Refractory ICP with Mycotic Aneurysm – 23.4% Saline or Mannitol?

Madam,

Mycotic aneurysms (MAs) account for approximately 3% of all aneurysms and require prompt recognition by the clinician to ensure appropriate medical and surgical management. Intracerebral MAs can occur in 2%–3% of cases of infective endocarditis with intracranial MAs accounting for 0.7%–6.5% of all intracranial aneurysms.[1] A ruptured MA carries a mortality rate of 80%.[1] Management of a ruptured MA necessitates emergent surgery with close monitoring of intracranial pressure (ICP) in the intra-operative and postoperative period.[2,3]

This case describes a young male with a medical history significant for congenital heart disease with aortic valve stenosis, aortic valvulotomy, and coronary artery bypass graft who presented to the intensive care unit with acute altered mental status. Before his hospitalization, the patient was involved in a low-impact mountain biking accident resulting in multiple cutaneous abrasions. Several days later, he was admitted to the hospital with Staphylococcus aureus bacteremia and subsequent aortic valve infective endocarditis. Sequelae included septic emboli causing mental status and vision changes, skin lesions, acute kidney injury, and hypoattenuating splenic infarcts [Figures 1 and 2].

During his hospitalization following several days of antibiotic therapy, the patient was noted to be acutely unresponsive. A computerized tomography (CT) scan of the head demonstrated a 4-mm MA with left frontoparietal intracerebral hemorrhage. The patient underwent urgent hemiepithroectomy, hematoma evacuation, MA clipping, and ventriculostomy drain placement. The evening following surgery, the patient remained unresponsive. He continued to have rising ICPs greater than 30 mmHg. Aggressive measures including hyperosmolar 3% saline infusion and 23% saline boluses were then attempted.

With this case, we outline a unique presentation of endocarditis in a young male with previous aortic valvulotomy and single-vessel coronary artery bypass graft resulting in cerebral MA rupture. We also present a rare management strategy for refractory elevation in ICP using 23.4% saline. Traditional medical management of increased ICP includes mechanical hyperventilation, osmotic diuresis with mannitol, barbiturate coma, and drainage of cerebrospinal fluid (CSF).[4] When these measures fail, a few case reports have outlined the use of 23% and 29% saline with sustained reduction in ICP.

Suarez et al. studied a population of 20 patients with increased ICP who failed standard therapy including the use of mannitol. Eight of these patients received 23.4% saline with immediate reduction in ICP by more than 50% sustained for a duration of 6 h. Side effects of 23% saline include central pontine myelinolysis, subdural hematomas, congestive heart failure, electrolyte abnormalities, and coagulopathy.[4]

Kerwin et al. compared 23.4% saline with mannitol in 22 patients with elevated ICP after traumatic brain injury. ICP was reduced by 9 mmHg in the 23.4% saline group as opposed to 6 mmHg in the mannitol group. In addition,
the response rate to 23.4% saline was 92.6% compared with 74% for the mannitol group. The retrospective analysis concluded that saline is more efficacious than mannitol for reducing ICP and may become a first-line agent in treatment of this condition. The use of 23.4% saline is an effective way to lower ICP in patients who are refractory to standard management.

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There are no conflicts of interest.

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