Transcranial approach for thrombectomy of cerebral venous sinus thrombosis

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Disclosures

• The authors have no disclosures.
Introduction

• Cerebral venous sinus thromboses are an uncommon cause of stroke and typically present with nonspecific symptoms (headache, nausea, vomiting).

• Approximately 0.004-0.01% of pregnancies are complicated by cerebral venous sinus thromboses.¹

• Management:
  • Anticoagulation
  • Thrombolytic administration
  • Mechanical thrombectomy +/- intrasinus thrombolitics
Methods

• Case Report
  • HPI: A 37-year-old woman in her fourth week of pregnancy presented with a severe headache, neck pain, left arm weakness, and left sided tongue numbness.
  • She had a nine-month history of worsening headache and a miscarriage three months prior.
  • A Head CT was ordered in an attempt to determine the cause of her symptoms.
Hospital Course

Head CT and Brain MRI demonstrating superior sagittal sinus (SSS) thrombosis. The patient was admitted and underwent IV heparin therapy. She was also scheduled to undergo magnetic resonance venography to further evaluate the degree of clot burden.
Hospital Course

- MRV demonstrating thrombosis with near complete obstruction of flow throughout the SSS, left transverse sinus, and sigmoid sinus. Thrombosis was also present in the right transverse and sigmoid sinus with partial obstruction of flow. Multiple collateral draining veins were also noted to be draining from the inferior right sigmoid sinus.

- The patient’s neurologic exam deteriorated acutely and she became obtunded.
Treatment

• She underwent burr hole craniotomy on Day #4 with direct SSS cannulation and thrombectomy via antegrade approach.

• A 6-French vascular sheath was placed in the SSS and an AngioJet catheter was used to infuse tPA PulseSpray and perform a thrombectomy throughout the SSS, right transverse sinus and superiormost sigmoid sinus.

• Balloon angioplasty was also performed to restore patency to the right sigmoid sinus.

Angiography demonstrating R internal jugular occlusion

Angiography demonstrating inferior L sigmoid sinus occlusion

Direct SSS cannulation demonstrating SSS thrombus

Venous phase angiography demonstrating SSS, bilateral transverse, sigmoid sinus thromboses
Treatment

- A 0.035 wire was advanced via the left transverse sinus, resulting in mild improvements in patency.
- A catheter was unable to be advanced through the left transverse sinus, preventing complete restoration of flow.
- Thrombin-soaked Gelfoam was placed over the micropuncture site in the SSS.
- The patient made a full recovery with no lasting neurological deficits.
Discussion

• Three other cases of burr hole craniotomy for mechanical thrombectomy
  • Lee et al.\textsuperscript{2} - craniotomy over SSS with partial thrombectomy of SSS and right transverse sinus thrombosis requiring prolonged catheter placement
  • Chahlavi et al.\textsuperscript{3} - craniotomy over confluence of sinuses with thrombectomy of straight sinus thrombosis
  • Chahlavi et al.\textsuperscript{3} - craniotomy over SSS for thrombectomy of SSS and left transverse sinus thrombosis

• Our case
  • Varying degrees of thrombosis involving SSS, bilateral transverse and sigmoid sinuses
  • Complete restoration of flow through the SSS, right transverse and right sigmoid sinus (via collaterals)
  • Partial improvement in patency of the left transverse and left sigmoid sinus
Summary Points

• Cerebral venous sinus thromboses can be difficult to diagnose and often present with nonspecific symptoms.
• Medical anticoagulation is the first line of treatment.
• Endovascular thrombolysis and mechanical thrombectomy can also be utilized.
• Mechanical thrombectomy is traditionally performed via femoral vein or internal jugular vein access.
• Burr hole craniotomy is an effective alternative that may be utilized by the experienced neurosurgeon if the traditional therapy is unsuccessful.