Insidious Development: Cerebral Mycotic Aneurysm in an Immunocompromised Patient

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Abstract
Mycotic aneurysms are microinfections of a cerebral artery occurring secondary to infectious endocarditis or central nervous system infection. They are usually discovered only after rupture, which is often fatal.

Keywords: cerebral mycotic aneurysm, immunocompromised, methicillin-sensitive staphylococcus aureus

Case
Forty-four-year-old male with a past medical history of hypertension, gout, and rheumatoid arthritis on methotrexate presents with encephalopathy and fever for 1 day. Three months earlier, he had tenosynovitis/osteomyelitis treated with 6 weeks of intravenous antibiotics. Physical examination showed effusions in bilateral olecranon bursae, knees, and ankles (Figure 1). He was confused and lethargic. Methotrexate was stopped, and empiric therapy was started for bacterial meningitis. CSF and blood cultures were positive for methicillin-sensitive Staphylococcus aureus (MSSA). He underwent multijoint aspiration and drainage of joints and bursae. Synovial fluid was positive for MSSA.

He was admitted for management and further workup. Echocardiography was negative for valvular vegetations. Liver function deteriorated, and he developed jaundice. Investigations did not reveal biliary obstruction, hemolysis, or hepatitis. Folic acid was initiated for concern of methotrexate toxicity.

He continued to experience fluctuating mental status. Magnetic resonance (MR) imaging of the brain revealed multiple hyperintense lesions concerning meningitis and soon he required norepinephrine and hemodialysis. The patient then became obtund with a fixed and dilated left pupil. Computed tomography (CT) of the head revealed a large parenchymal hematoma in the left frontoparietal lobes with subfalcine/uncal herniation likely caused by a mycotic aneurysm (MA;
Insidious Development

Figure 1. Effusion and drainage of right ankle.

Figure 2. Computed tomography of the head axial and coronal planes revealing a large parenchymal hematoma showing subfalcine and uncal herniation.

Figure 2). He was not considered a surgical candidate and was transitioned to comfort care.

Discussion

This is a rare example of a MA caused by meningitis rather than infective endocarditis (IE). There is an established relationship between immunocompromised individuals with IE or central nervous system (CNS) infections developing MA compared with immunocompetent individuals with similar infections.1 Our patient was immunocompromised secondary to methotrexate therapy.

The most common presentation of MA is rupture and hemorrhage with a mortality rate of 80%.2 It is not uncommon for a MA to rupture weeks or months after the inciting infection has been treated.2 Screening certain individuals for MA should be considered, particularly for those patients with IE or CNS infections who are also immunocompromised. There is no standard of care to treat MA currently because of the lack of clinical trials. Strategies include diagnosis with CT or MR angiography followed by antibiotics.4 If the diagnosis is clear surgical options include aneurysm excision ± vascular reconstruction.5 More research is needed for a better definition and validation of screening strategies for this life-threatening diagnosis.

References

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