

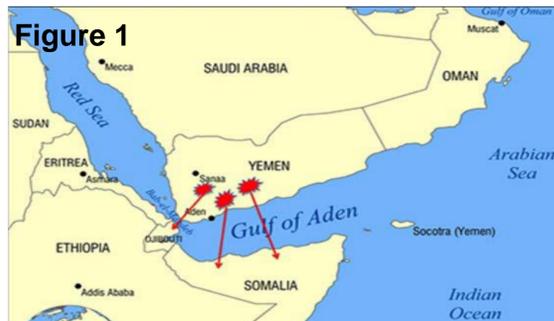
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Introduction

Mycobacterium canettii is a member of the *Mycobacterium tuberculosis* complex (MTBC) and is considered the precursor species of *Mycobacterium tuberculosis*. The organism was first reported in 1969 by a French microbiologist, Georges Canetti, for whom the organism has been named. *M. canettii* forms smooth, shiny colonies, compared to some of the other members of the MTBC which are buff and dry. Since its discovery in 1969, most of the strains have been isolated in the Republic of Djibouti (see Figure 1) in the Horn of Africa. A history of a visit to this region should trigger consideration of this strain in the differential diagnosis, especially as travel from this region has become more frequent. The Michigan Department of Health and Human Services identified a case of *M. canettii* in 2016 from a patient seen at a southeastern Michigan Hospital.

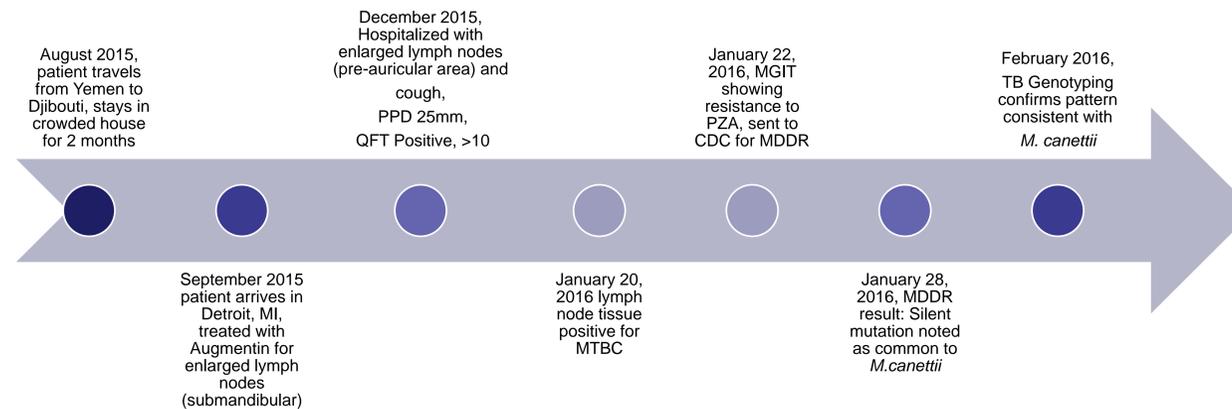


Case Report

A 14 month old male presented to a pediatrician with submandibular swelling. He was treated unsuccessfully with amoxicillin / clavulanate. A new enlarged lymph node appeared in pre-auricular area. He was brought to a large southeastern Michigan hospital with enlarged lymph nodes in the left pre-auricular and submandibular regions. Figure 2 shows an enlarged pre-auricular and submandibular lymph nodes; erythema due to spontaneous drainage. Cough was noted and PPD skin test was positive at 25mm. He was treated with IV Clindamycin. QuantiFERON®-TB Gold Test on day of discharge was positive; TB antigen – nil was >10. After discharge he was referred to the local health department for treatment of latent TB infection. There it was learned he had traveled from Yemen to Djibouti with his mother and 9 year old brother where he stayed in a house in with many women and children. He had received the BCG vaccination at 1 month of age.



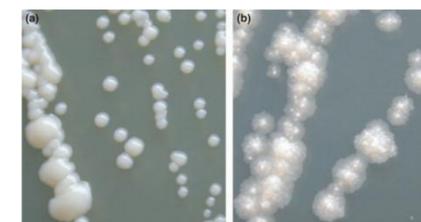
Case Timeline



Lab Results

- **PCR-Positive for MTBC DNA** on lymph node tissue (CT-37.54) and lymph node fluid (CT-35.41) - only verbal report given to physician, test not validated for non-respiratory specimens
- MDDR by CDC on “heat killed” specimen - no amplification for *rpoB* (RRDR) and *inhA* (promotor), no mutation in *katG* (Ser315 codon)
- **HPLC: flow - *M. gastri*, visual - MTBC**
- Genetic Probe: MTBC
- MGIT AST: Susceptible to INH, RIF, Ethambutol, **Resistant to PZA**
- MDDR by CDC on MGIT sediment to confirm PZA:
 - pncA* (promoter, coding region): Silent mutation: GCA>GCG; Ala46Ala**
 - Unable to rule out PZA resistance
 - The Ala46Ala silent mutation is reported in the literature as common to *M. canettii* which is inherently pyrazinamide resistant
- MGIT AST by CDC: **Resistant to PZA**
- **Colony Morphology: cream, smooth** (See Figure 3a.)
- Biochemical testing:
 - Niacin - Negative
 - 68° Catalase - Negative
 - Nitrate - Positive
 - Pyrazinamidase - Positive
 - TCH (Thiophen-2-carboxylic acid hydrazide) - Resistant
- TB Genotyping:
 - Spoligo Type: 000000000000 MIRU: 323212632428 MIRU2: 363ba524421-
 - GENType: G30920 PCRTYPE: PCR22428
 - Genotyping Lineage: *M. canettii***

Figure 3a. *M. canettii* colony morphology
3b. *M. tuberculosis* colony morphology

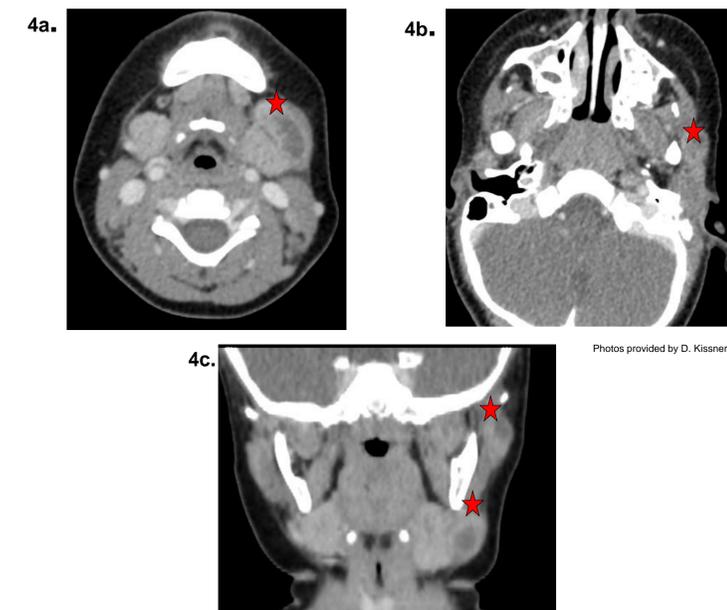


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Clinical Results and Interpretation

- This is not latent TB because of the signs and symptoms of TB
- Identifying the causative agent and testing it for drug resistance is necessary for selecting the best therapy
- Obtaining drug susceptibility should be the main goal of biopsy
 - With small specimens that are expected to be paucibacillary effort should be made to not waste material on unnecessary tests
- As expected, there was a very low volume of AFB in the lymph node tissue. Susceptibility to INH, RIF, and Ethambutol was reported and the possibility of PZA resistance was communicated verbally
 - MGIT broth was sent to CDC for MDDR for PZA
- A silent mutation was identified and reported as common to *M. canettii*
- The patient was treated with INH and Rifampin for 9 months
 - Without PZA, treatment of *M. tuberculosis* for 9 months is necessary to prevent relapse
 - Empiric treatment of this child for TB would have put him at risk for relapse

Figure 4a. and 4b.
Computerized Tomography (CT) with Contrast-Axial view
Figure 4c. CT with Contrast-Coronal view



Red stars: Soft tissue masses inferior to the left mandibular angle and pre-auricular region. There is rim enhancement from the contrast material (white) and central low attenuation (dark gray) with septations. These are typical findings of mycobacterial lymph node infections.

References

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2. Koeck J, Fabre M, Simon F, Daffe M, Garnotel E, Matan A, Gerome P, Bernatas J, Buisson Y, Pourcel C. Clinical characteristics of the smooth tubercle bacilli *Mycobacterium canettii* infection suggest the existence of an environmental reservoir. *Clin Microbiol Infect.* 2011; 17:1013-1019. DOI: (10.1111)1469-0691.2010.03347.x

Acknowledgments

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Final Report: *Mycobacterium tuberculosis* complex
Molecular testing done by CDC indicates a Genotype consistent with *Mycobacterium canettii*