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Recurrence of Disseminated *Mycobacterium avium intracellulare* Presenting as Spondylodiscitis and Epidural Abscess in a Patient with Acquired Immune Deficiency Syndrome (AIDS)

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Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Patient: Male, 65-year-old
Final Diagnosis: *Mycobacterium avium intracellulare* epidural abscess
Symptoms: Back pain • flank pain
Medication: —
Clinical Procedure: Debridement • evacuation of epidural abscess • laminectomy
Specialty: Infectious Diseases • Neurosurgery

Objective: Unusual clinical course

Background: *Mycobacterium avium intracellulare* complex (MAI) is a member of the non-tuberculous mycobacteria family, which can cause both pulmonary and non-pulmonary disease. In patients with advanced HIV, it is known to cause disseminated disease. We present a case of a 65-year-old man who has sex with men (MSM) with AIDS, found to have spondylodiscitis and an epidural abscess, who had recently completed treatment for disseminated MAI.

Case Report: The patient was a 65-year-old with AIDS secondary to HIV and a prior history of disseminated MAI, who presented with severe back pain. Upon presentation to the hospital, an MRI was performed, which was suggestive of spondylodiscitis and an epidural abscess. He was taken to surgery for a minimally invasive T12-L1 laminectomy and evacuation of the epidural abscess. Both traditional cultures and acid-fast bacillus (AFB) cultures were negative. Due to worsening pain, he was taken back to surgery for a repeat debridement and biopsy. Repeat cultures were positive for MAI. He was started on rifabutin, ethambutol, azithromycin, and moxifloxacin. Moxifloxacin was subsequently discontinued. He has had problems tolerating the treatment regimen, but is planned to complete an 18-24-month course.

Conclusions: For patients with AIDS who have a diagnosis of spondylodiscitis and an epidural abscess, an opportunistic infection such as MAI should be considered. A repeat biopsy should be considered if suspicion is still high, even despite initially negative cultures. Treatment regimens should be prolonged, despite difficulty with medication compliance.

Keywords: Epidural Abscess • HIV • Mycobacterium Infections, Nontuberculous

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/931595

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Background

Disseminated MAI is a clinical diagnosis which is distinctive from pulmonary MAI, both in terms of risk factors and clinical presentation [1,2]. Pulmonary MAI often occurs in both immunocompetent and immunosuppressed patients, and structural lung disease is a risk factor [1]. Disseminated MAI tends to occur in those with profound immunosuppression [1]. Patients with AIDS, particularly those with a CD 4 <50 cells/uL, are at high risk for disseminated MAI [2]. In such patients with advanced immunosuppression, MAI disease often is a disseminated, multi-organism infection [2]. Disseminated non-tuberculous mycobacteria (NTM), including MAI, have been documented to cause vertebral osteomyelitis, particularly in immunocompromised patients [3-5]. Here, we present a case of a 65-year-old MSM with a history of AIDS who was found to have spondylodiscitis and an epidural abscess secondary to recurrent and disseminated MAI.

Case Report

In October 2019, our patient presented to the Emergency Department with a chief concern of progressive low back pain which had developed over the preceding 2 weeks. He had initially been diagnosed with HIV and AIDS in 1984; since then, he had been intermittently compliant with antiretroviral therapy, with lapses while struggling with depression. He moved from Florida to Michigan in 2015. Prior to 2015, his history included HIV wasting syndrome, Kaposi's sarcoma, oral candidiasis, and chronic kidney disease stage 3 due to tenofovir, arterionephrosclerosis, and hepatitis C, which has since been treated. He had been off antiretroviral therapy from 2012 to 2015 due to a lack of follow-up.

He was previously diagnosed with pneumocystis pneumonia in May 2015 and had acid-fast bacillus (AFB) blood cultures turn positive after discharge. During this period, he moved from Florida to Michigan in September 2015, and repeat AFB blood cultures were negative. As previous records were not initially available at the time of presentation in August 2015, he was re-started on anti-retroviral therapy and prophylactic azithromycin for MAI prophylaxis in accordance with previous guidelines, as his CD4 count was <50 cells/uL [6]. After his CD4 count had increased to over 100 cells/uL, the azithromycin was discontinued. Over the last 2 years prior to this admission, his CD4 count had fluctuated from 75 to 190 cells/uL, and was rarely above 200 cells/uL. It had risen from 91 cells/uL to 206 cells/uL over the previous 6 months. Current antiviral regimen included darunavir-cobicistat (800 mg and 150 mg, respectively) daily, dolutegravir 50 mg daily, and lamivudine 100 mg daily. He had previously been on tenofovir, but this was discontinued due to a rising creatinine level. Abacavir was also contraindicated, given that he was HLA-B5701-positive [7]. He was also prescribed dapsone 100 mg daily for pneumocystis prophylaxis, but not trimethoprim-sulfamethoxazole due to his elevated creatinine level.

Since moving to Michigan, he had been compliant with his medications until late 2017. At that time, he presented again for pneumocystis pneumonia and tested positive again for MAI. Given his improving clinical status and negative repeat test in December 2017, treatment was again deferred. In June 2018 he developed hypercalcemia. Although his repeat test was negative, there was a high suspicion that disseminated MAI and possibly related granulomatous diseases was likely the cause of his hypercalcemia. Thus, he was started on azithromycin 500 mg daily and ethambutol 800 mg daily. The isolate for mycobacterium avium complex was tested for susceptibility and was found to be macrolide-susceptible. A 2-drug regimen was prescribed based on CDC/NIH/HIVMA guidelines for patients with CD >50 cells/uL and low levels of bacteremia (based on negative repeat cultures) [6]. A 3-drug regimen was considered, but deferred due to his history of medication non-compliance. The hypercalcemia resolved and he completed a 12-month course of 2-drug therapy for MAI.

Just prior to his admission, he reported back pain prior to an anal biopsy, which found several high-grade squamous intraepithelial lesions. The biopsy was performed secondary to ASCUS (atypical squamous cells of undetermined significance) on a screening anal PAP exam. There was no reported history of trauma. He denied fever, chills, night sweats, trauma, and bowel or bladder incontinence. He admitted to new-onset flank pain. He was afebrile and normotensive with a BMI of 25. The exam showed a chronically ill-appearing man with intact strength and sensation in bilateral lower extremities, 2+patellar and 1+ankle reflexes bilaterally, as well as point tenderness at T12-L1. Pertinent labs include WBC 8500 uL (4500-11 000 uL), Hgb 12.2 g/dL (14-18 dL), MCV 100.2 fL (80-100 fL), Creatinine 1.6 mg/dL (baseline 1.6-1.8mg/dL, normal range 0.7-1.2 mg/dL), ESR 102mm/h (0-20 mm/h), and CRP 2.1mg/dL (<0.5 mg/dL). An MRI spine screen was performed, demonstrating a new pathologic T12 fracture, marrow edema of T12-L1 vertebral bodies and intervertebral disc, suggesting spondylodiscitis, and a ventral epidural abscess at T12-L1 (**Figure 1**). He was started empirically on intravenous ceftriaxone and vancomycin, which was administered before blood cultures were collected. He was subsequently admitted to the hospital with Infectious Disease and Neurosurgery consultations.

His admission blood cultures remained negative. Due to worsening pain and for diagnosis, the patient underwent minimally invasive right T12-L1 laminectomy/medial facetectomy and evacuation of epidural abscess. Postoperatively, ceftriaxone and vancomycin were continued. Surgical cultures collected

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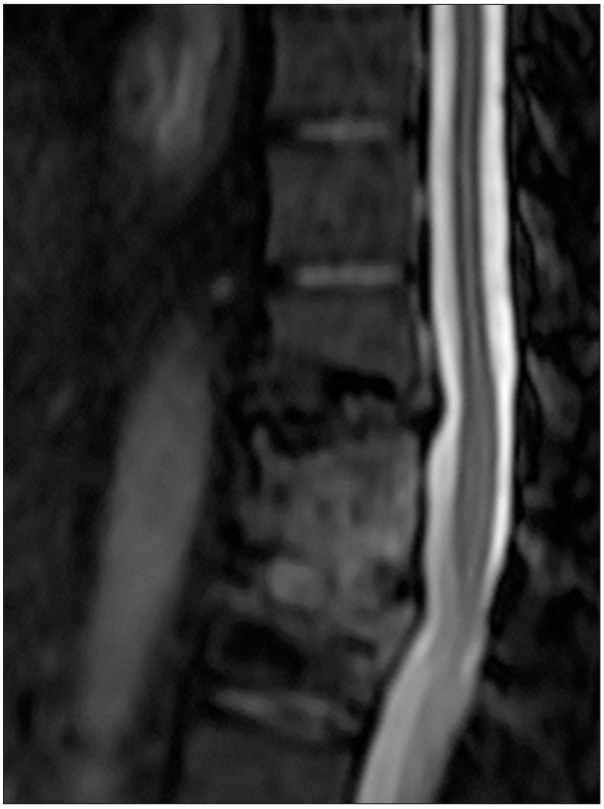

Figure 1. MRI demonstrating T12-L1 vertebral osteomyelitis and epidural abscess.

intraoperatively, including AFB cultures, were negative, and the biopsies taken were non-diagnostic, only showing necrotic tissue with rare neutrophils. Brucella testing was not performed due to low suspicion and a lack of exposure history. During this time the patient continued to have significant back pain and was not improving clinically. Secondary to cultures being negative, antimicrobial therapy was stopped for 7 days to optimize culture yield and he then underwent left a T12-L1 open laminectomy with resection of epidural tissue and extensive T12, L1 vertebral body sampling, T12-L1 interspace sampling with T11-L3 and onlay fusion, and T11-L3 pedicle screw fixation. The repeat biopsy demonstrated necrotizing granulomatous inflammation (**Figure 2**) and the AFB culture grew MAI.

In terms of a workup for further dissemination, a CT abdomen and pelvis, performed secondary to his flank pain, was suggestive of a large calculus at the right ureteropelvic junction without hydronephrosis. The calculus was managed medically without urologic intervention. He also had an esophagogastroduodenoscopy due to melena, which was diagnostic for a hiatal hernia, gastritis, gastric erosions, esophagitis, and esophageal ulcer. The biopsy was negative for candida, CMV, and HSV esophagitis.

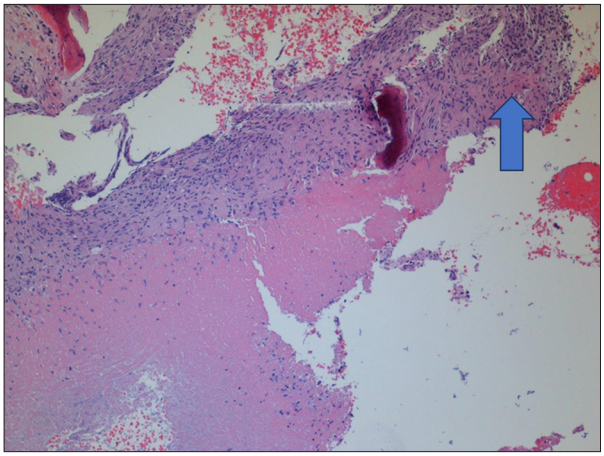

Figure 2. Necrotizing granulomatous inflammation.

Treatment

We presumed the possibility of tuberculosis or resistant MAI, and thus patient was started on isoniazid 300 mg daily, azithromycin 500 mg daily, ethambutol 800 mg daily, moxifloxacin 400 mg daily, and rifabutin 300 mg daily, pending antimicrobial sensitivities, and was continued on previously prescribed dapsone and his antiviral regimen. An AFB culture was positive for MAI, but the isolate was deemed non-viable for susceptibility testing. Upon identification of MAI, the isoniazid was discontinued. The patient initially did not tolerate this initial regimen, developing refractory nausea and vomiting, believed to be secondary to rifabutin, which was discontinued and subsequently resulted in symptom resolution. Within a few more weeks, he again developed refractory nausea and vomiting, at which time moxifloxacin was stopped, again with resolution of symptoms. Out of the desire to have the patient on a 3-drug regimen, 1 month later rifabutin was resumed at a lower dose and to date this regimen has been tolerated well. He has continued on azithromycin 500 mg daily, ethambutol 800 mg daily, and rifabutin 150 mg 3 times per week.

Discussion

MAI is found in water and soil environments, with water being the main source of infection due to innate chloride resistance [2]. The pathogenesis of MAI in AIDS patients is believed to be secondary to gastrointestinal colonization and subsequent invasion across the mucosa and submucosa [2]. The present patient had a history of disseminated MAI, likely secondary to his immunosuppression from AIDS. Macrolide-based treatment courses for at least 12 months have been successful in several case series, particularly with recovery of CD4 cell counts [8-10]. Although rare, relapses have been documented, including one case with osteomyelitis [9]. Despite being treated for 12 months, we believe he likely had residual infection

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which presented as spondylodiscitis and an epidural abscess. Complicating his course was an inability of his CD4 cell count to consistently rise >200 cells/uL.

Mycobacterium avium complex has been documented to cause spondylodiscitis, both in HIV and non-HIV patients [3-5]. Among mycobacteria, *Mycobacterium tuberculosis* has been well-documented to cause spondylodiscitis [10]. Other cases of NTM include *M. xenopi, M. abscessus, M. chelonae, M. fortuitum, M. kansasii, M. siniae,* and *M. flavescens* [3]. The majority of these cases were either immunocompromised or on immunosuppressive medication, including steroids [3-5]. One series noted that 14.5% of patients with NTM vertebral osteomyelitis were positive for HIV [3]. Immune reconstitution may contribute to diagnosis of spondylodiscitis, as patients were diagnosed an average of 12.5 months from initiation of antiretroviral therapy [3]. We speculate that immune reconstitution may have contributed to his presentation, given that his CD4 had risen steadily over the previous 6 months. Complicating factors for our patient included intermittent compliance with his antiretroviral therapy. An epidural abscess is an even rarer complication of disseminated MAI [3]. It has been previously documented in *M. tuberculosis* [12].

Diagnosing spondylosicitis and epidural abscess frequently requires a surgical biopsy, particularly if blood cultures are negative for *Staphylococcus aureus, Staphylococcus lugdunensis,* or *Brucella* [13]. In the case of this patient, his blood cultures, which were drawn after antibiotics were initiated, were negative. Previous cases of MAI spondylosicitis frequently required a surgical biopsy, with AFB cultures being the primary diagnostic test [3,4]. Given the high suspicion for an opportunistic pathogen, the patient was taken to the operating room for a biopsy, including AFB and fungal cultures, and drainage of the epidural abscess. Due to negative cultures and the patient's lack of improvement, he was taken back to surgery for a second biopsy and drainage of the abscess. A few cases in the medical literature required 2 biopsies, but at least 1 case was secondary to a lack of initial AFB cultures due to low suspicion [4].

In terms of treatment, the Infectious Diseases Society of America treatment guidelines recommend 3-drug therapy for pulmonary disease, with a strong emphasis on a macrolide and ethambutol [14]. Similarly, treatment for disseminated MAI, which this likely represents, often may include rifampin, rifabutin, clofazimine, fluoroquinolones, and aminoglycosides [2,6]. This patient was previously treated with 12 months of therapy for MAI. Previously successful regimens for vertebral osteomyelitis were similar to those prescribed for disseminated MAI [3,4]. NTM spondylodiscitis patients improved in approximately 80% of cases [3]. A case review of 16 non-HIV vertebral osteomyelitis secondary to MAI found that 68.8% of patients improved with therapy [4], with a mean duration of 16.8 months.

Our patient had difficulty tolerating rifabutin and, subsequently, moxifloxacin. We did not use rifampin due to potential drug-drug interactions with the protease inhibitor. As previously noted, he has been on darunavir-cobicistat, dolutegravir, and lamivudine for antiretroviral therapy. After considerable encouragement, he resumed the rifabutin and has mostly been compliant, but has had lapses in his MAI therapy. Based on our previous literature review [4], we opted to continue him on 3-drug therapy for his spondylosicitis and epidural abscess. Given that he relapsed despite 12 months of therapy and intermittent compliance, we will aim to treat him for at least 18-24 months.

Conclusions

Our patient with AIDS and disseminated MAI presented with spondylosicitis and an epidural abscess and required a second biopsy procedure to confirm the diagnosis. He improved with irrigation and drainage of the abscess and continues to do well on 3-drug therapy with azithromycin, rifabutin, and ethambutol.

Declaration of Figures Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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