Transulcal Parafascicular Minimally Invasive Approach for Surgical Management of Brain Abscesses

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Cerebral Abscesses are a collection of infectious material within the brain parenchyma. Most arise from hematogenous spread followed by direct seeding; no source is identified in up to 25% of cases. Surgical drainage of abscess contents is advised when: no source can be identified, failure of medical management, or where there is significant neurological deficit, edema or risk of rupture into the ventricular system.
Methods

This is a retrospective case review to describe a transulcal parafascicular approach to a right atrial subependymal abscess.
An 86 year old male presented after being found down for 3 days following a fall secondary to acute onset left-side weakness. The patient was GCS 15 but encephalopathic on arrival with rhabdomyolysis and leukocytosis of 22,000. Workup revealed a right periatrial mass with central diffusion restriction and rim enhancement on MRI with a thin wall between the presumed abscess and ventricle. The patient underwent minicraniotomy and drainage with a navigated tubular retractor via a right parietal approach using diffusion tensor imaging to plan the surgical path. Cultures were positive for streptococcus anginosus. Workup revealed pneumonia as the primary source. The patient was treated with aggressive antibiotic therapy and discharged to inpatient rehabilitation secondary to his left hemiparesis. Clinical follow up showed improved left hemiparesis and no acute surgical complications. Repeat imaging demonstrated a resolved abscess.
Results

Preoperative MRI Brain demonstrating a subependymal abscess along the right atrium on DWI (top left), T2 (top right), T1 (bottom left), and T1 post-contrast (bottom right).
Results

Postoperative MRI Brain after translucal parafascicular approach to resect the subependymal abscess along the right atrium with T2 (left), T1 (center), and T1 post-contrast (right) images.
Optimal treatment for cerebral abscesses is surgical drainage and antibiotic therapy. Successful treatment with medical therapy alone has been reported. Surgical options include direct open drainage, stereotactic needle drainage, and navigated catheter drainage. We report the use of a navigated tubular retractor for surgical management. This approach was used to minimize damage to structures that may be at risk through a larger craniotomy. Stereotactic drainage was considered but given the thin rim of tissue between the abscess and ventricle, the authors felt direct visualization was more desirable.