardiography was unremarkable; urgent brain Computed Tomography (CT) scan performed to exclude ischemic and/or hemorrhagic acute lesions was negative. A Color Duplex Ultrasound (CDU) scan showed the presence of iso-echogenic thrombus of about 1.1 cm × 0.5 cm at right internal carotid bulb, that was little attached to the anterior arterial wall and almost entirely floating according to heartbeat, with normal velocity measurements (Figure 1; CDU video showing right internal carotid artery thrombus almost entirely floating according to heartbeat https://www.youtube.com/watch?v=6pVON90v7nk). An elective contrast-enhanced CT scan confirmed these findings (Figure 2), also evidencing a left pterional relapse of meningioma (Figure 3).

Antiplatelet medication (acetylsalicylic acid, 100 mg daily) together with anticoagulation (low molecular weight heparin, enoxaparin 100 UI/kg b.i.d.) and statins (atorvastatin 80 mg daily) was started and patient was transferred in the care of Division of Vascular Surgery for elective intervention.

The pre-operative CDU scan, carried out 3 days after first diagnosis, revealed nearly complete disappearance of the thrombus, with persistence of minimal parietal remain of about 3.0 mm. That being so, surgery was revoked, going on with the above-mentioned medical therapy. Screening for thrombophilia resulted negative. Patient course was uneventful; she was discharged with recommendation to continue the same medications for the successive 6 months. At further CDU follow-up controls of 1-3 and 6 months, picture remained essentially unchanged (Figure 4); to this day, after two years, patient has remained symptom-free.

Discussion

Meningioma represents a relatively frequent tumor, enclosing 18% of all intracranial tumors; moreover, most of meningiomas do not produce any symptoms, their true incidence being probably underestimated[11]. It represents generally a benign lesion, with clinical square depending on the size and location of the lesion, mainly due to local mass effect[12]. In particular, this tumor has the potential to affect portions of the internal carotid artery and compromise cerebral blood flow, with presence of transient neurological symptoms as well as complete cerebral infarction[13,14]. However, the possible association between meningioma and carotid artery disorders can be considered extremely rare, as reported by Komotar et al[15] that, evaluating retrospectively 1617 patients with meningioma, found an incidence of meningioma-related cerebral ischemia of only 0.19%.

FFT of the internal carotid artery represents a rare entity, which real incidence is actually unknown; its etiopathogenesis remains unclear, with presence of carotid atherosclerosis and state of hypercoagulability being the most common associated conditions[7,8]. To our knowledge, our case represents the first report in literature about presence of internal carotid FFT in patient affected by meningioma.

Figure 2. Sagittal Maximum-Intensity-Projection CT scan, confirming presence of right internal carotid bulb thrombus, little attached to the anterior arterial wall.

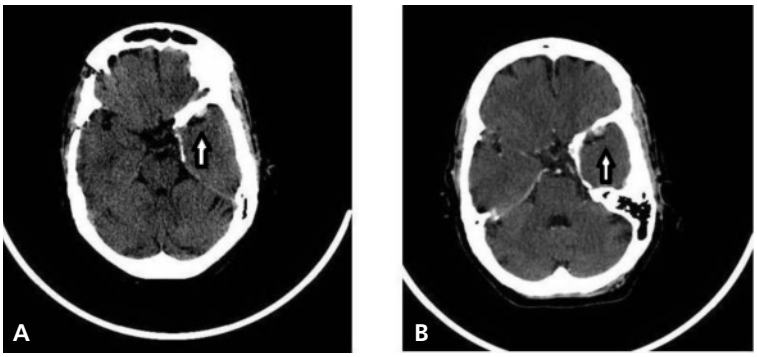

Figure 3. CT scan of brain, showing meningioma with intralesional calcifications in the scan without contrast ***(A)***, becoming hyperdense after contrast administration ***(B)***.

To explain the possible association between carotid disorders and meningioma, some mechanisms have been postulated, as direct compression or radiotherapy; on the other hand, it can also be seen as a simple coincidence.

The first case of carotid siphon occlusion due to direct compression by a brain tumor was described by Constans et al[1] in 1967; the Authors reported a meningioma of the anterior temporal region occluding the supraclinoid segment of the internal carotid artery and middle cerebral artery[1]. Thenceforth, other cases have been described, in most cases involving meningioma presence, but also chordoma, hypophyseal adenoma and optic nerve glioma[2-6].

A direct compression as cause of carotid involvement in our patient with menigioma is not conceivable, because of no contiguity between the two entities; rather, a possible role of radiotherapy can be postulated, even if our patient had been submitted to this treatment about 8 years before. In fact, radiotherapy of brain tumors can cause intimal hyperplasia and disruption of the normal architecture of the elastic laminae of the arterial wall, producing variable entity of stenosis of the lumen, which may favour also successive thrombosis of the artery[16,17]. Elapsed time has been long, but patient has been always asymptomatic, like was now; moreover, she was not submitted to any diagnostic analysis of the carotid district.

Another factor to be considered is the meningioma relapse that has affected our patient, as evidenced by CT scan. It has been demonstrated that coagulation changes occur as a result of substances produced by brain tumors; in 1984 Sawaya et al[18], assaying fragments of several tumor species for degree of plasmin inhibition,

Figure 4. One month CDU scan revealing nearly complete disappearance of the thrombus, with persistence of minimal parietal remain of about 2.0 mm.

found increased antiplasmin activity in a parasagittal meningioma that had occluded the superior longitudinal sinus.

Conclusions

Our case confirms the possible association between carotid artery disorders and meningioma, making desirable to explore carotid district in patients with brain tumors, especially meningioma, even if symptoms suggestive of ischemic suffering are not present, in order to make an early diagnosis, so preventing dramatic ischemic events.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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