CASE REPORT

Mycobacterium avium Auricular Infection in an Apparent Immunocompetent Patient: A Case Report

Panagiota Vlachogianni¹, Maria Volosyraki¹, Maria Stefanidou², Sabine Krueger-Krasagakis², George Evangelou², Vrettos Haniotis³, Diamantis Kofteridis⁴, Sofia Maraki⁵, Konstantin Krasagakis²

¹ Medical School, University of Crete, Heraklion, Crete, Greece

² Department of Dermatology, University General Hospital of Heraklion, Heraklion, Crete, Greece

³ Department of Pathology, University General Hospital of Heraklion, Heraklion, Crete, Greece

⁴ Department of Internal Medicine, University General Hospital of Heraklion, Heraklion, Crete, Greece

⁵ Department of Clinical Bacteriology, Parasitology, Zoonoses and Geographical Medicine, University General Hospital of Heraklion, Heraklion, Crete, Greece

Correspondence: Konstantin Krasagakis, Department of Dermatology, University General Hospital of Heraklion, Voutes, Heraklion, Crete 71500, Greece
E-mail: krasagak@med.uoc.gr
Tel: +302 810 392 356

Received: 9 Feb 2016

Accepted: 12 May 2016

Published: 30 June 2016

Key words: *mycobacterium avium*, skin and soft tissue, infection, immunocompetent, case report

Citation: Vlachogianni P, Volosyraki M, Stefanidou M, Krueger-Krasagakis S, Evangelou G, Haniotis V, Kofteridis D, Maraki S, Krasagakis K. *Mycobacterium Avium* Auricular Infection in an Apparent Immunocompetent Patient: a Case Report.

Folia Medica 2016;58(2):131-135, doi: 10.1515/folmed-2016-0012

Introduction: Soft tissue infections with *Mycobacterium avium* complex are more likely to appear in immunocompromised patients. However, they may rarely arise in non-immunosuppressed individuals.

Aim: To present the case of an ear infection with *Mycobacterium avium* in the absence of demonstrable immunosuppression.

Case Report: Clinical case description, blood tests, routine histology and tissue cultures.

Discussion: A female, apparent immunocompetent patient presented with a 6-month reddish, oedematous and painless lesion with fine scaling in the right ear. Histology showed numerous granulomas, composed of epithelioid histiocytes without central necrosis. Cultures grew *Mycobacterium avium*. An unusual accidental ear injury was the portal of microbial entry. The patient's lesion fully regressed after a 9-month course of antibiotics.

Conclusion: Although *M. avium* infections are rare in immunocompetent patients, the possibility of such infections should be considered even in these subjects, when relevant clinical features and exposure to risk factors are present.

INTRODUCTION

Mycobacterium avium complex (MAC) is a group of genetically related atypical mycobacteria which includes *Mycobacterium avium* and *Mycobacterium intracellulare*. There are mainly three different forms of disease in humans caused by MAC: pulmonary disease mostly in patients with or without underlying lung disease; disseminated infection in immunocompromised patients, and cervical lymphadenitis.¹⁻³ Skin and soft tissue MAC infection is rare in immunocompetent hosts.³ Regarding cutaneous MAC infection, the most common anatomical location is the upper limb, especially hands and fingers.⁴

We report here a rare case of auricular *M. avium* infection in an apparent immunocompetent patient.

CASE REPORT

A 78-year-old female patient presented with a 6-month reddish, oedematous and painless lesion in the right ear with fine scaling and well defined but irregular borders, involving the lobule, scaphoid fossa and helix (**Fig. 1**). Treatment with local corticosteroids during the last month showed no improvement.

The patient had a history of atrial fibrillation, arterial hypertension and thrombocytosis. Her medi-

Figure 1. The patient's right ear shows an erythematous and edematous lesion, with irregular borders and desquamation.

cation included pantoprazole, simvastatin, acenocoumarol, propafenone, telmisartan, metoprolol, and hydroxyurea. From the clinical examination, the patient's cervical, submandibular and axillary lymph nodes were slightly enlarged (smaller than 1 cm). Our differential diagnosis included lupus vulgaris, Hansen's disease, sarcoidosis, and lupus erythematosus. A chronic auricular perichondritis was not considered, due to absence of tenderness and infiltration of the perichondrium.

Laboratory tests at admission revealed a white blood cell count of 7.9 K/ μ L with neutrophils 4.7 K/ μ L, lymphocytes 1.5 K/ μ L, monocytes 1.6 K/ μ L, macrocytic anaemia (haematocrit 31.6%, haemoglobin 9.9 g/dL, MCV 117.1 fL, MCH 36.6 pg), and thrombocytosis (PLT 1125 K/ μ L). Other abnormal findings included an elevated LDH (364 U/L) and ESR (55 mm/h). Gamma globulin levels (3.4 g/dL) were normal and HIV-antibody test was negative. Mantoux test was also negative and chest x-ray showed no signs of pulmonary infection. Anti-Borrelia antibodies were negative. Histology showed a spongiotic epidermis and a dense chronic lymphocytic infiltration in superficial and

deep dermis associated with numerous granulomas (**Fig. 2**), composed of epithelioid histiocytes without central necrosis (**Fig. 3**). Histopathological stains revealed no microorganisms. However, culture of a tissue specimen grew *Mycobacterium avium*, verified by genotype *Mycobacterium* (Hain Lifescience, Nehren, Germany). At that time, the patient reported that a month before the onset of symptoms she had sustained an ear injury by stumbling and falling on a flower pot. The patient

Figure 2. Histological image (H&E, original magnification $\times 100$). The epidermis is unaffected. There is a dense chronic lymphocytic infiltration in the superficial and deep dermis, associated with numerous granulomas (arrow).

Figure 3. Histological image (H&E, original magnification $\times 200$). Granulomas are composed of epithelioid histiocytes without central necrosis (arrow).

was intolerant to rifampin and since she had skin involvement but no pulmonary or disseminated disease she received clarithromycin (500 mg twice a day) and ethambutol (15 mg/kg/day), according to antibiotic susceptibility testing. At nine months of follow-up the lesion regressed completely with no signs of relapse in more than 2 years off therapy.

DISCUSSION

There have been 30 acid-fast atypical mycobacteria identified in the literature that do not cause tuberculosis or leprosy. Among nontuberculous mycobacteria, *M. avium-intracellulare* is the most common cause of pulmonary disease. These bacteria are practically ubiquitous with the majority found in fresh and salt water, soil, house dust, eggs, milk, vegetables and dried plants.¹ Occupational or home exposure to the above has been linked to infection with atypical mycobacteria. Underlying predisposing conditions to MAC infection are immunosuppression, malignancy, chronic obstructive pulmonary disease, diabetes mellitus and systemic lupus erythematosus.^{2,5-7} MAC is frequently isolated from patients with AIDS since cellular immunity is crucial for host immunity against MAC. In HIV positive patients, failure of macrophage activation to eliminate intracellular *M. avium* complex is caused by deficient cytokine production.² In addition, drug-induced immunosuppression can play a role in the development of MAC infection, especially in elderly people.⁴ However, it can also occur in otherwise healthy people in whom the infection is manifested either by pulmonary or cutaneous forms.³ In the latter, a history of trauma, e.g. surgical incisions, injury in aquatic environments or by fishing equipment precedes the appearance of the lesions.⁸ Apart from traumatic implantation, cutaneous lesions may appear following cervical lymphadenitis or disseminated disease.⁸⁻⁹

M. avium has been frequently recovered from soil taken from potted plants of patients' home in HIV-infected individuals.¹⁰ History of the unusual accidental injury in this patient was helpful in identifying the portal of microbial entry, although many patients do not actually have memory of such incidents. Interestingly, other mycobacteria, such as the leprosy bacillus, has a predilection for cooler skin and mucosal sites, and involvement of the earlobes is often the earliest manifestation. In our case, there was no evidence of immunosuppression, since white blood cells and immunoglobulins were normal with negative HIV test. Her medical

treatment has not been considered as a predisposing factor for her infection. Hydroxyurea has been related to myelosuppression, usually manifested by anemia,¹¹ while there are no reports of any immunosuppressive effects of this drug. However, it cannot be completely excluded that another form of immunosuppression not studied in our patient, such as the presence of neutralizing anti-IFN- γ autoantibodies predisposing to nontuberculous opportunistic infections,¹² may have contributed to the development of disease. Mantoux reaction was negative in the present case, but in non-tuberculous mycobacterial infections the sensitivity of the tuberculin skin test is 60-70%.^{13,14} Cornerstones of MAC treatment are the macrolides, clarithromycin or azithromycin, and the antituberculous drug, ethambutol. In general, a macrolide with a single companion drug, ethambutol is acceptable for some patients (i.e. mild disease).¹⁵

In conclusion, *Mycobacterium avium* infections are rare in immunocompetent patients. However, the possibility of such infections should be considered even in these subjects when relevant clinical features and exposure to risk factors are present, corroborated by appropriate detection methods.

REFERENCES

1. Kasperbauer SH, Daley CL. Diagnosis and treatment of infections due to *Mycobacterium avium* complex. *Semin Respir Crit Care Med* 2008;29:569-76.
2. Horsburgh CR Jr. The pathophysiology of disseminated *Mycobacterium avium* complex disease in AIDS. *J Infect Dis* 1999;179 Suppl 3:S461-5.
3. Epps RE, el-Azhary RA, Hellinger WC, et al. Disseminated cutaneous *Mycobacterium avium-intracellulare* resembling sarcoidosis. *J Am Acad Dermatol* 1995;33:528-31.
4. Ho MH, Ho CK, Chong LY. Atypical mycobacterial cutaneous infections in Hong Kong: 10-year retrospective study. *Hong Kong Med J* 2006;12:21-6.
5. Rosenzweig DY. Pulmonary mycobacterial infections due to *Mycobacterium intracellulare-avium* complex. Clinical features and course in 100 consecutive cases. *Chest* 1979;75:115-9.
6. Ito Y, Hirai T, Fujita K, et al. Increasing patients with pulmonary *Mycobacterium avium* complex disease and associated underlying diseases in Japan. *J Infect Chemother* 2015;21:352-6.
7. Yazisiz V, Erbasan F, Inan D, et al. Bone marrow infection caused by *Mycobacterium avium* complex in a patient with systemic lupus erythematosus. *Lupus* 2010;19:323-6.
8. Hsiao CH, Tsai TF, Hsueh PR. Characteristics of skin

- and soft tissue infection caused by non-tuberculous mycobacteria in Taiwan. *Int J Tuberc Lung Dis* 2011;15:811-7.
9. Nassar D, Ortonne N, Grégoire-Krikorian B, et al. Chronic granulomatous *Mycobacterium avium* skin pseudotumour. *Lancet Infect Dis* 2009;9:136.
 10. Yajko DM, Chin DP, Gonzalez PC, et al. *Mycobacterium avium* complex in water, food, and soil samples collected from the environment of HIV-infected individuals. *J AIDS Hum Retrovirol* 1995;9:176-82.
 11. Spivak JL, Hasselbalch H. Hydroxycarbamide: a user's guide for chronic myeloproliferative disorders. *Expert Rev Anticancer Ther* 2011;11:403-14.
 12. Browne SK, Burbelo PD, Chetchotisakd P, et al. Adult-onset immunodeficiency in Thailand and Taiwan. *N Engl J Med* 2012;367:725-34.
 13. Kobashi Y, Obase Y, Fukuda M, et al. Clinical reevaluation of the QuantiFERON TB-2G test as a diagnostic method for differentiating active tuberculosis from nontuberculous mycobacteriosis. *Clin Infect Dis* 2006;43:1540-6.
 14. Lindeboom JA, Kuijper EJ, Prins JM, et al. Tuberculin skin testing is useful in the screening for nontuberculous mycobacterial cervicofacial lymphadenitis in children. *Clin Infect Dis* 2006;43:1547-51.
 15. Griffith DE, Aksamit T, Brown-Elliott BA, et al. An official ATS/IDSA statement: diagnosis, treatment, and prevention of nontuberculous mycobacterial diseases. *Am J Respir Crit Care Med* 2007;175:367-416.

Аурикулярная инфекция с *Микобактериум авиум* (*Mycobacterium avium*) у пациента с очевидно здоровой иммунной системой: доклад о клиническом случае

Панайота Влахогиани¹, Мария Волосираки¹, Мария Стефаниду², Сабине Крюгер-Красагакис², Георге Евангелу², Вретос Ханиотис³, Дамантис Кофтеридис⁴, София Мараки⁵, Константин Красагакис²

¹Медицинское училище, Университет Крита, Гераклион, Крит, Греция

²Кафедра дерматологии, Университетская больница в Гераклионе, Гераклион, Крит, Греция

³Кафедра патологии, Университетская больница в Гераклионе, Гераклион, Крит, Греция

⁴Кафедра внутренней медицины, Университетская больница в Гераклионе, Гераклион, Крит, Греция

⁵Кафедра клинической бактериологии, паразитологии, зоонозных инфекций и географической медицины, Университетская больница в Гераклионе, Гераклион, Крит, Греция

Для корреспонденции:

Константин Красагакис, Кафедра дерматологии, Университетская больница в Гераклионе, Волутес, Гераклион, Крит 71500, Греция
E-mail: krasagak@med.uoc.gr
Тел.: +302 810 392 356

Дата получения: 09 февраля 2016 г.

Дата приемки: 12 мая 2016 г.

Дата публикации: 30 июня 2016 г.

Ключевые слова:

Микобактериум авиум, кожа и мягкие ткани, инфекция, здоровая иммунная система, доклад о клиническом случае

Цитаты: Влахогиани П, Волосираки М, Стефаниду М, Крюгер-Красагакис СК, Евангелу Г, Ханиотис В, Кофтеридис Д, Мараки С, Красагакис К. Аурикулярная инфекция с *Микобактериум авиум* у пациента с очевидно здоровой

Введение: Вероятность появления инфекции мягких тканей, возбудителем которой является Микобактериум авиум комплекс, увеличена у пациентов с ослабленной иммунной системой. Несмотря на это, хотя и в редких случаях, такая инфекция может возникнуть и у людей со здоровой иммунной системой.

Цель: Представление случая со случайной ушной инфекцией, вызванной Микобактериум авиум комплексом, при отсутствии выраженной иммуносупрессии.

Доклад о клиническом случае: Описание клинического случая, анализ крови, рутинной гистологии и посева тканей.

Дискуссия: Пациентом является женщина с очевидно здоровой иммунной системой, с красноватым, не вызывающим боль поражением в виде отека, появившимся 6 месяцев назад, с тонким отшелушиванием в области правого уха. При гистологическом исследовании было выявлено множество гранул, состоящих из эпителиальных гистиоцитов без центрального некроза. В посеве было осуществлено культивирование Микобактериум авиум. В качестве портала для вторжения микробов послужило необычно случайное повреждение уха. Имеющееся у пациента повреждение полностью регрессировало после девятимесячного курса лечения антибиотиками.

иммунной системой: доклад о клиническом случае.

Folia Medica 2016;58(2);131-135,
doi: 10.1515/folmed-2016-0012

Заключение: Несмотря на то, что инфекции, причиненные *M. aviium*, встречаются редко у пациентов со здоровой иммунной системой, возможность такой инфекции следует допускать даже и у них, когда наблюдаются соответствующие клинические особенности и воздействие факторов риска.