Mycobacterium mageritense Parotitis in an Immunocompetent Adult

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Abstract *Mycobacterium mageritense*, a rapidly growing mycobacterium, is a rare clinical pathogen. Furthermore, parotitis due to non-tuberculosis mycobacterium is very rare in adults. Herein, we report the first case of *M. mageritense* parotitis in an immunocompetent adult. A 40-year-old man presented with swelling in a left parotid lesion. He was diagnosed with parotitis. The culture from the parotid abscess grew *M. mageritense*. He was unsuccessfully treated with levofloxacin monotherapy. Trimethoprim–sulfamethoxazole was added, leading to some clinical response; however, the erythema persisted despite 14 months of antibiotic therapy. Subsequently, the skin lesion was surgically removed. The antibiotic treatment was ceased a week after surgery as the postoperative course was uneventful and the lesion had improved. No recurrence was noted at 7 months after surgery. Although extremely rare, *M. mageritense* can cause parotitis in immunocompetent adults, and may not be sufficiently treated with antibiotics alone.

Keywords *Mycobacterium mageritense* · Parotitis · Immunocompetent adults · Non-tuberculosis mycobacterium

Introduction

Mycobacterium mageritense is a rapid growing mycobacterium belonging to the *Mycobacterium fortuitum* group [1]. It is found in environments such as polluted soils and in specimens such as human sputum, even without any signs of infection [2].

Although human infections due to *M. mageritense* are very rare, there are some case reports involving skin and soft tissue infections, pneumonia, and hospital-acquired infections [3–10]. However, parotitis due to this microorganism has not been reported. Herein, we present a case of *M. mageritense* parotitis in a patient who was immunocompetent.

Materials and Methods

Case History

A 40-year-old man presented to our hospital with swelling in the left parotid gland that also showed the presence of a lesion. He had a history of parotitis 4 years previously, with bilateral facial swelling, high-grade fever, and mild testicle pain, which resolved spontaneously within 7 days. Although no serological tests were performed, he had been diagnosed with mumps in accordance with the presence of typical symptoms. There was no history of trauma or insect bites and he was otherwise healthy. He had received a Bacillus Calmette–Guérin vaccine during childhood.

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On admission, the patient was alert and well. His body temperature was 36.5 °C, blood pressure was 103/68 mmHg, heart rate was 105 beats/min, and respiratory rate was 20 breaths/min. His physical examination findings were unremarkable except for erythema with desquamation in a preauricular lesion (Fig. 1). His blood examination results were as follows: white blood cell count, 7900/ μ L; hemoglobin level, 15.1 g/dL; and platelet

Fig. 1 Preauricular lesion findings; pre-treatment. Erythema with desquamation in the preauricular lesion is shown pre-treatment

count, 130,000/ μ L. The levels of electrolytes and transaminases, and renal function were normal. His amylase level was 73 IU/L, glucose level was 97 mg/dL, and C-reactive protein level was 0.09 mg/dL. Chest radiography findings were unremarkable. Gadolinium-enhanced magnetic resonance imaging showed abscess formation in the left parotid gland (Fig. 2). Needle drainage of the abscess was performed, and the culture of the abscess grew a mycobacterium species confirmed to be *M. mageritense* by 16S rRNA sequencing, rpoB gene sequencing, and mass spectrometry. The amylase concentration of the abscess was 300,000 IU/L. Thus, he was diagnosed with *M. mageritense* parotitis. The patient had no evidence of immunodeficiency. Human immunodeficiency virus rapid antigen and antibody test results were negative and he did not report any other history of increase in number of infections before this episode. He received no immunosuppressive agents, and his previous age-appropriate health screenings were normal. Surgical resection of the lesion was not performed because the patient did not provide consent. Thus, antibiotic treatment with 500 mg oral levofloxacin alone was initiated, with an initially favorable response. However, aggravation and disintegration of the skin lesion occurred 3 months after treatment initiation. This resolved spontaneously, but re-emerged 7 months after treatment initiation (Fig. 3a). Therefore, 8 months after treatment initiation, oral trimethoprim-sulfamethoxazole (two single-strength tablets) twice per day was added to the oral levofloxacin.

The subsequent course was favorable, without aggravation or disintegration; however, the erythema remained (Fig. 3b). At 14 months after treatment initiation, the skin lesion was surgically removed. Antibiotic treatment was ceased a week after surgery as the postoperative course was favorable and the lesion had improved. One year after surgery, no relapse or complications have occurred (Fig. 3c).

Results and Discussion

M. mageritense can cause various infections in humans, albeit rarely. For example, skin and soft tissue infections [3, 5], sinusitis [4], pneumonia [10], and hospital-acquired infections, including catheter-related bloodstream infections [4, 6], implantable cardioverter defibrillator-related infections [7], prosthetic valve endocarditis [8], and intrathecal catheter-related meningitis [9] have been reported. Furthermore, parotitis due to non-tuberculosis mycobacterium (NTM) occurs mainly in young children [11]. There is only one previously reported case of a mycobacterium infection in the parotid gland of an adult; however, the specific species could not be identified [12].

Fig. 2 Gadolinium-enhanced magnetic resonance imaging findings. A heterogeneously enhancing mass is revealed in the left parotid gland (white arrows). **a** Horizontal section; **b** longitudinal section

Fig. 3 Preauricular lesion findings; post-treatment. **a** The skin lesion is improved at 7 months of oral levofloxacin; however, the erythema persists; **b** the erythema remains after 6 months of combined oral

trimethoprim-sulfamethoxazole and levofloxacin therapy; **c** surgical wound 1 year after surgery

Table 1 Susceptibility of *M. mageritense* strain isolated from the patient

Antimicrobial agent	MIC (μg/mL)
Imipenem/cilastatin	1
Amikacin	> 64
Ciprofloxacin	0.5
Levofloxacin	0.5
Linezolid	2
Sulfamethoxazole/trimethoprim	2
Kanamycin	> 128
Rifampicin	> 32

Thus, adult cases of parotitis due to NTM are extremely rare, and in particular, *M. mageritense* parotitis has never been reported.

Treatment of a NTM infection usually requires a long duration of antibiotic therapy. In our case, 8 months of oral levofloxacin therapy alone and 6 months of combined oral trimethoprim–sulfamethoxazole and levofloxacin therapy failed to treat the remaining skin lesion, despite good

susceptibility in vitro (Table 1). Six cases out of the 12 currently reported *M. mageritense* infection cases involved skin and soft tissue infections (Table 2). Two of the cases were associated with footbaths at a nail salon; these infections involved only a shallow lesion of the skin, resolving within 2–3 months of antimicrobial treatment alone [3]. Two cases involved surgical site infections; these infections involved deeper lesions of the skin, requiring surgical resection [4]. One case involved an infection following a tsunami-related wound and resolved spontaneously [5]. The present case involved a skin lesion; this infection progressed from a deep parotid gland and appeared to be untreatable without a surgical procedure. The American Thoracic Society and the Infectious Diseases Society of America recommend a minimum of 4 months of therapy against *Mycobacterium fortuitum* skin and soft tissue infections, and surgery is indicated for extensive disease, abscess formation, or when drug therapy is difficult [13]. Excision may lead to an earlier cure, or sometimes may be essential for a cure; however, excision should be done with caution when the lesion is cervicofacial. One systematic review and meta-analysis on NTM

Table 2 Reported cases of *M. mageritense* infections

Age/sex ^a	Underlying condition	Disease	Treatment	Duration	Outcome	Reference
40/M	Prior mumps	Parotitis, skin and soft tissue infection	Levofloxacin, ST, then resection	14 months	Cured	Present case
43/F	Footbath	Furunculosis	ST, levofloxacin	3 months	NA	3
56/F	Footbath	Furunculosis	Gatifloxacin	2 months	NA	3
37/F	Liposuction	Surgical site infection	Doxycycline, ciprofloxacin, then resection	4 months	Cured	4
25/M	Open femur fracture	Surgical site infection	Amikacin, imipenem, then resection	NA	Improved	4
48/M	Injury after tsunami	Skin and soft tissue infection	None	NA	Cured	5
32/F	Immunosuppression	Catheter-related bloodstream infection	Amikacin, linezolid	NA	NA	4
26/F	Pregnancy	Catheter-related bloodstream infection	ST	2 weeks	Cured	6
59/F	Brugada syndrome	Implantable cardioverter defibrillator infection	Levofloxacin, amikacin, rifampicin	12 months	Cured	7
47/F	Rheumatic aortic stenosis	Prosthetic valve endocarditis	Amikacin, moxifloxacin, azithromycin, imipenem, then doxycycline, moxifloxacin, imipenem	NA	NA	8
39/F	Intrathecal catheter	Meningitis	Doxycycline, linezolid, moxifloxacin, then cotrimoxazole, doxycycline, moxifloxacin	12 months	Cured	9
51/F	NA	Sinusitis	Ciprofloxacin, clarithromycin	NA	NA	4
54/F	Systemic lupus erythematosus, rheumatoid arthritis	Pneumonia	Amikacin, imipenem, then ST, linezolid	NA	Cured	10

F female M male, ST trimethoprim–sulfamethoxazole

^a Age given in years

cervicofacial lymphadenitis treatment in children showed a higher cure rate for complete excision (98%, 95% confidence interval [CI] 97.0–99.5%) compared to that for antimycobacterial antibiotics (73.1%, 95% CI 49.6–88.3%); however, 10% of patients who went complete excision complicated with facial nerve palsy [14].

In the present case, 14 months of susceptible antibiotic therapy failed while resection led to a cure. Thus, although data are lacking regarding the treatment of NTM cervicofacial infections in adults, antibiotic treatment alone may not be sufficient when the infected lesion is deep or the inflammatory lesion persists after the initial anti-mycobacterial treatment. However, excision should be performed with caution, and a firm exposition regarding the risk of complications such as facial palsy and infection is necessary.

In conclusion, *M. mageritense* can cause parotitis in immunocompetent adults. Antibiotics alone may not sufficiently treat NTM parotitis. For intractable cases, surgical excision should be combined with antibiotic therapy, under caution of facial palsy.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest.

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