

CASE REPORT

A breast abscess caused by *Actinomyces radingae*

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ABSTRACT

Actinomyces radingae is a rare isolate in clinical specimens. We describe a case of a postmenopausal woman presenting with a breast abscess caused by *A. radingae*. To our knowledge, this is the second description of a case of a breast infection due to this pathogen. *J Microbiol Infect Dis* 2016;6(2): 84-86

Key words: *Actinomyces radingae*, breast abscess, actinomycosis

***Actinomyces radingae*'nin neden olduğu bir meme absesi**

ÖZET

Actinomyces radingae, klinik örneklerden nadir izole edilen bir etkenidir. Biz postmenopozal bir kadında *A. radingae*'nin neden olduğu bir meme absesi olgusu sunduk. Bildiğimiz kadarıyla, bu patojene bağlı ikinci meme enfeksiyonu olgusudur.

Anahtar kelimeler: *Actinomyces radingae*, meme absesi, actinomycosis

INTRODUCTION

Actinomycosis is a relatively rare granulomatous suppurative bacterial infection characterized by a chronic course, abscess formation, tissue fibrosis, and draining sinuses. Most commonly involved regions in actinomycosis are the cervicofacial, thoracic, and abdominopelvic regions. In this report, we describe a postmenopausal woman presenting with a breast abscess caused by *Actinomyces radingae*. Breast actinomycosis is rare, especially in postmenopausal women.

CASE

A 60-year old female of Moroccan origin was referred to the surgical outpatient clinic of our hospital because of suspicion of a tumor in her right breast. A wound had appeared on her right breast after she had removed a small skin flake two weeks earlier. Subsequently, she felt a painful mass in her right breast. She had not measured a fever previously to her presentation. She did not have dental or pulmonary problems.

The patient had a history of type 2 diabetes mellitus with nephropathy and polyneuropathy, hypertension and two myocardial infarctions. She used insulin, metoprolol succinate, spironolactone, lisinopril, carbasalate calcium and atorvastatin. She had frequently avoided medical care in the past.

Physical examination revealed an abscess in her right breast with a limited amount of pus. There were no fistulae present, there was no nipple discharge. The abscess was incised and drained. Blood tests were not performed. A swab with the drained fluid was sent to our laboratory for culture and was incubated aerobically and anaerobically at 37 °C. A Gram stain of the specimen was not performed. After 2 days of incubation, some small colonies were visible on the aerobically incubated sheep blood agar (Biomérieux, Marcy l'Etoile, France Fig. 1), on the CAP agar (Columbia CAP Selective Agar with sheep blood, Oxoid), and on the chocolate agar (Biomérieux, Marcy l'Etoile, France) that had been incubated at 37 °C with CO₂ enriched air. A Gram stain showed branched gram-positive rods (Fig. 2). After 3 days of incubation, colonies were

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visible on the anaerobically incubated agars as well. Determination by the Vitek MS (Biomérieux, Marcy l'Etoile, France) revealed an *Actinomyces radingae* (ID confidence 99%). This result was confirmed by 16S rDNA sequencing. The sequences were compared to the NCBI and to the RipSeq databases (Pathogenomix, Santa Cruz, USA). The isolate was tested for antimicrobial susceptibility using Etests (Biomérieux, Marcy l'Etoile, France). Minimum inhibitory concentration (MIC) was 0.047 µg/mL for penicillin G, 0.032 µg/mL for amoxicillin, 0.047 µg/mL for clindamycin, and 8 µg/mL for tetracycline. The isolate was susceptible to penicillin G, amoxicillin and clindamycin, and intermediately susceptible to tetracycline according to the EUCAST criteria [1].

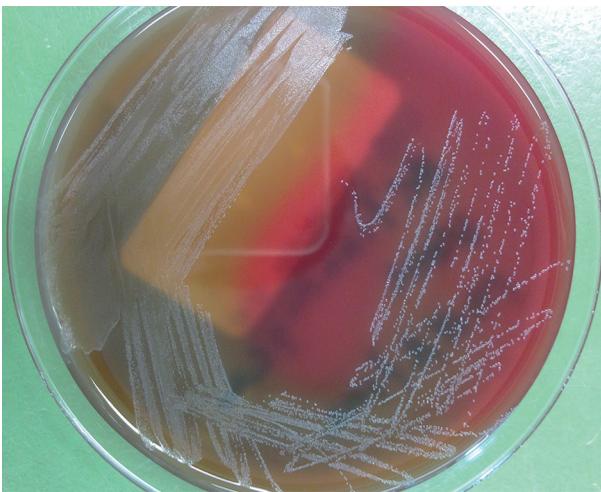


Figure 1. Growth of *Actinomyces radingae* colonies on the aerobically incubated sheep blood agar

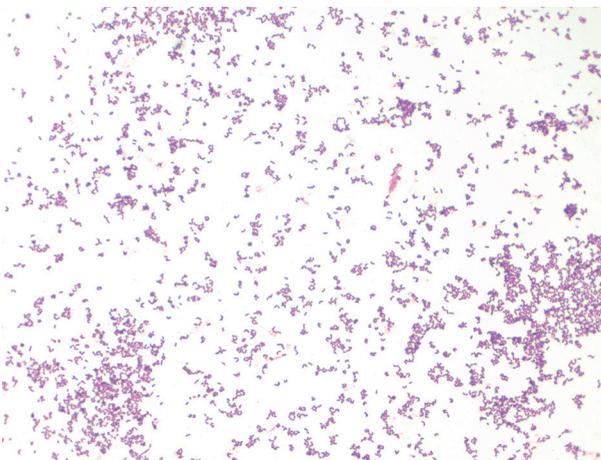


Figure 2. Gram positive rods in the gram stain, (X1000)

Because of her good clinical condition, the patient was treated on an outpatient basis with oral clindamycin 600 mg tid.

Two weeks after incision and drainage of the abscess, the patient returned for clinical evaluation. The pain had decreased, but she had some white/yellowish nipple discharge. Mild redness and tenderness were noted at the location of the earlier abscess. An ultrasound was performed, which showed a small infiltrate, without abscess formation or other focal lesions.

After 3 months of treatment, no residual signs of inflammation were observed and the clindamycin was stopped. After half a year of follow up, the patient had no signs of inflammation. An MRI did not reveal signs of an active abscess or inflammation.

DISCUSSION

To our knowledge, this is the second case description of a breast infection caused by *A. radingae*. The first case report of an *A. radingae* breast infection (in a male patient that also lived in The Netherlands) was described by Attar et al. in 2007 [2].

The genus *Actinomyces* consists of gram-positive rod-shaped anaerobic or aerotolerant bacteria that are non-spore-forming, non-motile and non-acid-fast. In Gram stain, the appearance of the rods is usually branching, except for *A. meyeri*. *Actinomyces* species normally colonize the oral cavity, the gastrointestinal tract and female genital tract. Disruption of the mucosa may lead to infection of virtually any site. Actinomycosis is a relatively rare granulomatous suppurative indolent infection characterized by a chronic course, penetration of tissue boundaries, multiple abscesses and formation of sinus tracts [3]. Actinomycosis is most commonly caused by *A. israelii*, which causes subacute to chronic infections of cervicofacial, thoracic, abdominal, and pelvic areas. Actinomycosis has been called “the most misdiagnosed disease”, because in this antibiotic era the incidence is diminished and, as a consequence, its recognition is often delayed [4]. The disease can mimic malignancy and microbiological cultures may remain negative. Histology might show the pathognomonic ‘sulphur granules’ composed of basophilic structures with elongated eosinophilic clubs radiating from the periphery. The granules contain gram-positive, non-acid-fast bacteria that typically form branching filaments of < 1 µm in diameter [5].

A. radingae was first described in 1995 by Wüst et al., based on 16S rRNA gene sequencing [6]. Whereas *A. israelii* requires anaerobic atmosphere for optimal growth, *A. radingae* can grow under aerobic conditions, in 5% CO₂, and anaerobically. The colonies of *A. radingae* have a different appearance on routine laboratory blood agar than the classic *A. israelii*. Whereas the latter forms typical craters, ragged, pyramidal-like, opaque colonies after 2–3 days incubation (“molar tooth” colonies), *A. radingae* produces round, flat, entire-edged, glistening, whitish colonies on blood agar (Fig. 1) [2].

In several studies, *A. radingae* has been linked with skin related infections and abscess formation. It has been particularly associated with upper-body skin areas [7,8]. In cases where *A. radingae* was isolated, it was cultured in large numbers and it was usually associated with the presence of polymorphonuclear leukocytes.

Breast actinomycosis is rare and has mainly been described in premenopausal women. The disease is classified as primary or secondary, depending on how the microorganisms reach the site of infection. Primary breast actinomycosis occurs when skin flora reaches mammary tissue directly, possibly through cracks in the skin on or around the nipple. Risk factors for development of primary breast actinomycosis include smoking, diabetes, obesity, trauma or lactation. Secondary breast actinomycosis can occur as a result of a pulmonary infection penetrating the thoracic wall. The most common isolated pathogen in breast actinomycosis is *A. israelii*. More recently, breast infections due to *A. viscosus*, *A. turicensis*, *A. europaeus*, *A. odontolyticus*, *A. neuii* and *A. radingae* have been described [2,3,9,10]. Breast actinomycosis may either present as a sinus tract, or with mass-like features mimicking malignancy, or may mimic mastitis. An infection of a mammary prosthesis by *Actinomyces* has been described by Brunner et al. [11].

Actinomycosis has to be treated with antibiotics for a prolonged period of time. Common treatment regimens consist of high-dose penicillin intravenously for 2 to 6 weeks, followed by oral therapy with penicillin or amoxicillin for 6 to 12 months. Milder cases may require a shorter duration of therapy. Alternatives for penicillin are erythromycin, doxycycline, and clindamycin. Especially in cases with abscess formation, infections with *A. radingae* may occur as mixed infections with anaerobic bacteria. In these cases, amoxicillin/clavulanic acid is preferred because of the β -lactamase activity of certain

anaerobes. Well-defined breast abscesses require both antibiotic therapy and percutaneous drainage.

Treatment duration should be individualized. Response to therapy can be monitored by CT scan or MRI. The prognosis of primary breast actinomycosis is good; all reported cases of *Actinomyces* spp. have been successfully treated with a combination of surgical drainage and antibiotic therapy [3].

We described a postmenopausal woman with diabetes mellitus as a risk factor. She developed primary breast actinomycosis by *A. radingae* after she removed a skin flake. She was treated with clindamycin for 3 months after surgical incision and drainage of the abscess.

Declaration of Conflicting Interests: The authors declare that they have no conflict of interest.

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