

# Unusual intracranial melanoma: a case report

## Melanoma intracraneano no usual: reporte de caso

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### Abstract

**Introduction:** Melanomas are malignant cutaneous melanocytes tumors. They have great potential to metastasize. The third most frequent site is the cerebral parenchyma (20% - 25%). Usually, intracranial metastases occur in most advanced cancer. About 50% of the metastases cancer are asymptomatic. This paper aims to illustrate the difficulties in brain expansive lesions diagnosis, reporting one tumor case. **Case report:** A forty-three-year-old man had an acute insidious onset of a chronic headache at the bitemporal region, with irradiation to the occipital region. He underwent CT, which has shown an expansive lesion in the posterior cranial fossa, on the left side, which presented a hypertensive hematoma. A craniectomy was performed, revealing a blackened and bleeding injury, discarding the hypothesis of hypertensive hematoma, with pathology confirming the diagnosis of melanoma. **Discussion:** Many cases do not present clinical manifestations, and the mass effect could happen in tumor cases, primary or metastasis or stroke bleeding lesions. In cases with suspected metastases, gadolinium magnetic resonance is the best method to rule out differential diagnoses, and surgical resection is considered the standard reference in treatment. **Conclusion:** Brain metastases of melanomas could present several different diagnoses in different locations. Es esencial que el equipo neuroquirúrgico piense alguna vez en estas lesiones como un diagnóstico diferencial en las lesiones hemorrágicas agudas.

**Key words:** Melanoma, neoplasm metastases, intracranial hemorrhage, differential diagnoses.

### Resumen

**Introducción:** Los melanomas son tumores cutáneos malignos de melanocitos. Tienen un gran potencial de metastización. El tercer sitio más acometido es el parénquima cerebral (20% a 25%). Generalmente, las metástasis intracraneales ocurren en las fases más avanzadas del cáncer. Alrededor del 50% de los casos no presentan manifestaciones clínicas. El objetivo del texto es ilustrar las dificultades diagnósticas entre las lesiones expansivas cerebrales, ilustrando un caso de tumor. **Relato de caso:** Paciente masculino, 43 años, inicialmente, cursó con cefalea crónica agudizada de inicio insidioso en regiones bitemporal, con irradiación para región occipital. Se sometió a (CT) que al principio evidenció lesión expansiva en la fosa posterior a la izquierda que se presentaba como un hematoma hipertensivo. Realizada la craneotomía, se evidenció lesión ennegrecida y sangrante, descartando la hipótesis inicial de hematoma hipertensivo, con estudio anatomopatológico confirmando el diagnóstico de melanoma. **Discusión:** Muchos casos no presentan manifestaciones clínicas evidentes, los efectos de masa pueden ser similares entre los tumores primarios, de los oriundos de metástasis o de lesiones hemorrágicas de un accidente cerebrovascular. En casos con sospechas de metástasis, la resonancia magnética con gadolinio es el método principal de diagnóstico y el método de elección para descartar diagnósticos diferenciales. La resección quirúrgica se considera patrón de oro en el tratamiento. **Conclusión:** Las metástasis cerebrales de melanomas presentan diversos diagnósticos diferenciales en diferentes localidades. Es de suma importancia, para equipo de neurocirujanos, pensar en los diagnósticos diferenciales de esas lesiones.

**Palabras clave:** Melanoma, metástasis, hemorragia intracraneal, diagnósticos diferenciales.

**Introduction**

Melanoma is a malignant cutaneous tumors of melanocytes (cells responsible for cutaneous pigmentation) and the most bleeding metastatic tumor and it is associated with significant morbidity and mortality. It usually occurs between the ages of 30 and 60<sup>1</sup>. The average age at diagnosis in general population is 57 years-old for men and 50 for women. In Brazil, it is estimated that approximately 4,000 new cases of melanoma are diagnosed each year<sup>3</sup>.

The melanoma metastases are often preceded in frequency and prevalence by bronchogenic carcinomas 40-60% and breast cancer 20-30%<sup>22</sup>. However, melanoma has a higher risk of bleeding than those<sup>25</sup>. The primary tumors, which are most associated with hemorrhagic metastases, are neoplasms of the kidney, thyroid, melanoma, and choriocarcinoma<sup>5</sup>. Cerebral metastasis occur in 10-20% of patients with choriocarcinoma, which is most hemorrhagic metastases, although the choriocarcinoma is not common as melanoma. It is estimated that about 20-25% of cancer patients develop brain metastases<sup>22</sup>.

Intracranial metastases occur most commonly in the late stages of cancer. They are more prevalent in the supratentorial region<sup>2,12</sup> and are associated with significant morbidity and a reserved prognosis with a low overall survival. This paper aims to illustrate the difficulties in brain expansive lesions diagnosis, reporting one tumor case.

**Case report**

A 43 year-old man, attendant at a gas station, married, catholic, born in São Paulo countryside and hypertensive, with no other comorbidities. He complained of asthenia and chronic headache intensified two weeks before the admission that had insidious onset increasing, in bitemporal region which radiated to occipital region. It had high-intensity headache episodes 10/10 at Visual Analogic Scale (VAS). There was any association with photophobia or phonophobia. It did not an improvement or worsening factors and did not exhibit prodromes and no evident neurological deficits preceded the headache episodes. Glasgow Coma Scale (GCS) was 15, without pupillary

or neurological changes. A Computed Tomography (CT) was taken (Figure 1) which has shown a hyperdense lesion in the posterior brain fossa near cerebellar and medullary region on the left side, with mass effect. The aspect of the image indicates dural base bleeding injury. He underwent a Digital Angiography on the same day that did not find vascular abnormalities. It was performed a gadolinium-based Magnetic Resonance Imaging (MRI) (Figure 2). In that time he maintained the symptoms. The MRI has reported an extra-axial lesion with a dural tail in the clivus direction and an essential portion of the occipital bone, suggesting meningioma. The IV ventricle was laterally displaced. However, there were no signs of obstruction or supratentorial hydrocephalus secondary to obstruction of the IV ventricle. MRI was necessary because the evidence from CT was inconclusive.

The patient underwent a rectosigmoid craniectomy extended to midline and foramen magnum on the cerebellar angle, on the left side. During the procedure, it was reported a well-defined black lesion that compressed the hy-

poglossal nerve, associated with small volume blackened injuries scattered throughout the cerebellar parenchyma. In freezing biopsy, the material was compatible with the diagnosis of melanoma.

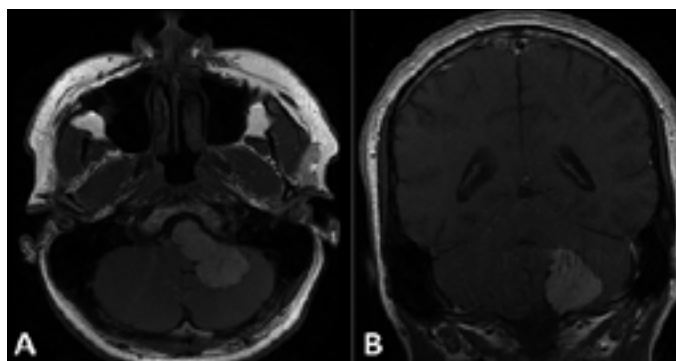
**Discussion**

Typically, intracranial melanoma metastases consist of single or multiple nodules with increased attenuation on CT. Most brain metastases appear as rounded lesions, with diffuse or annular enhancement. They are often surrounded by severe perilesional edema, not keeping proportion to the size of the injury. They may have the variable expandable effect and frequent intratumoral hemorrhage<sup>9</sup>.

In the genesis of melanomas, numerous factors can be mentioned. The main risk factors are genetic causes: CDKN2A gene p16 and the chromosome 9p21 and CDK4 gene on chromosome 12. These genes act on the regulation of the cell cycle. The penetration of mutations in the genes increases according to the degree of sun



**Figure 1.** (A) CT scan, coronal image, of the skull without contrast showing a hyperdense injury in the posterior fossa in the left cerebellum; (B) CT scan of the head without contrast, comparison (hyperdense lesion in posterior fossa in the left cerebellum); (C) CT scan of the head without contrast (hyperdense lesion in the posterior fossa in the left cerebellum).



**Figure 2.** (A/B) MRI lesion with a dual tail in the clivus direction and an essential portion of the occipital bone.

exposure that encompasses physical factors (ultraviolet rays with a defect in DNA repair)<sup>21,1,2</sup>, and biological causes (hormonal). The risks of developing melanoma in patients with a family history are about 2 to 3 times higher than those who do not have a family history of melanoma. About 8% to 14% of patients diagnosed with melanoma have a positive family history of neoplasia<sup>21</sup>. The influence of biological factors is related to hormonal changes. These changes are related to the presence of prepubescent melanoma and the hormone-stimulating pigmentation (MSH). Such hormone is present in high levels in dark-skinned patients (who have a lower incidence of melanomas). The actual hormonal influence is not defined<sup>21</sup>.

Melanomas have great potential to generate metastases with a considerable association between the with and the level of invasion of the lesions<sup>1</sup>. Approximately 33% of patients with metastatic tumors do not present the previous history of molecular cancer mechanisms are not well known yet. The proliferation of neoplastic cells may be related to specific brain characteristics, such as selective blood-brain barrier, high energy consumption, high nutritional demands, and specific immunologic input<sup>20,24</sup>. Metastases may be local, regional, or systemic<sup>1</sup>. Usually, the melanomas produce multiple metastases, compared to breast carcinoma that often causes a single lesion<sup>22</sup>.

The primary neuroimaging methods for the diagnosis of brain metastases are CT and contrast MRI. The gadolinium-based MRI is considered the method of choice for the evaluation of suspected lesions<sup>2,21</sup>. In cases of metastatic lesions, the surgical resection is mainly advised in patients with only injuries.

It is an essential highlight that lesions of different nature could have similar radiological features. Examples of that are inflammatory and infectious processes (granulomas and abscesses), vascular (reabsorption hemorrhages, infarcts), and primary brain neoplasms. As well, metastases may present with different radiological aspects. The main symptoms are related to the increased intracranial pressure found in approximately 90% of patients<sup>21</sup>. Other symptoms can be given as motor deficits, altered level of consciousness, Wernicke's aphasia, Broca's aphasia, men-

tal confusion, focal neurochemical deficits, among others<sup>5,21,23</sup>. About 50% of brain metastases do not present visible clinical manifestations, and the signs can be similar between primary tumors and metastases. The early diagnosis of skin lesions is essential for better prognosis and increase of the overall survival. On microscopic examination, the border between the tumor and the brain tissue is transparent, unlike the gliomas, where the neoplastic cells merge into the nervous tissue diffusely.

The leptomeningeal involvement presents bad prognosis with a global survival of 4 to 6 weeks<sup>25</sup>. Surgical resection is considered a standard reference in treatment for brain metastases combined with a more complex approach, with radiotherapy and chemotherapy radiosurgery<sup>6,14</sup>.

The Table 1 shows the location of the most common primary tumors.

Since the first CT scans without contrast injection, the main characters in issue were based on the difficulty and accuracy of the diagnosis of melanoma. The lesions have presented several distinct aspects and several different diagnoses that did not correspond to the patient's clinic. These images (Figure 1) has shown a hyperdense lesion in the posterior fossa in the left

cerebellum region. It has suggested spontaneous hematoma, with the first diagnosis of bleeding in the cerebral parenchyma and treatment in ICU.

Metastatic brain tumors manifest with the same clinical signs of primary intracranial tumors. In our patient, the clinical reports were very similar to primary brain tumors, such as benign astrocytoma, choriocarcinoma, neuroblastoma, meningioma, melanotic meningioma, among others<sup>10,22</sup>.

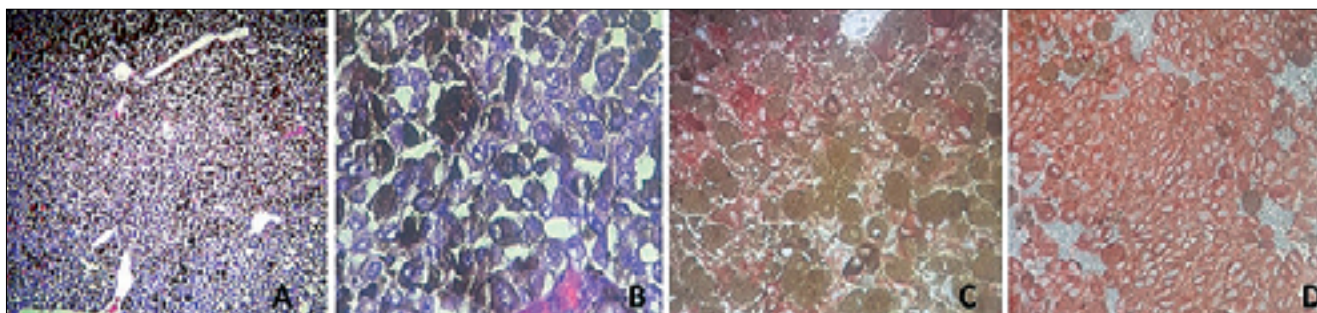
In patients with a single lesion in the brain and without evidence of systemic cancer, there is a 15% probability that this lesion represents a metastatic disease. Approximately one-third of patients with metastatic brain tumors have no previous history of cancer<sup>2,10</sup>.

Intraparenchymal bleeding could be a differential diagnose in this case. The histopathology and immunohistochemistry demonstrated the melanocytic nature (Figure 3), thus, confirming the diagnosis of melanoma.

Patients with brain metastases have a poor prognosis, and the purpose is prolong survival and improve the patient's quality of life<sup>10</sup>. The early diagnosis of skin lesions, which seem to be melanoma, increases the prognosis and helps in the most popular therapeutic basis for each case.

**Table 1.**  
**Location of major primary tumors. Adapted<sup>25</sup>**

Location	Tumor
Cerebral (supratentorial)	Astrocytoma Meningioma Oligodendroglioma Metastatic lesion Lymphoma
Cerebellum and Trunk (Infratentorial)	Schwanoma Meningioma Neuroectoderma Primitive Tumor (PNET) Germ cell tumor (germinoma, teratoma) Astrocytoma Meningioma Pineal cyst
Lateral ventricles	Astrocytoma Ependioma Central neuropathy
Third ventricle	Astrocytoma Colloid cyst Central neurocytoma



**Figure 3.** (A) A small increase (40x), showing numerous pigmented cells; (B) Hematoxylin and eosin staining, the addition of (400x); (C) Immunohistochemistry for marker Melan-A showing positivity in red; (D) Immunohistochemistry with positivity in red for marker HMB-45, demonstrating the melanocytic nature. In those cells, it is possible to identify the cellular contour and extensions.

### Conclusion

Melanoma has a great capacity to generate brain metastases. They usually manifest with the same clinical signs of primary intracranial tumors. The neuroimaging aspects of a metastasis could have characteristics of other types of lesions. Brain metastases are the most

frequent brain tumors. Clinical manifestations are based on increased intracranial pressure with focal neurological deficits and bleeding lesions. Metastases are more frequent in the supratentorial regions and are commonly associated with hemorrhagic lesions. Patients with brain metastases have a reserved prognosis, the purpose is to

improve the patient's quality of life. The treatment is based on surgical resection. The neurosurgeon must have in mind the differential diagnoses for that kind of lesions, and remember melanoma as a possible diagnosis.

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