April 2016 Critical Care Case of the Month

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History of Present Illness

The patient is a 22-year-old African-American man who was initially seen following a rapid response team called to the neonatal intensive care unit for a seizure. He was visiting his newborn child. The nurses described the seizure as tonic-clonic which resolved spontaneously without treatment before the rapid response team arrived.

Past Medical History, Family History and Social History

The patient has a past medical history of a brain aneurysm treated by coil embolization 2 years earlier. He had no complications of the embolization including seizures. Family history is unremarkable. He smokes 1-2 cigars per day but does not drink alcohol.

Physical Examination

He was drowsy when initially seen but the drowsiness resolved in about 5 minutes. The physical examination was unremarkable and there were no focal neurologic signs.

What **should be next?**

1. CT scan of the head
2. Phenytoin administration
3. Metabolic screening (BUN, glucose and electrolytes)
4. 1 and 3
5. All of the above

Correct!
4. 1 and 3

The first question is whether the patient had a seizure or a nonepileptic event that mimics a seizure (1). Neonatal ICU nurses are reliable in recognizing a seizure and there was no apparent provoking cause such as head trauma. New onset seizures in an adult is worrisome because it might indicate an underlying lesion such as a tumor or in this case a possible hemorrhage given the previous history of a cerebral aneurysm. The patient appears stable and there is no indication for seizure prophylaxis at this time. Metabolic screening for uremia, hypoglycemia, drug intoxications, and electrolyte disorders should be performed. In this patient's case, the metabolic screening was unremarkable.

The head CT scan was performed and no hemorrhage or other lesion was identified.

What **should be done next?**

1. Electroencephalogram
2. Glucose tolerance test for hypoglycemia
3. Head magnetic resonance imaging (MRI)
4. Holter monitor for arrhythmia evaluation
5. Thoracic CT scan

Correct!

3. Head magnetic resonance imaging (MRI)

Although head CT scans can be performed quickly, they do miss remedial brain lesions that would otherwise be detected by MRI (1). Electroencephalography (EEG) may be useful especially in the case of the recurrent seizures and is not necessarily wrong but currently the first priority is evaluating the patient for a surgically remedial lesion. There is no evidence of hypoglycemia, chest pathology, or arrhythmia and these evaluations would likely not prove useful.

A head MRI was performed (Figure 1).

Figure 1. Representative image from head MRI.

The brain MRI was interpreted as showing a "somewhat ill-defined nonspecific heterogeneously enhancing area at right frontal lobe measuring approximately 1.8 cm in conglomerate, with mild to moderate adjacent edema, may indicate neoplastic etiology".

What is the **next step** in evaluating the patient?

1. Careful physical examination including testicular examination
2. CEA antigen
3. Chest X-ray
4. 1 and 3
5. All of the above

Correct!
4. 1 and 3

Now that a lesion has been identified and is the presumed source of the seizure, the question is whether this is a primary brain tumor or metastatic. Based on the brain MRI the radiologist favored the later. Testicular cancer is not uncommon in young adult men and could be a source for a metastatic lesion in the brain. In addition, there are a number of processes in the chest which might result in brain lesions. It is unclear how a CEA antigen would be helpful.

Testicular examination was unremarkable. The chest X-ray was interpreted as showing small nodules at the lung bases.

What **should be done next?**

1. Biopsy of the brain lesion
2. CD4+ T cell count
3. Chest CT scan
4. Serum prolactin level
5. Video-assisted thorascopy (VATS)

Correct!
3. Chest CT scan

A CT scan will better define the nodules and help narrow the differential diagnosis. VATS and brain biopsy seem overly aggressive at this point. A low CD4+ T lymphocyte count is often seen with HIV+ infection but there is no evidence that the patient has AIDS. Serum prolactin levels are elevated after a generalized tonic-clonic seizure and may be useful in distinguishing between a seizure and a nonepileptic event. However, the prolactin decreases after the seizure fairly quickly.

The thoracic CT scan is shown in Figure 2.

Figure 2. Representative images from the thoracic CT scan. Panels A-D: lung windows. Panels E and F: soft tissue windows.

What is the **most likely cause** of the small lesions on the thoracic CT scan and the lesion in brain?

1. Coccidioidomycosis
2. Lymphoma
3. Metastatic renal cell carcinoma
4. Sarcoidosis
5. Tuberculosis

Correct!
4. Sarcoidosis

The thoracic CT scan shows multiple small lung nodules in both lungs. The nodules touch the pleural surface, and therefore, are not centrilobular nodules as seen in hypersensitivity pneumonitis and some infectious diseases such as endobronchial spread of tuberculosis. The nodules are along the fissures indicating a perilymphatic distribution rather than random nodules. Small random nodules are seen in hematogenous metastases, miliary tuberculosis, miliary fungal infections and Langerhans cell histiocytosis in the early nodular stage. Perilymphatic nodules are seen in lymphatic spread of carcinoma, lymphoma and sarcoidosis. In addition, the thoracic CT shows some thoracic lymphadenopathy. Small perilymphatic nodules and mediastinal lymphadenopathy suggest sarcoidosis in this young African-American man with a brain lesion.

Bronchoscopy with transbronchial biopsy showed noncaseating granulomas as did a biopsy of the brain lesion consistent with sarcoidosis.

What **treatment** should the patient receive?

1. Azathioprine
2. Infliximab
3. Mycophenolate
4. No treatment is necessary. Sarcoidosis usually resolves.
5. Prednisone

Correct!
5. Prednisone

Most patients with asymptomatic sarcoidosis limited to the lymph nodes and lung will recover without therapy. However, some will not and most experts advocate treating extrathoracic sarcoidosis. In this case of neurosarcoidosis with a seizure treatment is indicated. Agents such as azathioprine and mycophenolate are used as steroid sparing agents but do not cross the blood brain barrier. Nevertheless, these agents have been used to treat neurosarcoidosis. Infliximab is a monoclonal antibody against tumor necrosis factor alpha (TNF- α) has also been used to treat neurosarcoidosis.

Our patient was treated with prednisone and has done well without recurrence of seizures.

References

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2. Agnihotri SP, Singhal T, Stern BJ, Cho TA. Neurosarcoidosis. Semin Neurol. 2014 Sep;34(4):386-94. [\[CrossRef\]](#) [\[PubMed\]](#)