CASE REPORT

Giant wing sphenoid meningioma with principal manifestation depression

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Abstract
A 68-year-old woman with no previous mental illness presented with a three-month history of decreased energy, fatigue, feelings of hopelessness, pessimism, difficulty concentrating, and persistent feelings of “emptiness”, worthlessness, insomnia, appetite loss, diminished functionality. The patient’s neurological examination was normal. She was diagnosed with major depressive disorder (MDD) by Diagnostic and Statistical Manual of Mental Disorders (DSM) IV criteria and received psychiatric treatment. Resistance at therapy led to cerebral axial computed tomography (CT) indication. Cerebral CT-scan revealed an intracranial expansive mass (EPIC) located in frontal-temporal (F–T) right lobe, size 42/45/66 mm, hyperdense lesion, without peri-lesional edema, inserted on the great sphenoid wing, image suggestive for meningioma. MRI confirmed the presence of tumor and angiography showed the arterial source of the meningioma. The neurosurgical intervention removed successfully the tumor. Grossly examination revealed a giant tumor with a maximal diameter of 7 cm. The histological aspect of the tumor was highly representative for the diagnosis of meningioma. The patient’s mental status was evaluated at baseline, in the preoperative period and postoperative period and had used Hamilton Depression Rating Scale (HDRS) – 17 items version, Clinical Global Impression Scale (CGI), and Global Assessment of Functioning (GAF). After neurosurgical intervention, functioning was improving with complete remission of depression symptoms at six-month postoperative evaluation. Conclusion: Most meningiomas are slow growing and many are found incidentally. The decision to perform a cerebral CT-scan depends on the clinician’s degree of suspicion that a tumor is present. A first depressive episode is a clinical condition with principal indication for cerebral CT-scan.

Keywords: depression, meningioma, histopathology, neurosurgery.

Introduction
Meningiomas are extra-axial tumor arise from arachnoid cap cells. May occur anywhere that arachnoid cells are found between brain and skull, within ventricles and along spinal cord. These lesions can occur in people of any age but commonly present in middle age. Women are more likely to develop a meningioma, with a female/male ratio of approximately 2:1 intracranial and 10:1 in the spine. Most meningiomas are benign ("classic", grade I), well circumscribed, slow growing, and curable by surgery depending on location [1]. The clinical symptoms are usually dependent on the anatomic site involved, but many were found incidentally. The three most common symptoms are headaches, mental status changes, and paresis [2].

Patient, Methods and Results
A 68-year-old woman with no previous mental illness presented with a three-month history of persistent sad, feelings of hopelessness, pessimism, helplessness, worthlessness, insomnia, appetite loss, decreased energy, fatigue, being slowed down, difficulty concentrating, remembering and making decisions, loss of work/interest, lack of energy, lack of insight, diminished functionality. She was diagnosed with MDD by DSM IV criteria.

Patient received antidepressant, anxiolytic drugs, and mood stabilizers.
Cardiologist prescribed antihypertensive medication for an oscillator hypertension.
The neurological examination was normal and patient did not report any episodes of headache or seizures.
Patient’s state was evaluated at baseline and weekly, period of one month. It had used HDRS – 17 items version, CGI, and GAF.
A 50% reduction in HDRS score compared with
baseline served as an efficiency reduction for the finale results estimation (response definition).

Remission of depression was definite by HDRS score \(<=7\).

The following physical determinations and psychometric tests were made at baseline and monthly: laboratory blood tests, complete history, physical examination, blood pressure, pulse, weight, and electrocardiography.

A good evolution had noted in the first two weeks of therapy, but a progressive aggravation of symptoms appeared in third week. This is reflected in the variation of HDRS score (Figure 1) and also in variation of CGI and GAF scores. This period is called preoperative (pre-Op.).

**Figure 1 – Variation HDRS score in pre-Op. period.**

Initially the patient attributed these symptoms of her age and familial problems, but the symptoms was continuing to worsen, despite of correct treatment. After one month, she still not demonstrated a stable response to the medication.

An organic cause had suspected to produce this resistance at therapy and a cerebral CT-scan was indicated.

The aspect of CT-scan (Figure 2) indicate an EPIC in frontal-temporal (F–T) right lobe, origin on the sphenoid wing, net contour, homogeneous, spontaneous hyperdense, with middle compression on the right ventricular horn and little left shift. The CT-scan images suggested F–T right lobe meningioma with 42/45/66 mm in size.

**Figure 2 – Cerebral CT show a giant expansive tumor, in the F–T right lobe with origin on the sphenoid angle, homogeneous, spontaneous hyperdense, with reasonable compression effect on the right ventricular structures.**

The presence of tumor explains the resistance at therapy. The most important clinical manifestation of brain tumor was depression. Often, CT imagines are the initial used study, but magnetic resonance imaging (MRI) with gadolinium contrast is considered the gold standard.

MRI show a giant tumor F–T right lobe: 42/45/66 mm, net limits, intense, homogeneous contrast enhancement, suggestive for meningioma. The lesion has a middle mass effect on the right anterior ventricular horn (Figure 3).

**Figure 3 – (a) MRI frontal section; (b) MRI sagittal section. Cerebral MRI show an important tumor F–T right: 42/45/66 mm, net contour, intense, homogeneous contrast with meningioma appearance and reasonable compression effect on the right ventricular structures.**

Angiography has a high degree of confidence in recognizing the arterial source of the meningioma. The digital cerebral angiography show EPIC giant F–T, right lobe, injected from right external carotid artery (ECA), with mass effect on the lateral ventricle and vascular cerebral structures (important ascension of right middle cerebral artery) (Figure 4).

The complete removal of the tumor is associated with a lower risk of recurrence or progression and neurosurgical management consisted in total tumor removal in this case.

Grossly examination revealed a giant tumor with a diameter of 7 cm, color white-red, well delimited, with insertion on right wing of sphenoid, intense injected from right ECA and strong consistence.

The histological aspect of the tumor (Figure 5), characterized by a population of meningothelial cells accompanied by rare psammoma bodies, is highly representative for the diagnosis of meningioma.

The specification of the histological subtype requires supplementary considerations. The fusiform aspect of the tumor cells (fibroblast-like) disposed in thick bundles, closely packed with a significant network of collagen, could be included according the World Health Organization (WHO) Classification in the subtype of fibrous meningioma.
Angiography has a high degree of confidence in recognizing the arterial source of the meningioma. The digital cerebral angiography show EPIC giant right F–T lobe, injected from external carotid artery right (ECA), with important compression effect on the ventricular and vascular cerebral structures (important ascension of right middle cerebral artery).

Professor J. Kepes, the most reputed specialist in the domain of meningioma, sustains that the tumor, made of transitional cells between the meningothelial cells and the fibroblast, named transitional cells, must be considered transitional meningioma [3].

A real challenge was however the histological graduation due to the discordance between the general aspect (suggesting an atypical meningioma) and the lack of the malign criteria. The tumor present an evident hypercellularity associated with a loss of the specific architecture, this aspect frequently accompanying the atypical meningioma. The absence of the tumoral necrosis and of the direct type of invasion in the cerebral parenchyma with the breaking of the leptomeninge, as well as the reduced mitosis (approx. one mitosis/10 HPF), points out a meningioma of degree 1.

The histological appearance of a meningioma is an important predictor of tumor behavior and is frequently a factor in decisions concerning therapy. The relationship between histological features and prognosis is formalized in grading schemes such as those published by the WHO, most recently in 2007 [1, 4].

The evolution was favorable in post-Op., and both, neurological and psychiatrically examinations were made. Period of study in post-Op. was six-month. CT-study, performed six-months after surgery, showed complete recovered without any residual mass lesion (Figure 6).
The patient reported few episodes of headache but did not report any episode of seizures.

In absence of psychiatric treatment in post-Op. period, psychiatric examination showed an amelioration of symptoms with remission of depression at endpoint. In post-Op., patient was evaluated weekly in first month and then monthly to the endpoint. HDRS final score decrease with more than 50% compared with baseline and absolute value was <7 (Figure 7).

**Discussion**

Meningiomas occur at a rate of 7.8 per 100,000 per year, but only 25% are believed to be symptomatic, with the others being found incidentally. Radhakrishnan K et al. followed 57 asymptomatic meningiomas for 32 months. None of the patients became symptomatic [5].

Most meningiomas are slow growing and cause signs and symptoms by compression of nearby structures. Many meningiomas are found incidentally. The three most common symptoms are headaches, mental status changes, and paresis [2]. In our case, depression was the principal manifestation of meningioma.

Lishman WA cites a frequency of one for 200 undiagnosed primary or metastatic brain tumors among admission to a psychiatric unit [6].

When Remington FB and Rubert SL reviewed the presenting clinical condition among 30 brain tumor patients admitted to a state mental hospital, they found that the three most common sign or symptoms upon admission were depression, memory deficit, and combativeness [7].

The lassitude, apathy, psychomotor slowing, and impaired concentration may be indistinguishable historically from an affective episode. In older patients, one can be much more suspicious when such features occur for the first time. Primary intracranial tumors do not produce specific general medical findings. Because many meningiomas were founding incidentally, observation may be reasonable for many patients.

Clinical rule: A first depressive episode after 50-year-age is cancer or other serious medical disease until proved otherwise [8].

Both anatomic and physiological perturbations in the brain are likely involved in the associations between depression and brain tumors. Tumor treatments are also associated with depression [9], but in our case, the complete removed of tumor leaded at complete remission of depression symptoms.

Two of the most important factors that determine the prognosis in patients with meningiomas are the extent of the resection and the tumor’s histological grade.

The WHO has now subdivided meningiomas into three separate categories defined as benign (I), atypical (II), and anaplastic or malignant (III) [1].

The clinical behavior of the syncytial, transitional, and fibroblastic histological types is identical. Although the vast majority of meningiomas are benign, a rare malignant form exists.

The overall prognosis for meningiomas is good and, as expected, somewhat dependent on tumor histopathology. In a single series of 1799 meningiomas from 1582 patients followed for an average of 13 years post resection, the no recurrence rate was 93% of WHO I tumors, 65% of WHO II, and 27.3% of WHO III [10].

Numerous molecules, most notably the proliferation-associated antigen Ki-67 (MIB-1), have been investigated for their potential to improve on the information provided by the grading system.

Currently, the only adjunct marker commonly used in the evaluation of meningiomas is the proliferation marker Ki-67. The Ki-67 antigen is a nuclear protein present only during the active phases of the cell cycle (G1, S, G2, and M) [11].

The MIB-1 antibody recognizes the Ki-67 antigen, and be used on paraffin sections. The MIB-1 LI calculated as the percentage of tumor cell nuclei that stain positive out of the total number of tumor cell nuclei counted.

As far as predicting decreased recurrence-free survival, most (but not all) studies show a significant correlation with MIB-1 LI’s in either a multivariate analysis which adjusts for extent of resection, or when only tumors with a gross-total resection was considered [12–15].

The activation of Progesterone Receptors (PRs) it been, postulated may play a role in meningioma growth. Meningiomas are more common in women than men are, and rapid growth and an exacerbation of symptoms have observed, during pregnancy [16]. It is well established that higher-grade tumors are more frequently PR+ negative [17, 18].
Positivity for estrogen receptors is correlated with aggressive histological characteristics, and chromosomal abnormalities; these same features are associated with PR-negativity [19].

The genetic abnormalities seen in meningiomas are numerous and thus support the idea of progression. Histological progression with tumor recurrence does occur, but in only a fraction of cases. A loss of heterozygosity for markers on chromosome 22 in the region of the NF2-gene (22q12) was demonstrated in 40 to 70% of meningiomas [20, 21].

Advances in radiological imaging techniques, such as CT and MRI, have improved the surgeon’s ability to predict the success for complete removal of the mass. Imaging information about the dural attachment site, location and severity of edema, and displacement of critical neurovascular structures is useful for planning the operative approach and does affect outcome.

Conclusions
Every way when a patient after 50-year-old presents a first depressive episode and depression is resistant at psychiatric treatment, patient did not have a history of mental illness, we must suspicion a brain organic cause.

References

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