



## Spontaneous Unilateral Breast Abscess Caused by *Mycobacterium abscessus*: A Case Report

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### Authors' contributions

This work was carried out in collaboration between all authors. Authors PM, JJP and MC participated in the planning of the study, analysis and interpretation of the data, laboratory studies and wrote the first draft of the case report revised it critically and approved the final version. Author BA collected data and contributed to the acquisition of clinical information. Author SM collaborated in the laboratory studies. All authors read and approved the final manuscript.

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Case Report

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### ABSTRACT

*Mycobacterium abscessus* complex is a rapidly growing group of nontuberculous mycobacteria (NTM). Rarely, this organism causes breast infections. The majority of published studies reported an association between onset of infection and breast implants or post-traumatic injuries. We report a spontaneous case of breast abscess caused by *M. abscessus* that it was initially presumed as bacterial abscess. NTM should be considered in diagnosis of mastitis when standard bacterial culture results are negative or when it recurs despite standard antibiotic therapy. We believe this is the first report of spontaneous community acquired mastitis due to *M. abscessus*, in Spain.

**Keywords:** *Mycobacterium abscessus*; mastitis; breast abscess; nontuberculous mycobacteria.

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## 1. INTRODUCTION

Infections due to NTM (nontuberculous mycobacteria) are being identified with increasing frequency [1]. Especially rapidly growing mycobacteria (RGM) are considered to be emerging pathogens, that show growth within seven days. The three most commonly encountered RGM are *M. abscessus*, *M. chelonae* and *M. fortuitum* [2,3]. *M. abscessus* is ubiquitous in soil and aqueous environments and it is usually associated to localize infectious of surgical wounds, pulmonary infections, post-traumatic injuries and disseminated cutaneous infections [4-6]. This organism is the most virulent and chemotherapy-resistant member of the RGM group [7]. Its isolates have been determined to be uniformly resistant to all antituberculosis drugs. Thus, routine treatment with these antituberculosis drugs is not recommended for these organisms [8]. Spontaneous breast abscess due to *M. abscessus* have been rarely described. Several outbreaks involving *M. abscessus* associated with skin and soft tissue infections have also recently been reported demonstrating its importance in healthcare-associated infections, including surgical tourism [9,10]. We reported the case of a woman with spontaneous breast abscess caused by this mycobacterium, who had not suffered local trauma nor undergone surgery.

## 2. PRESENTATION OF CASE REPORT

A 36-years-old Spaniard woman was admitted to Gynecology service in our hospital. Prior to admission, the patient was examined in the

Emergency Room suffering from a week-long acute mastitis which was diagnosed and treated for ten days with cloxacilin (500 mg/day) and ibuprofen (800 mg/day) without clinical response. Preceding presentation, there was no history of foreign travel, respiratory symptoms, previous lactation, trauma or any operations to the breast; furthermore she was not taking any medication, and she was not immunocompromised.

On physical examination, she reported fever that began several days before. The local examination revealed redness, induration and swelling in the upper half of the right breast, extending to the right lower quadrant with not tender fluctuant subareolar mass. Her left breast was normal and no palpable lymph nodes were revealed. A clinical impression of non-specific mastitis was made. Based on the clinical course of infection, the patient was started on amoxicillin/clavulanic acid (875 mg/125 mg) for 15 days.

A week later, and due to persistence of symptoms, various diagnostic studies were made. First, a breast ultrasound was performed and in the examination, large collections of heterogeneous hypoechoic structure with a 58x16 mm diameter, compatible with abscesses, were detected (Fig. 1). The images showed extension to peri-areolar subcutaneous region. Then, drainage of purulent material and fine-needle aspiration (Fig. 2) was performed, and the total amount of extraction, 40 milliliters of purulent exudate, was send to the laboratory for cytological and bacteriological study.

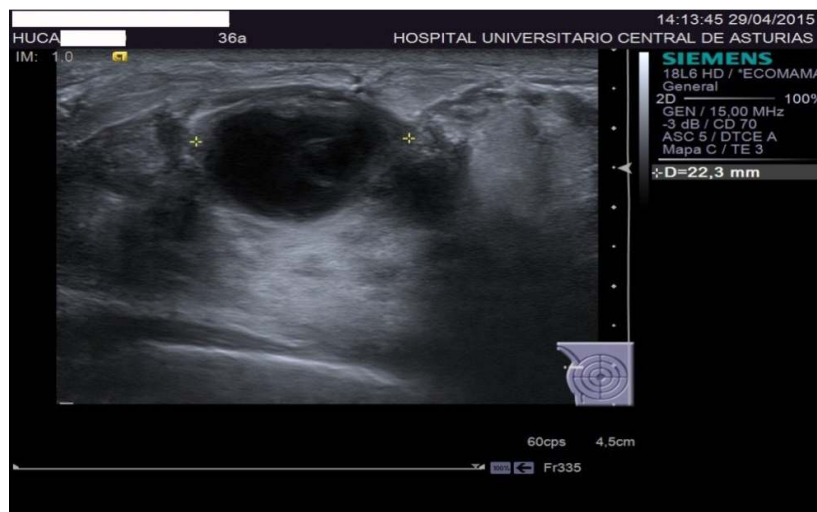
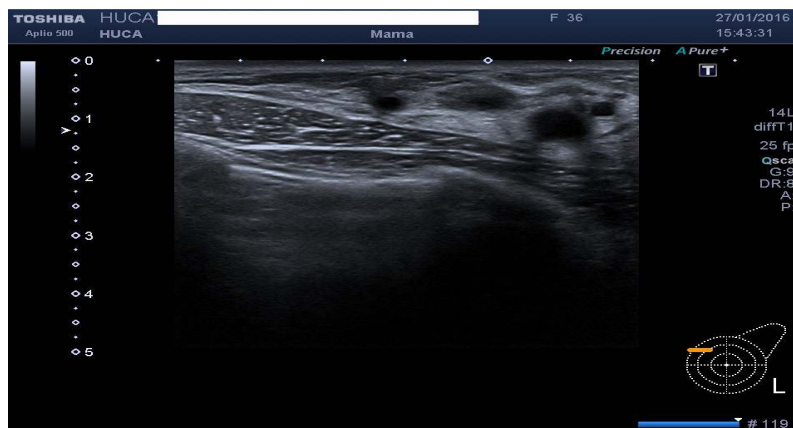


Fig. 1. First breast ultrasound showed the presence of heterogeneous hypoechoic structures compatible with abscesses



**Fig. 2. Fine needle aspiration was performed to evacuate the total amount of 40 ml of purulent material**



**Fig. 3. Follow-up right breast ultrasound, 9 months after diagnosis. In the upper external quadrants was observed persistence of a non-cystic hypoechoic area compatible with post-inflammatory changes**

The pathological examination of the aspiration sample, was consistent with suppurative inflammation. Pus culture, revealed *Mycobacterium abscessus* and the patient was starting on combined antibiotic therapy with clarithromycin (1 g/daily) and ciprofloxacin (1 g/daily) for 40 days.

The treatment was well tolerated and she had undergone control breast mammography and ultrasound (Fig. 3) four times during six months. No clinical or radiological evidence of recurrence was observed within this period.

### 3. MICROBIOLOGY

An aspiration sample culture was directly inoculated into solid and liquid culture media,

Lowestein-Jensen medium and Bactec MGIT960, respectively. PCR for *Mycobacterium tuberculosis complex* (XPERT MTB/RIF) was negative, but 1-9 acid-fast bacilli were seen in the pus after Ziehl-Neelsen staining and a smooth, moist and non-pigmented colonies from Löwestein-Jensen (LJ) slant, within seven days from inoculation, were isolated. The isolate was confirmed to be *M. abscessus sub sp. abscessus* with the Genotype Mycobacterium CM (Hain) and Genotype NTM-DR (Hain) assays. Breakpoint susceptibility testing was performed using the cation-adjusted Mueller-Hinton (CAMH) broth microdilution method [11].

The microorganism was resistant to clarithromycin, doxycycline, moxifloxacin,

streptomycin, ethambutol, ethionamide, isoniazid, pyrazinamide, amoxicillin/ clavulanic acid, imipenem, ciprofloxacin, levofloxacin, trimethoprim/ sulfamethoxazole, rifampicin, linezolid, and amikacin. On the other hand, the strain demonstrated susceptibility to tygecycline.

#### 4. DISCUSSION

The identification of NTM infections is increasing in several countries [1]. In Asturias, infectious caused by NTM have been gradually rising since 2005. According to the Reference Unit for Mycobacteria of Asturias, NTM are isolated in about 150-200 patients/each year (17,1% of them with mycobacteriosis). This group of mycobacteria is incredibly resistant; able to grow in tap water and distilled water, thrive at temperatures of 45°C and resist the activity of organomercurials, chlorine, 2% concentrations of formaldehyde and alkaline glutaraldehyde, and other commonly used disinfectants [12]. *M. abscessus* is a rapidly growing mycobacteria (RGM) which has been implicated as a cause of pulmonary, skin and soft tissue infections that have involved both immunosuppressed and immunocompetent host. Infections usually have an antecedent history of presence in a foreign body, surgery or penetrating trauma, but spontaneous breast abscess has been rarely described. Our patient did not report any exposures predisposing to *M. abscessus* infection. Moreover, it is mostly like that the infection was community-acquired. To our knowledge there has been only one published report of spontaneous breast abscess due to *M. abscessus* [13]; other reports described infection following nipple piercing [14], breast implants [15], mesotherapy [16], or acupuncture [17]. *M. abscessus* is one of the most resistant RGM to chemotherapeutic agents, produces enzymes that potentially degrade or modify antibiotics, which can result in their inactivation. On the other hand, there is an important association between biofilms and mycobacteria persistence and dissemination [18]. During biofilm assembly proceeds, bacteria develop a matrix containing extracellular polymeric substances to form a complex three-dimensional structure. This ability, enhancing their resistance to antimicrobial agents, disinfectants and persistence within health care units since biofilm provide protection against environmental stressors [18,19]. For this reason, infectious caused by these organisms are difficult to treat because their resistance to not only the classical anti-tuberculous drugs, but also to most of the

antibiotics that are currently available [20]. Current recommendations, for *M. abscessus*, are to combine clarithromycin with another drug. Clinical efficacy of this therapy is still controversial, with success for some patients and failure for others [21].

The isolation of the responsible agent in the LJ medium within shorter time was a suspect sign for atypical mycobacteria in our patient. Thus, a molecular and rapid method for identify NTM was performed.

#### 5. CONCLUSIONS

A large number of potentially pathogenic NTM encountered in the clinical laboratory, resistant to the routinely tested antibiotic, requires the need to identify their species to ensure appropriate treatment. Therefore, drug susceptibility test are important for appropriate patient management. *M. abscessus* should be considered in the differential diagnoses of skin and soft tissue infections, especially if there is no improvement of breast infections despite standard antibiotic therapy.

#### ETHICAL APPROVAL

Ethical approval for the study, has been granted by the Ethical Regional Committee of Clinical Investigation of the Principality of Asturias (n 146/16).

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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