Neurosurgical Case of the Month
by Aclan Dogan, MD

October 2009:
Left Frontotemporoporal Mass

Patient history and diagnosis
An otherwise healthy 29-year-old male presented with headaches, reported experiencing bad smells in the absence of potentially foul-smelling objects (olfactory seizures), mild dizziness and nausea. Over the past 2 weeks, headache medications had proved unsuccessful. Past medical history was significant for asthma, headache and seizure. There was no past surgical history. Brain magnetic resonance (MR) images (Fig. 1) revealed a left frontotemporoporal mass. The patient was referred to neurosurgery to discuss treatment options.

**Neurological Examination Results:**
- Mental status: Normal consciousness, orientation, affect and fluency
- Cranial Nerves: 2nd - 12th intact on detailed examination
- Motor: Normal strength, muscle bulk, and tone
- Sensory: Intact to pinprick and light touch
- Cerebellar: Normal finger-to-nose and rapid alternating movements
- Gait: Normal, tandem and romberg negative
- Deep Tendon Reflexes: Present and normo-active
- Pathologic Reflexes: Absent

**Imaging Results**

*Figure 01:* A hyperintense T2 and hypointense T1 signal is evident within the left sub insular white matter, which extends into the anterior left temporal lobe and into the inferior right frontal lobe. The T2 signal demonstrates a mass effect that is irregular in shape. The mass measured approximately anterior-posterior 5.3 cm by transverse 3.2 cm, the bulk within the insula.

Plan and Surgical Treatment
Primary differential pathological considerations included a low-grade glial tumor such as a grade II or III astrocytoma or oligodendroglioma.

Treatment strategies for a lesion like this would be stereotactic biopsy, chemotherapy and radiation treatment. Surgically, depending on pathological...
diagnosis, a left frontotemporal stealth guided craniotomy and subtotal resection of the frontal and temporal part of the tumor or a left frontotemporal stealth guided craniotomy and gross total resection of the tumor by the transsylvian approach would be the options. The later approach carries the risk of weakness on contralateral side of the body (hemiparesis), total paralysis of the arm, leg, and trunk on the contralateral side of the body (hemiplegia) and the impairment of language ability (aphasia).

I determined that it was possible to remove this mass with minimal morbidity by opening the sylvian fissure widely using a meticulous microsurgical technique and paying attention to the important anatomical landmarks. Angiographic information is crucial to locating the position of the lenticulostriate arteries, which in turn is crucial to determining the extent of intraoperative surgical resection. Extending the surgical resection medial to the first lenticulostriate artery carries a significantly high risk for hemiplegia unless there is displacement by the tumor medially, which indicates no tumor extension beyond the lenticulostriate arteries. Cerebral angiography revealed that there was no displacement of lenticulostriate arteries (Fig. 2).

The patient was taken to the operating room and a left frontotemporal stealth guided craniotomy performed. The sylvian fissure was opened widely and the first distal lenticulostriate artery was located. By paying attention to the anatomical landmarks and using stealth navigation, gross total tumor resection was possible. Subsequent, pathology was consistent with an anaplastic astrocytoma.

Outcome
Postoperatively, the patient was awake, alert and oriented to person, place and time. He was able to move all extremities without weakness and there were no signs of aphasia. No physical therapy was required. The patient began chemotherapy and radiation treatment. Postoperative MR imaging confirmed gross total (more than 95%) resection of the tumor and resolution of pressure on the left lateral ventricle (Fig. 3).

For more information or to refer a patient, contact:

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Figure 2: Cerebral angiography did not reveal any arterial displacement by the tumor.

Figure 3: Postoperative MR imaging reveals gross total (more than 95%) resection of the tumor and resolution of pressure on the left lateral ventricle.