

## Imaging Sciences Interesting Cases

### Case 19

Corey Sides, MD

**CLINICAL PRESENTATION:** Patient is a 50-year-old male presenting with septic shock and clinical suspicion of brain death.

**IMAGING FINDINGS:** Tc99m DTPA perfusion image [Fig.1] demonstrates absence of radiotracer within the middle cerebral arteries and the anterior circulation. This is confirmed on the delayed planar image [Fig. 2], additionally there is pooling of tracer within the face and nose on both images, consistent with a “hot nose sign”.

©2007 URMCI Imaging Sciences



**Figure 1:** Anterior perfusion image.

©2007 URMCI Imaging Sciences



**Figure 2:** Anterior delayed planar image.

### **DIAGNOSIS: Brain Death**

**DISCUSSION:** The diagnosis of brain death is primarily a clinical one, however a diagnostic test such as a cerebral radionuclide study is sometimes employed to confirm the clinical suspicion. Nuclear medicine studies utilizing technetium labeled HMPAO or DTPA are commonly used. The diagnosis of brain death is confirmed by the absence of intracerebral blood flow.

A diagnostic sign known as the “hot nose sign” can often be seen scintigraphically and refers to diversion of blood flow from the intracranial carotids to the extracranial carotid arteries resulting in shunting of blood to the nasopharyngeal region. This is caused by the elevation of intracranial pressure relative to cerebral perfusion pressure.

Although this sign is commonly associated with brain death, it is not 100% specific. There are other entities which may have the appearance of internal carotid artery occlusion without brain death: such as acute cerebral vascular accident or transient ischemic attacks, elevated intracranial pressure due to subdural hematoma, or practically any other process causing a mechanical obstruction of the ICA.

**REFERENCES:**

1. Thrall JT, Ziessman HA: Nuclear Medicine: The Requisites, 2nd ed. St. Louis, Mosby, 2001, pp 312-313.
2. Huang AH. The hot nose sign. Radiology. 2005 Apr;235(1):216-7.