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Lipomatous Meningioma: A Rare Variant of a Commun Tumor

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Abstract **Case Report**

Meningiomas are the most common primary intracranial tumors, accounting for approximately 20% of all intracranial tumors. Lipomatous meningiomas are a rare variant of meningiomas, constituting less than 1% of all meningiomas. We report a case of an 83-year-old woman who presented with decreased visual acuity. CT and MRI revealed an extra-axial mass in the left cerebellopontine angle with lipomatous features.

Keywords: Lipomatous meningioma, extra-axial, brain tumor, MRI.

INTRODUCTION

Meningiomas are the most common extra-axial tumors of the central nervous system. They represent approximately 20% of primary tumors of the brain and spinal cord [1, 2]. They are usually benign, slow-growing lesions that occur most often in mid-to-late adulthood and more commonly in women. The World Health Organization (WHO) classification system classifies meningiomas into three groups: benign (grade I), atypical (grade II), and malignant (grade III) [3].

Lipomatous meningiomas or meningiolipomas are a rare subtype of metaplastic meningioma. Although the exact incidence of this type of meningioma is not known, it is considered a rare entity. Classified as WHO grade I and they have a good prognosis. Radiologically, it presents the same imaging characteristics as a classic meningioma associated with a fatty component. We discuss here the case of an 83-year-old woman who presented with reduced visual acuity. Computed tomography showed an extra-axial mass in the left cerebellopontine angle of low density, was hyperintense on T1-weighted magnetic resonance images, and had decreased intensity on imaging with fat-suppressed sequences. The patient refused surgery.

CASE PRESENTATION

An 83-year-old patient, with no significant medical history, presented with a headache associated with a drop in visual acuity for more than 3 months, without focal neurological deficit, her pupils were isocoric with an intact sphincter reacting to light stimulation. Ophthalmological examination revealed bilateral papilledema. Biochemical blood tests revealed no abnormalities.

Computed tomography (CT) showed a well-defined extra-axial mass, oval in shape, located in the left cerebellopontine angle, presenting lipid density without calcification, complicated by triventricular hydrocephalus (Figure 1). There was no sign of bone erosion. On magnetic resonance imaging (MRI), the lesion was hyperintense on T1 and T2 weighted images (WI), hypointense on T1 weighted fat saturation images (Fat Sat), without restricted diffusion, presenting discreet T1 Fat Sat contrast enhancement (Figure 2).

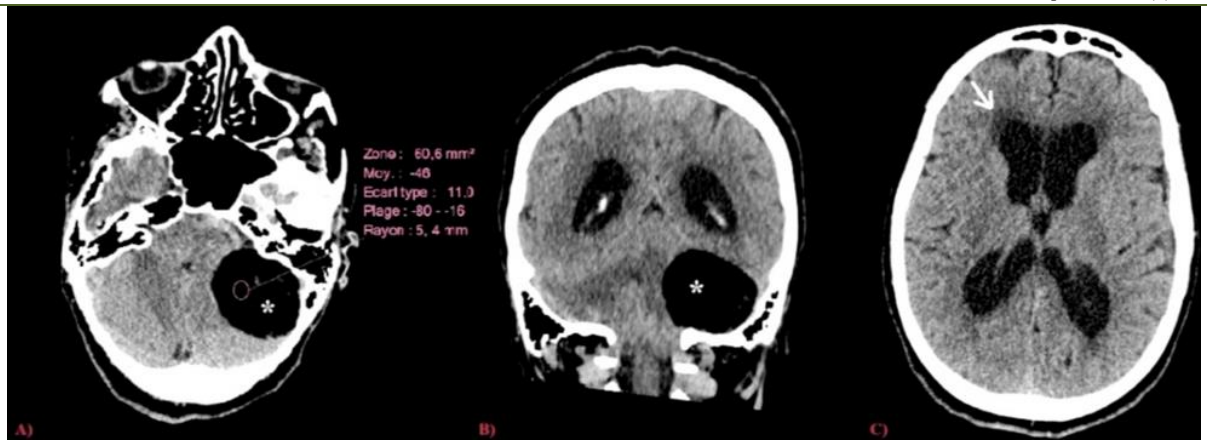

Figure 1: CT scan in axial (A) (C) and coronal reconstructions (B) shows an extra-axial mass located in the left cerebellopontine angle with lipidic density (asterisk) associated with hydrocephalus (arrow) (C)

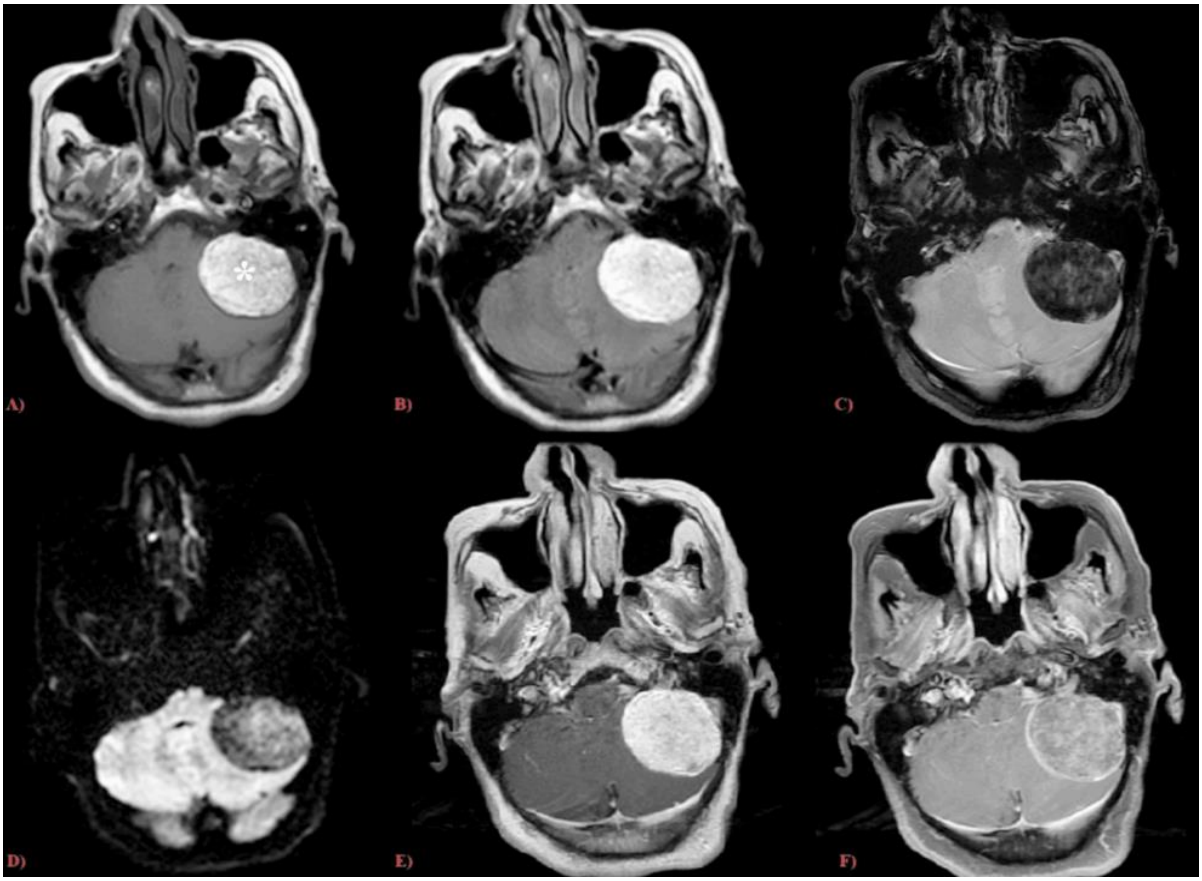

Figure 2: MRI scans in axial weighted shows the extra axial process presenting lipomatous characteristics(asterisk) : hyperintense in T1 (A) and T2 (B), hypointense T1 fat saturation (Fat Sat) WI (C), with no restricted Diffusion (D) , presented a discreet contrast uptake T1 Fat Sat WI (E and F)

A radiological diagnosis of a lipomatous meningioma of the left cerebellopontine angle was made. The patient later refused to have surgery. Two weeks later, the patient returned to the emergency room with worsening headaches, nausea, and vomiting associated with difficulty walking and loss of balance. An external ventricular drain was immediately placed, which resulted in improvement of clinical symptoms.

DISCUSSION

Based on the WHO classification of meningiomas, lipomatous meningiomas are a subtype of metaplastic meningiomas that are considered to be benign, grade 1 lesions with a good prognosis. They contain diverse mesenchymal cells that can differentiate into different subtypes, including fat cells. Lipoblastic or lipomatous meningioma are terms used to describe this type of meningioma, and in 2003 Bolat *et al*., created the term "lipidized" to refer to them [3].

Meningiomas account for 20% of all primary tumors of the central nervous system [3, 4]. These are extra-axial tumors, usually benign, and of arachnoid origin [3]. The incidence of these tumors is higher in women and increases with age. Certain predisposing factors are recognized: hormone therapy, history of radiation therapy, and neurofibromatosis type 2 [3, 4]. Meningiomas recur in about 20% of cases, and metastases remain exceptional. The recent WHO classification distinguishes 13 histological subtypes of meningioma, including metaplastic meningioma [3]. The latter contains xanthomatous cells or, in varying proportions, contains an osseous, cartilaginous, myxoid, or adipose component [3]. Meningiomas with an adipose component, also known as lipomatous meningiomas, represent less than 1% of the meningiomas operated on at the Mayo Clinic [5].

The clinical presentation of patients with a lipomatous meningioma is similar to that of patients with a classic meningioma. An epileptic seizure is the most common mode of revelation, but the location and compression of adjacent brain tissue may lead to focal neurologic deficits [5]. In our case, it was presented with a progressive loss of sight.

At CT imaging, traditional meningiomas appear as solid extra-axial lesions with dura attachment; they present a density similar to the cerebral parenchyma with homogeneous contrast enhancement. Lipomatous meningiomas appear as hypodense extra-axial tumors on scan and have a hyperintense signal in T1 and T2 WI with signal loss in fat suppression sequences on MRI when the adipose component is significant [5, 6]. Contrast uptake is discreet [5, 6], as it is typically presented in our case.

Histologically, lipomatous meningiomas usually correspond to meningothelial, fibroblastic, or transitional meningiomas with lipid accumulation [5]. The cells containing lipids morphologically resemble either mature adipocytes or lipoblasts, which are characterized by a nucleus encased by intracytoplasmic fat vacuoles [7]. All lipomatous meningiomas currently described do not have a histological character to classify them in the atypical category according to the WHO criteria [7]. The histogenesis of lipomatous meningiomas remains debated.

The selection of treatment for meningiomas is highly personalized and can include a combination of observation, surgical removal, radiotherapy, and, in some cases, chemotherapy [8]. The potential effects of different treatments can vary significantly [8]. Thanks to the recent developments in neurosurgery, neuroimaging, and neuroanesthesia, patients now have improved long-term results, retreatment-free survival, and overall survival [8].

CONCLUSIONS

Lipomatous meningioma is a very rare subtype of metaplastic meningioma. Clinical presentation is not specific and is common to all types of meningiomas. Imaging and histology show specific characteristics of lipidic components. Depending on the clinical presentation and condition of the patient, treatment can range from abstinence to surgery or radiotherapy.

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