CLINICAL VIGNETTE

Rheumatoid Meningitis: A Rare Manifestation of Rheumatoid Arthritis

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Case Presentation

An 84-year-old female with nodular seropositive rheumatoid arthritis (RA), COPD, CAD presented to the emergency department after several weeks of intermittent right arm and right leg weakness. She was diagnosed with RA over 10 years ago with involvement of the hands and knees. Her rheumatologist recommended disease-modifying antirheumatic drugs but the patient declined due to her concern about side effects and only took acetaminophen for joint pain. At baseline, her Rheumatoid Factor was 30 IU/mL, anti-CCP was >200 IU/mL.

On arrival to the emergency department, her vital signs were T 37.3, HR 73, BP 144/73, RR 18, SpO2 95% on room air. Neurological exam was notable for right upper extremity and right lower extremity strength 4/5 and intermittent aphasia. Brain MRI revealed abnormal enhancement of the leptomeninges involving the entire left hemisphere (Figure 1). She underwent a lumbar puncture notable for lymphocytic pleocytosis: CSF WBC 14 /μL (12% neutrophils, 68% lymphocytes, 20% monocytes), protein 58 mg/dL, and glucose 57 mg/dL. EEG showed left hemispheric spikes, suggesting irritability. The patient and her family declined a dural brain biopsy.

She was empirically started on intravenous vancomycin, ceftriaxone, and acyclovir, but these were discontinued once the CSF culture revealed no growth and the CSF HSV PCR was not detected. The remainder of her extensive infectious evaluation was negative including: blood culture, HIV screen, serum cryptococcal Ag, serum RPR, serum CMV and EBV PCR. Her rheumatologic testing included: C3 136, C4 36.1, ANA negative, dsDNA <1, anti-Smith negative, anti-SSA negative, and anti-SSB negative.

During her hospital course, her mental status declined with worsening confusion, aphasia, and attentiveness. In addition, her right sided hemiparesis waxed and waned. On occasion her RUE strength was only 2/5. Repeat MRI brain imaging revealed no evidence of stroke and ongoing enhancement of the left hemisphere meninges. Given her negative infectious work up and history of long-standing RA, there was concern for rheumatoid meningitis.

Neurology, rheumatology and infectious disease were consulted. She was treated with methylprednisolone 250 mg intravenously daily for 3 days, and then decreased to methylprednisolone 16 mg intravenously every 8 hours. On discharge, she was transitioned to prednisone 60 mg po daily. She was offered treatment with rituximab or cyclophosphamide, but the patient declined given her marked improvement with steroids alone. By the time of discharge, her mental status improved to baseline, her right hemiparesis resolved, and she was discharged to a skilled nursing facility.

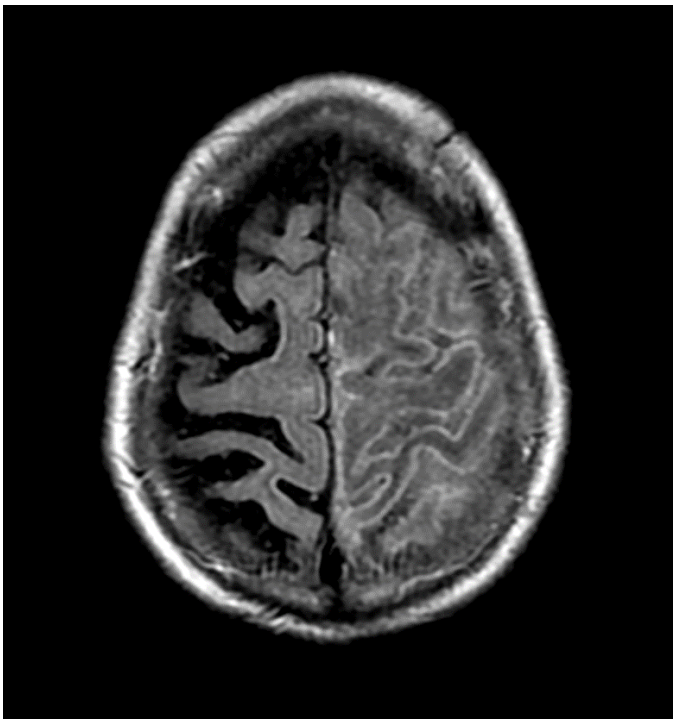

Figure 1. Diffuse cortical leptomeningeal hyperintensity on T2 FLAIR sequence throughout the left frontal and parietal lobes compatible with leptomeningitis.

Discussion

Rheumatoid meningitis is a rare complication of RA and should be suspected in a patient with longstanding RA presenting with new neurological symptoms.[1] Symptoms of Rheumatoid meningitis are broad including headache, hemiparesis, cognitive impairment, cranial nerve abnormalities, and seizures. As seen with this patient, Rheumatoid meningitis often affects only 1 hemisphere resulting in asymmetric meningitis.[2] MRI brain findings reveal unilateral meningeal thickening and leptomeningeal enhancement.[3] CSF results are consistent with aseptic meningitis with a mild lymphocyte predominant pleocytosis and slightly elevated protein. Our patient declined

meningeal biopsy. However, meningeal biopsies in Rheumatoid meningitis are useful as they often reveal necrotic granulomatous inflammation, perivascular lymphocytes and histiocytes, as well as rheumatoid nodules.[4]

Given that symptoms for Rheumatoid meningitis are not specific to the disease, it is important to keep a broad differential. The differential diagnosis for Rheumatoid meningitis includes stroke, bacterial or fungal meningitis, vasculitis, IgG4 related disease, tuberculosis, neurosarcoidosis, and meningeal carcinomatosis. CSF findings can help to narrow this differential, although aseptic meningitis can be caused by many different disease processes. An extensive infectious evaluation is needed to rule out bacterial (including mycobacteria), viral, or fungal infections prior to initiation of treatment for Rheumatoid meningitis.

There are no evidenced based guidelines on the treatment of Rheumatoid meningitis. In general, per review of case reports and the literature available, patients are typically treated with pulse dose steroids for 3 days, and then a prolonged steroid taper. There are some case reports of successful outcomes with the use of rituximab, azathioprine, methotrexate or cyclophosphamide under the guidance of a rheumatologist.[5] A thorough infectious work up should be exhausted prior to the initiation of steroids treatment given that patients with RA are often on immunosuppressant medications and thus are at higher risk for opportunistic infections.

In summary, Rheumatoid meningitis is an uncommon disorder, which manifests as new neurological symptoms (headache, hemiparesis, seizures, aphasia, confusion). MRI findings often reveal asymmetric leptomeningeal enhancement, but this is not pathognomonic as both hemispheres can be involved. It is critical that clinicians keep Rheumatoid meningitis in the differential of a patient with a history of RA and new neurologic symptoms. Extensive infectious work-up is still required prior to initiation of treatment with pulse dose steroids and immunologic therapy.

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