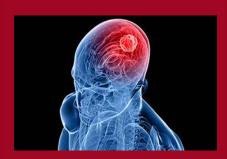
MARCH 2016 VOLUME #2 ISSUE 30

# EM CASE OF THE WEEK

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE

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As an ED physician, one must always be diligent to rule out the most dangerous diagnosis on a patient's differential. Brain masses can often present with vague symptoms, such as headaches, weakness or personality changes/depression. It is important to do a thorough work-up and not dismiss the patient's vague complaints.

#### EM CASE OF THE WEEK

EM Case of the Week is a weekly "pop quiz" for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.



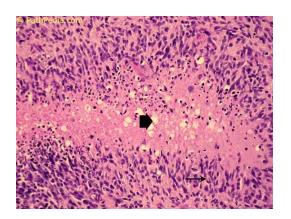
## Glioblastoma Multiforme

A 50year-old female presents to the ED status post fall complaining of mildly slurred speech and left facial droop. She also complains of right-sided headaches for the past 6 weeks. Her vital signs are T 98.2, HR 73, RR 16, BP 133/99. She is examined by the ED physician and sent for a non-contrast head CT. The head CT reveals a 7 cm heterogeneous mass in the right cerebral hemisphere. Patient was admitted and underwent a microscopic dissection two days later. She was ultimately diagnosed with a glioblastoma multiforme tumor. Which of the following statements about glioblastoma multiforme (GBM) is true?

- A. The prognosis for patients diagnosed with glioblastoma multiforme is fairly good, with the 5 year survival rate >50%.
- B. Glioblastoma multiforme is the most common primary brain tumor in adults.
- C. CT scans are superior to MRI scans in the characterization of brain masses.
- D. The initial treatment for high grade gliomas (such as GBM) is chemotherapy.
- E. Gliomas are classified into grades I-IV, and glioblastoma multiforme is considered Grade III.



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# **Take Home Points**

- Metastatic brain tumors are far more common than primary brain tumors.
  Of the primary brain tumors, glioblastoma multiforme (grade IV glioma) is the most common.
- High grade gliomas can often present with a variety of symptoms such as headache, confusion, and changes in speech. The variety and vagueness of the symptoms can make it difficult to diagnose a brain mass.
- Both CT and MRI can be used to characterize brain masses, but MRI is superior.
- The treatment of GBM begins with surgical resection. Due to the high recurrence rate of these lesions, surgical resection is often followed by radiation therapy and chemotherapy.

#### Glioblastoma Multiforme

The correct answer is B. Glioblastoma multiforme is the most common primary brain tumor in adults. Although the most common overall brain tumor in adults is a metastatic tumor, the most common PRIMARY tumor is GBM, followed by meningiomas and schwannomas.

Answer A: GBM is a fast growing malignancy that carries a very poor prognosis. The life expectancy at the time of diagnosis is <1 year.

Answer C: Contrast enhanced MRI scans are far superior to CT scans for the characterization of brain masses.

Answer D: The initial treatment for a high-grade glioma such as GBM is surgical resection; followed by radiation and/or chemotherapy treatments.

Answer E: Gliomas are in fact classified as grades I-IV. However, GBM is a high grade glioma, grade IV (not grade III).

#### Discussion:

Brain tumors may present with vague and/or common symptoms, which can often make the diagnosis difficult. Primary brain malignancies are much less common in adult patients than metastatic tumors, so they are often not thought of in younger patients who present with seemingly unrelated symptoms.

In the case of the patient discussed above, her main complaint in the ER was a fall earlier that morning after she picked up her purse at work. She was forced to come to the ED by her cousin and coworkers. The patient attributed her fall to just losing her balance.

The patient also dismissed her cousin's concerns about her speech and mild facial droop, and attributed those symptoms, as well as her headaches, to her history of clinical depression.

(cont'd. next page)

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MARCH 2016 VOLUME #2 ISSUE 30

### **Diagnosis:**

The diagnosis of a primary brain malignancy begins with an accurate history physical exam, including a full neurological exam.

In the case of high grade gliomas (grades III-IV) such as glioblastoma multiforme, patients often complain of symptoms such as headaches, memory loss, confusion, personality changes, and changes in speech. These symptoms are often caused by tumor growth into the normal brain tissue, or by compression of the normal brain tissue.

Imaging tests are usually among the first tests to be performed once a brain mass is suspected. Although both CT and MRI are useful, MRI often provides a better characterization of the brain mass. In the case of GBM, the lesions are usually hypointense on T1-weighted MRI scans, and show enhancement following administration of IV contrast.

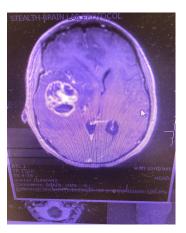


Figure 1: The above stated patient's T1-weighted MRI scan after the administration of IV contrast.

This tumor is also somewhat unique due to the fact that it can occur near the corpus callosum and cross the midline of the brain. (It is sometimes called a butterfly glioma because of this.)



Figure 2: An example of a glioblastoma multiforme tumor occurring at the corpus callosum and crossing the midline of the brain.

Once a brain tumor is confirmed, a tissue biopsy is performed and examined to give a definitive diagnosis. The histologic examination often reveals a hypercellular, pleomorphic tumor that also contains areas of necrosis. Immunostains such as GFAP (which stains astrocytes) can also be helpful with the diagnosis.

#### **Treatment:**

The initial treatment for grade III and grade IV (GBM) gliomas is surgical resection. Unfortunately, these high grade lesions often have poorly defined borders, and may have microscopic extensions beyond the tumor edges. This makes a complete tumor resection very difficult and increases the risk of tumor recurrence. As a matter of fact, almost all high grade gliomas recur, which is why this type of primary brain malignancy has such a poor prognosis.

Because of the high recurrence rate, most patients undergo radiation and chemotherapy (usually with temozolomide) once the tumor has been surgically resected.

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- 1) Lassman AB, Iwamoto FM, Cloughesy TF, et al. International retrospective study of over 1000 adults with anaplastic oligodendroglial tumors. Neuro Oncol 2011; 13:649.
- 2) Claus EB, Black PM. Survival rates and patterns of care for patients diagnosed with supratentorial low-grade gliomas: data from the SEER program, 1973-2001. Cancer 2006; 106:1358.



#### **ABOUT THE AUTHOR:**

This week's case was written by Tracy Rogers. Tracy is a 4<sup>th</sup> year medical student from NSU-COM. She did her emergency medicine rotation at BHN in January 2016. Tracy plans on pursuing a career in Pathology after graduation.