

Non-Tuberculosis Mycobacterium Avium Complex in a Patient with Human Immunodeficiency Virus

Megan Macvicar, PA-S, Susan McDiarmid, EdD, MS, PA-C

Westfield State University
Physician Assistant Program



Case

24 year old male with no known medical history presented to the emergency department with a painful anterior neck mass that had progressively enlarged over the previous month. Pain was intermittent, non-radiating, 4/10 in intensity, and relieved with NSAIDs. On presentation, there was no leakage from the mass, but eventually serosanguinous fluid drained after repeated manipulation from himself and his partner. He noted associated unintentional weight loss of 6.5 pounds in the last month and a total of 20 pounds in the past two months.

For review of systems, he denied fever, night sweats, difficulty breathing, dysphagia, chest pain, headaches, or blurry vision.

Patient reported no past medical history, no past surgical history, and takes no medications. No pertinent family history. Pertinent social history includes one sexual partner who is HIV-1 positive. Denies tobacco use, alcohol use, or recreational drugs.

Upon admission, the patient reported exposure to HIV for the past year due to intercourse with his partner that was HIV positive. He was subsequently found to be HIV-1 positive with a CD4 count of 206 cells/mm³ and a viral load of 241,000 copies/mL. He was immediately started on Biktarvy in the hospital.

Physical Exam

Vital Signs	T: 98.4 F HR: 82 bpm RR: 18 O2: 97% BP: 122/57 BMI: 20.62
General Appearance	Appeared stated age. Well-groomed, thin male, in no acute distress.
Neurological	Alert and Oriented x3. No focal deficits. Normal gait.
HEENT	Pupils equal and round. No hoarseness noted in voice.
Neck	5 cm, mildly erythematous, tender mass noted on the central anterior neck. Mass was fixed and fluctuant with cystic consistency. No discharge observed. Right axillary lymphadenopathy greater than left.
Cardiac	Normal S1 S2. Regular rate and rhythm. No murmurs, rubs, or gallops.
Pulmonary	Lungs were clear to auscultation bilaterally. No rales, rhonchi, or wheezing. No increased work of breathing.
Abdomen	Soft, non-tender, non-distended. Normoactive bowel sounds in all quadrants.
Extremities	Warm to the touch, no pedal edema
Integumentary	Warm, dry, and intact without diaphoresis

Diagnostic Testing

IV PCR: Positive for HIV-1
HIV viral load: 241,000 copies/mL
CD4: 206 cells/mm³
Quantiferon Gold: Negative
LDH: 210 units/L (within normal limits)
ESR: 105 mm/hr (elevated)
WBC: 5.6 k/mm³
Hgb: 9.4 Gm/dL (low)
Hct: 29.3 % (low)
MCV: 92.1 femtoliters (within normal limits)

CT scan: Complex mass of the left side of the neck, superior to the mediastinum and anteriorly into subcutaneous tissue at the level of the thyroid. The thyroid itself appears normal. The mass was inhomogeneously solid with well defined walls. The mass was approximately 4.5x3.4x4.5 cm in size, with relatively mild mass effect on the left side of the neck without compromise of the vessels.

Interventional radiology:

1/3: 5 cc of tan cloudy fluid aspirate with many WBC, no organisms seen on gram stain. Negative for malignant cells.

1/7: 3 cc of gelatinous/mucus like purulent fluid sent for culture. Acid-fast bacilli positive. Culture grew non-tuberculosis mycobacterium avium complex

Diagnosis

Non-tuberculosis mycobacterium avium complex is an infection that patients that are immunocompromised are at increased risk of contracting. For the patient in this case, he was at increased risk because of exposure and subsequent infection with HIV-1.

In order to diagnose this patient, it was important to come to the diagnosis of HIV-1. With HIV viral load increased and a decreased CD4 count, it makes this diagnosis more likely. If this patient had started pre-exposure prophylaxis (PrEP) therapy against HIV due to knowledge of his partner being positive for HIV-1, the patient could have avoided contracting not only HIV, a lifelong illness, but also would avoided non-TB MAC.



Figure 1. Sagittal view of CT scan of patient's neck mass

Management

Initial treatment started antiretroviral therapy (ART). ART does not cure HIV, but allows patients to live longer by protecting against infections that those with HIV are at an increased risk of contracting. Biktarvy is an example of an ART medication. This medication is a combination of bictegravir 50 mg, emtricitabine 200 mg, and tenofovir alafenamide 25 mg. This medication is taken once daily for the remainder of a patient's life. The goal of this medication is to decrease the HIV viral load to undetectable levels. Eliminating the viral load significantly reduces the risk of transmitting the virus to partners via sexual contact. With less viral load in the body, there is less attack on the immune system, allowing for CD4 lymphocytes to increase back to normal range. This will allow for more protection against AIDS defining illnesses³.

Treating Non-TB MAC consists of prolonged course of antibiotics. The patient must take azithromycin 500 mg daily and ethambutol 15 mg/kg once daily for 12 months. Before completing the medication, the CD4 count must be above 100 for 6 months. Taking ethambutol for a prolonged amount of time requires patients to get a baseline eye exam. This is because ethambutol causes mitochondrial dysfunction in retinal ganglion cells and optic nerve axons causes optic neuritis.

Before this patient left the hospital, it was important that the patient met with infectious disease for patient education. It is critical that the patient understands his diagnosis of HIV, and what this means for lifelong treatment. Because non-TB MAC requires long term medication, he must be set up with the appropriate outpatient care to maintain treatment.

Discussion

Non-tuberculosis avium complex (Non-TB MAC) is a non-motile, non-spore forming gram positive acid fast bacilli organism¹.

This infection is most commonly found in patients that are immunocompromised. This includes patients that are human immunodeficiency virus (HIV) positive. HIV attacks the body's immune system and decreases the amount of CD4 lymphocytes. CD4 lymphocytes help the body to fight infection. The less CD4 cells a patient has, the more they are at increased risk of severe infections, like non-TB MAC. Non-TB MAC can be found in patient's with a CD4 count <50 cells/microliter and a HIV viral load >1,000 copies/mL. The rate of this type of infection has largely decreased with the use of antiretroviral therapy. Interactions with mycobacterium avium complex, HIV, and the immune system are not completely understood. It is known that contracting non-TB MAC is associated with increased mortality independent of the CD4 count.

Transmission of this infection is via inhalation or ingestion. Mycobacterium avium complexes live in the environment in water and soil. When a patient is infected with non-TB MAC, there is no isolation necessary.

Non-TB MAC presents in patients in two main forms - disseminated disease and focal lymphadenitis. Disseminated disease presents with fever, night sweats, abdominal pain, and diarrhea. Diffuse lymphadenopathy is commonly present. MAC infection will be present in blood cultures. Focal lymphadenitis will present with localized adenitis, fever, leukocytosis, focal inflammation in the cervical, intraabdominal, or mediastinal regions.

Non-tuberculosis mycobacterium avium complex is an infection that affects those that are immunocompromised. Most commonly, the bacteria infects the lungs, presenting with pulmonary findings on exam such as shortness of breath and cough. Patients may also present with non-specific symptoms such as fatigue, malaise, and weight loss.² This patient presented with extrapulmonary symptoms, with the infection manifesting in the cervical lymph node.

Non-tuberculosis mycobacterium (NTM) has 190 different species that can cause infection in humans.² The bacterium can be found in contaminated water. The infection enters the gastrointestinal tract. The infection enters the rest of the body by adherence to epithelial tissue and entering the lymphatic system.¹ In patients with HIV, disseminated disease is common.

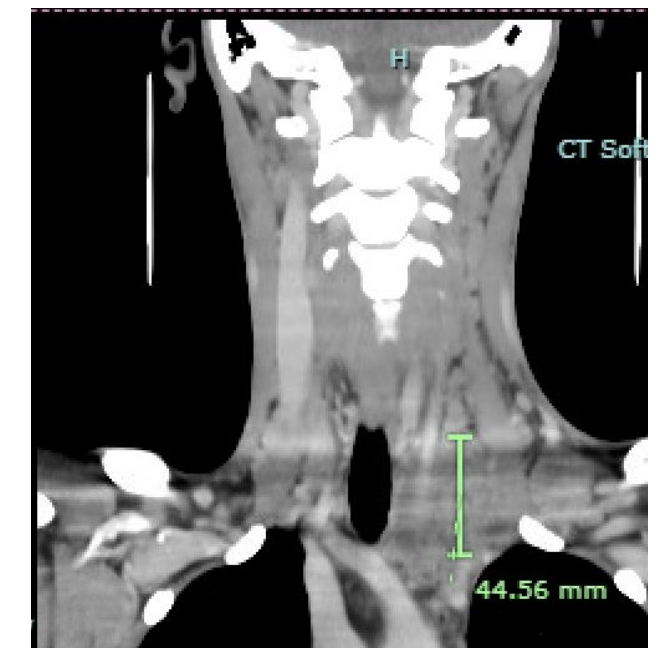


Figure 2. Frontal view of CT scan of patient's neck mass

Conclusion

Historically, there has been stigma against HIV and testing positive. This patient in particular expressed concern for testing positive with a partner that is positive, and therefore avoided testing. Had this patient gotten tested and used PrEP therapy, this infection could have been avoided.

Stigma against HIV has largely changed over time with medication that allows for those with the virus to live long lives by avoiding fatal infections. Although this may be true, patients remain avoidant with testing.

Stopping the stigma will normalize the diagnosis amongst the community. Some ways that this may be possible includes discussing HIV with peers. This allows more people to understand the virus. Discuss safe sexual intercourse and PrEP therapy. Take action against the stigma. Some ways to do this include visiting "Let's Stop HIV Together" on the Center of Disease Control website⁴.

References

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