Clinical Case Report

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Anti-interferon-γ autoantibody-associated disseminated *Mycobacterium abscessus* infection mimicking parotid cancer with multiple metastases

A case report

Po-Hsiung Chang, MD[a], Yu-Chung Chuang, MD[b,*]

Abstract

Rationale: Among the nontuberculous mycobacteria, *Mycobacterium abscessus* is a common cause of skin, soft tissue, and bone infections. However, disseminated *M. abscessus* infection that mimics cancer metastasis with an underlying relatively immunocompetent condition has rarely been reported.

Patient concerns: A nonsmoking 73-year-old man with an underlying relatively immunocompetent condition reported a 2-month history of a mass in the region of his right parotid gland that had been steadily increasing in size.

Diagnoses: The head and neck computed tomography showed an avidly enhancing tumor with central necrosis in the right parotid region and lymphadenopathy bilaterally at neck levels II–V (<6 cm) with a necrotic core. The radiologist and otolaryngologist both suspected a diagnosis of right parotid gland cancer with metastasis.

Interventions: The necrotic tissue was removed surgically, and *Mycobacterium* culture showed *M. abscessus*. We collected a blood sample and detected anti-interferon-γ autoantibody.

Outcomes: After 6 months of anti-M. *abscessus* treatment, physical examination showed remission of the parotid tumor, and axillary and supraclavicular lymphadenopathy.

Lessons: We report a case of disseminated *M. abscessus* infection, which involved parotid glands with multiple lymphadenopathies in a person with an underlying relatively immunocompetent condition. Possible underlying mechanisms such as anti-interferon-γ autoantibody-associated immunodeficiency should be considered in a patient with disseminated *M. abscessus* infection without a known immunocompromised condition.

Abbreviations: CT = computed tomography, dNTM = disseminated nontuberculous mycobacteria, HIV = human immunodeficiency virus, NTM = Nontuberculous mycobacteria.

Keywords: anti-interferon-γ autoantibody, *Mycobacterium abscessus*, parotid gland cancer

1. Introduction

Nontuberculous mycobacteria (NTM) are common in the environment and are considered less virulent than *Mycobacterium tuberculosis* to humans.[1–3] Among the NTM, *Mycobacterium abscessus* is a common cause of skin, soft tissue, and bone infections.[4] Most clinical NTM infections are localized, but under certain conditions, these infections can be disseminated. A majority of disseminated NTM (dNTM) infections occur in patients with a compromised immune status, often due to a malignancy or infection with human immunodeficiency virus (HIV).[5] However, disseminated *M abscessus* infection that mimics cancer metastasis with an underlying relatively immunocompetent condition has rarely been reported. Here, we report a 73-year-old man with disseminated *M abscessus* infection mimicking parotid cancer with multiple metastases. Considering the underlying immunocompetent status of the patient, we collected a blood sample to detect anti-interferon-γ autoantibody, which is a recently recognized mechanism of dNTM infection.[6]

2. Case presentation

The Research Ethics Committees of the National Taiwan University Hospital approved this study and the informed consent was obtained.

A nonsmoking 73-year-old man reported a 2-month history of a mass in the region of his right parotid gland that had been steadily increasing in size, and left upper limb swelling with an armpit mass was also noted 5 months before admission. His associated symptoms were fevers and fatigue. On physical examination, there was bilateral axillary and supraclavicular

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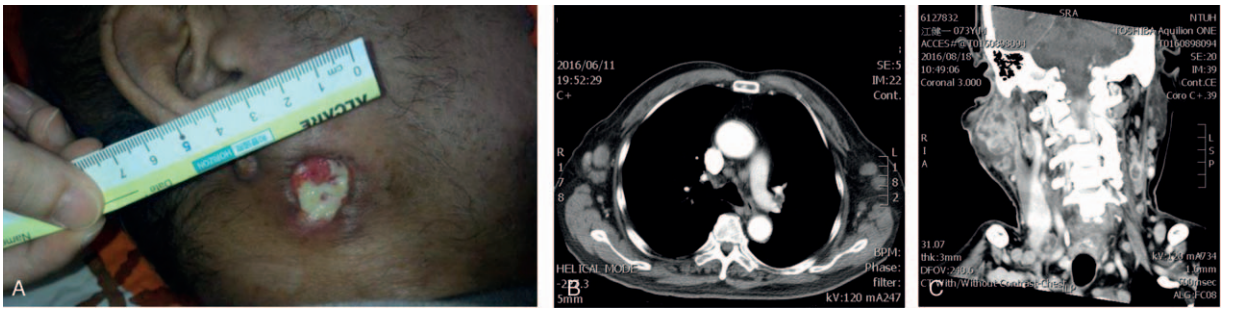

Figure 1. (A) Gross finding with focal tissue necrosis in a 2 × 2 cm defect. (B) Chest CT with contrast; lymphadenopathy bilaterally over the axillary regions, mediastinum, and right hilum. (C) Head and neck CT with contrast; a tumor with central necrosis in the right parotid region, and lymphadenopathy bilaterally at neck levels II-V (<6 cm). CT = computed tomography.

lymphadenopathy. There was also a tender, reddish, and enlarged (5 cm in diameter) right parotid gland with pus and a fibrin coating (Fig. 1A). The chest computed tomography (CT) showed lymphadenopathy bilaterally over the axillary regions, mediastinum, and right hilum (Fig. 1B). CT-guided lymph node biopsy of left axillary lymphadenopathy revealed only necrosis and a tiny noncaseating granuloma. The head and neck CT showed an avidly enhancing tumor with central necrosis in the right parotid region and lymphadenopathy bilaterally at neck levels II-V (<6 cm) with a necrotic core. The radiologist and otolaryngologist both suspected a diagnosis of right parotid gland cancer with metastasis (Fig. 1C). Initially, the patient underwent a core needle biopsy of the right parotid gland. Pathology showed an abscess with focal tissue necrosis. Numerous acid-fast positive bacilli were revealed. Because the head and neck CT was highly suspicious for parotid cancer, incisional drainage and biopsy were performed. The necrotic tissue was removed surgically without complications.

Final pathological findings demonstrated an abscess with focal tissue necrosis. Microscopically, the biopsy showed numerous acid-fast bacilli and necrotic debris (Fig. 2A and B). No pathogen was identified in periodic acid-Schiff staining or Gömöri methenamine stain. The excised necrotic tissue was sent for mycobacterial culture. The specimen was spread onto Lowenstein-Jensen slopes and tested using a fluorometric BACTEC system (BACTEC Mycobacterium Growth Indicator Tube 960 system; Becton, Dickinson and Company). Mycobacteria were identified to the species level using conventional biochemical methods.[7] *Mycobacterium* growth was noted after 6 days of culture in a Mycobacterium Growth Indicator Tube. Species level identification showed *M abscessus*. Considering the underlying immunocompetent status of the patient, we collected a blood sample and detected anti-interferon-γ autoantibody. After 6 months of anti-*M abscessus* treatment, which included 1 month of azithromycin, imipenem, and doxycycline, and 5 months of azithromycin, doxycycline, and levofloxacin, physical examination showed remission of the parotid tumor, and axillary and supraclavicular lymphadenopathy.

3. Discussion

Among the NTM, *M abscessus* is a common cause of skin, soft tissue, and bone infections.[4] dNTM infection can mimic soft tissue malignancy, lymphoma, and cancer metastasis.[8–11] In contrast to NTM infection of the head and neck region in children,[12–16] NTM-caused cervical lymphadenitis is rare in adults.[12] Most of the reported NTM infection with parotitis in adults have underlying immunodeficiency, such as HIV infection or rheumatic disease with steroid use.[17–20] Here, we reported our unusual case of disseminated *M abscessus* infection that involved parotid glands with multiple lymphadenopathies in a person with an underlying relatively immunocompetent condition. Therefore, possible underlying mechanisms such as anti-interferon-γ autoantibody-associated immunodeficiency should be considered in a patient with disseminated *M abscessus* infection without a known immunocompromised condition. Anti-interferon-γ autoantibody-associated immunodeficiency is an emerging medical issue worldwide and plays an important role in mycobacterial infection.[21] However, the underlying mechanism that triggers anti-interferon-γ autoantibody production remains unclear. The clinical impact of anti-interferon-γ autoantibody is being increasingly recognized especially in people from East Asia, and in those of Asian descent.[6]

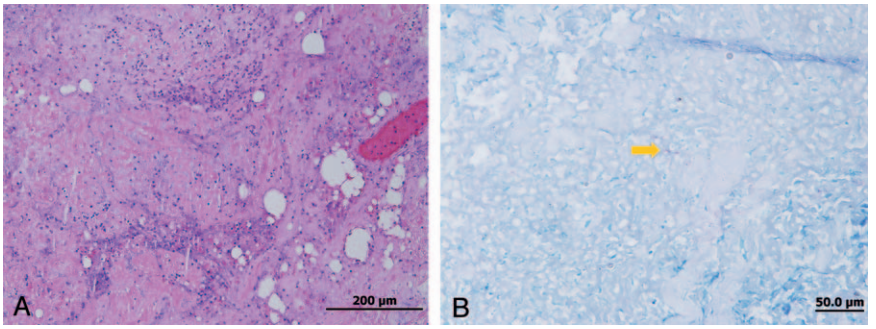

Figure 2. (A) Hematoxylin and eosin staining (H&E) (×20) and (B) acid-fast staining (AFS) (×1000); an abscess with focal tissue necrosis and numerous acid-fast bacilli (arrow).

In Taiwan, anti-interferon-γ autoantibody has been recognized as a mechanism of dNTM infection.[6] In addition, identifying anti-interferon-γ autoantibody-associated immunodeficiency might be important because certain adjunct therapies such a rituximab or epitope-erased variant of interferon-γ might be used in the treatment of anti-interferon-γ autoantibody-associated refractory dNTM infection.[22–24]

The present study has some limitations. First, this is a single case study; not every dNTM infection patient was tested, nor proved to have anti-interferon-γ autoantibody. However, we emphasize that dNTM is a rare presentation of a patient without a known immunocompromised condition, and the underlying covert immunodeficiency warrants further study. Second, the trigger for the production of anti-interferon-γ autoantibody-associated immunodeficiency remains elusive. Some studies describe its pathophysiology with the blocking of production of downstream mediators of interferon-γ activity, including STAT1 phosphorylation, TNFα, and interleukin 12.[5,24] Despite these limitations, our case report offers valuable clinical differential diagnosis of a patient with dNTM infection and anti-interferon-γ autoantibody-associated immunodeficiency to physicians who might come across such cases.

In summary, we report a case of disseminated *M abscessus* infection that involved parotid glands with multiple lymphadenopathies in an elderly person with an underlying relatively immunocompetent condition. This case highlights the need for surgeons to be aware of the potential for clinical features similar to parotid malignancy. We recommend that disseminated *M abscessus* infection should be considered in the differential diagnosis of tumors arising around the parotid gland. These lesions of dNTM infection may be mistaken for lymphoma or metastasis radiologically; in particular, those in the head and neck may have radiological features similar to those of parotid or salivary gland cancers. Possible underlying mechanisms such as anti-interferon-γ autoantibody-associated immunodeficiency should be considered. In addition, further studies with large numbers of cases are needed for a better understanding of the relationship between NTM infections, autoantibodies to anti-interferon-γ, and parotid tumors.

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