Infectious Intracranial Aneurysms: Collaboration for Treatment Success

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Infectious Intracranial Aneurysms: Collaboration for Treatment Success

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Abstract

Infectious intracranial aneurysms, formerly known as mycotic aneurysms, are rare but carry a high morbidity and mortality. Patients present with neurological deficits seen in other common neurologic emergencies: headache, confusion, seizure, cranial nerve palsies, or hemiparesis.

Upon further investigation, many of these patients experienced systemic symptoms such as fever, malaise, and weight loss in the weeks leading up to presentation.

What sets these aneurysms apart from the others? With early identification and initiation of antibiotics, these aneurysms may reverse without invasive treatment.

Using a clinical case presentation, the pathophysiology, diagnostic work-up, and treatment options, including the controversy surrounding treatment, will be discussed. Nursing interventions to support treatment will be discussed.

Collaborative care will be emphasized as many specialists are needed to weigh in regarding appropriate timing of treatment.

Objectives

- Discuss the clinical presentation of patients with infectious intracranial aneurysms
- Discuss current treatment for infectious intracranial aneurysms

References:

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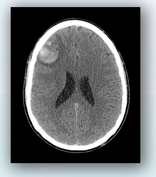
Infectious Intracranial Aneurysms

- Commonly caused by subacute bacterial endocarditis resulting in circulation of infected emboli
- Emboli lodge in vasa vasorum of cerebral arteries, causing intense inflammation of media adventitia and weakening the vessel leading to aneurysm formation
- Systemic symptoms: malaise, fever, weight loss
- Neurologic symptoms: headache, confusion, seizure, meningitis, aphasia
- Risk Factors: rheumatic heart disease, prosthetic heart valves, dental procedures/tooth abscess, nosocomial bacteremia, mitral or aortic valve insufficiency/stenosis, IV drug use
- Incidence: 2-6%, probably underestimated- some may be asymptomatic and resolve spontaneously, others may rupture prior to receiving medical attention

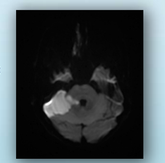
Case Presentation

- 42 y.o. Right-handed male presents to ED after suffering witnessed generalized tonic-clonic seizure at work
- Emergent CT head: Right Frontal Acute Hematoma
- Postictal confusion cleared and remainder of neurologic exam unremarkable



Past Medical History

- MVA at age 7 with left patellar fracture, right shoulder injury, questionable spleen laceration
- Kidney infection due to pyelonephritis
- Diagnosed with cerebellar stroke (Right PICA) 23 days prior to admission. Diagnostic work-up significant for bicuspid aortic valve with a large vegetation on ventricular side. Discharged on 6 weeks of IV antibiotics prior to planned aortic valve replacement surgery.



Diagnosis

- Initial MRA negative for aneurysm noting limits of study for small aneurysms
- Cerebral angiogram indicative of small mycotic aneurysm involving right frontal and adjacent branch of distal MCA circulation

Treatment

- Controversy exists due to lack of randomized controlled trials
- Conservative treatment with antibiotics alone or in combination with surgical and/or endovascular treatment
- Unruptured: serial angiography to demonstrate resolution
- Ruptured: poor prognosis with antibiotics alone; timing issue due to friable aneurysm; endovascular approach may lead to sacrifice of parent vessel

Back to our Patient...

- Due to 2nd CVA, indication for surgery strengthened; risk of ICH while on cardiopulmonary bypass for valve replacement surgery main concern
- Tissue vs. mechanical valve in setting of infection
- Underwent successful aortic valve replacement with bioprosthesis on hospital day 9
- Discharge home to finish course of IV antibiotics on hospital day 13

Collaborative Approach

- Timing is everything…
- Specialists involved: Neurology, Neurosurgery, Neurointerventional Radiology, Infectious Disease, Cardiology, Cardiothoracic Surgery, Pulmonary Critical Care
- Completing the team: Nursing, Case Management, Cardiac Rehab, Pastoral Care, Child-Life Specialist (when his children visited)

Nursing Considerations

- Careful monitoring of vital signs and neurologic status
- Management of symptoms (fever, headache, nausea, photophobia, compensating for deficits)
- On-going education and reassurance for patient and family
- Keeping everyone on the same page