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Case Report of Rare Mycobacterium Isolated from Mediastinal Abscess

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Introduction

Mycobacterium arupense, a member of the *Mycobacterium terrae* complex identified in 2016, rarely causes infections despite isolation from multiple environmental sources, including water, soil and fish tanks.[1] Case reports have described tenosynovitis, osteomyelitis and disseminated infection in an immunocompromised host.[1-3] Here we describe a case of *M. arupense* identified in a polymicrobial mediastinal abscess in a pediatric patient subsequently diagnosed with autosomal dominant hyper-IgE syndrome (AD-HIES).

Case Description

A 4-year-old female with a history of pneumonia, herpetic skin infection, orbital cellulitis, and eczema presented in respiratory distress with concern for pneumonia. Imaging revealed a posterior mediastinal abscess which was drained on Day 3. Blood cultures identified *Streptococcus anginosus*, and the abscess fluid grew *Streptococcus anginosus*, *Streptococcus mitis/oralis* and *Candida albicans*. An esophagram and esophagogastroduodenoscopy revealed an esophageal sinus opening and fistula draining into the mediastinal abscess. After surgical closure, the fistula recurred, and an esophageal wound vacuum assisted closure (VAC) was placed. On Day 25, the initial acid-fast bacillus (AFB) abscess culture became positive, and ethambutol, rifampin, azithromycin and amikacin were started. The AFB was identified as *M. arupense,* and treatment was modified to clarithromycin, rifabutin, and ethambutol. Her course was complicated by drug-induced neutropenia and transaminitis. She received in total 61 days of antifungal, 58 days of antibacterial, and 40 days of *M. arupense* coverage. Due to the atypical infection, immune evaluation was performed and demonstrated low Th17 lymphocytes. Genetic testing detected a heterozygous pathogenic missense variant in *STAT3* (c.2141C>T) consistent with AD-HIES.

Discussion

This is the first case report of *M. arupense* isolated from a mediastinal abscess. Most *M. arupense* infections are secondary to direct inoculation injuries with resulting tenosynovitis and osteomyelitis.[1,3] It is recognized as a possible respiratory tract colonizer, and therefore must meet clinical and microbiological criteria for diagnosis of NTM pulmonary disease.[4,5] Limited susceptibility data has shown 97.5-100% of isolates susceptible to clarithromycin, ethambutol, and rifabutin.[3] Empiric therapy with these three drugs is recommended pending susceptibility data. Treatment duration data is limited but adequate source control is needed as shown here. Evaluation of inborn errors of immunity should be considered in atypical and severe infections, which led to the diagnosis of AD-HIES. AD-HIES due to dominant-negative mutations in *STAT3* is characterized by elevated IgE, eczema, connective tissue and skeletal abnormalities, vascular malformations, and recurrent skin and pulmonary infections.[6,7] Loss of STAT3 activation and Th17 response underlies our subject's susceptibility to mycobacterial disease.[8]

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