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CASE FOR DIAGNOSIS

A painful and swollen right breast in a young male

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Case history

A 33-yr-old, Caucasian male, smoker (40 pack-yr) presented to the current authors' hospital complaining of a painful and swollen right breast, which had already lasted a few weeks. He had poor oral hygiene, had been subject to several teeth extractions over the previous 2 yrs and had sporadically used oral antibiotics. He denied fever, cough and shortness of breath or weight loss. The chest physical examination disclosed a painful large soft tissue mass (10×8 cm) on the anterior right side of the chest wall, right in the upper part of the breast.

Vital signs were normal, as were the results of the routine laboratory tests, with the exception of the erythrocyte sedimentation rate and the C-reactive protein, which were both elevated. The arterial blood gas analysis was within the normal range. The tuberculosis skin test was negative. The patient's chest radiograph and the computed tomography (CT) scan are shown in figures 1 and 2, respectively. A surgical biopsy was performed under local anesthesia and the tissue histology is also shown in figure 3.

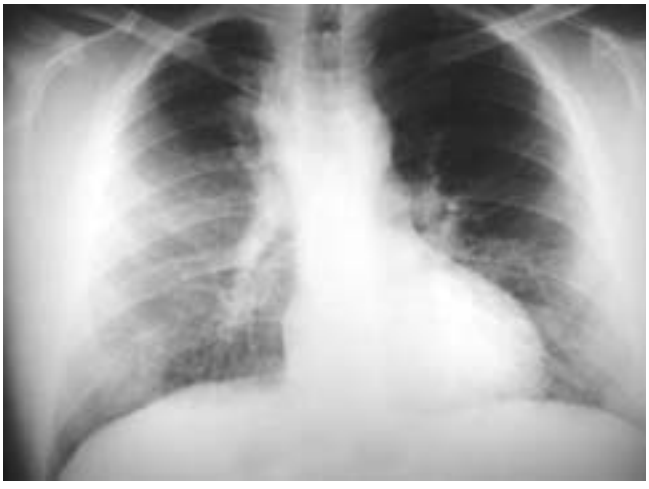

Fig. 1. – Posteroanterior radiograph of the chest on admission.

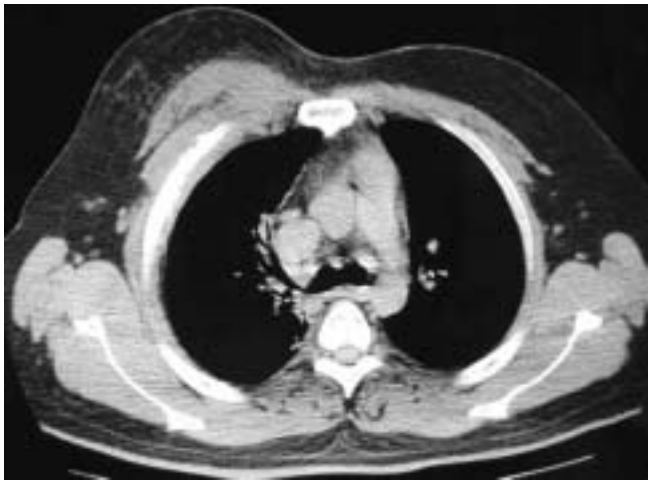

Fig. 2. – Chest computed tomography scan at the level of the upper lobes.

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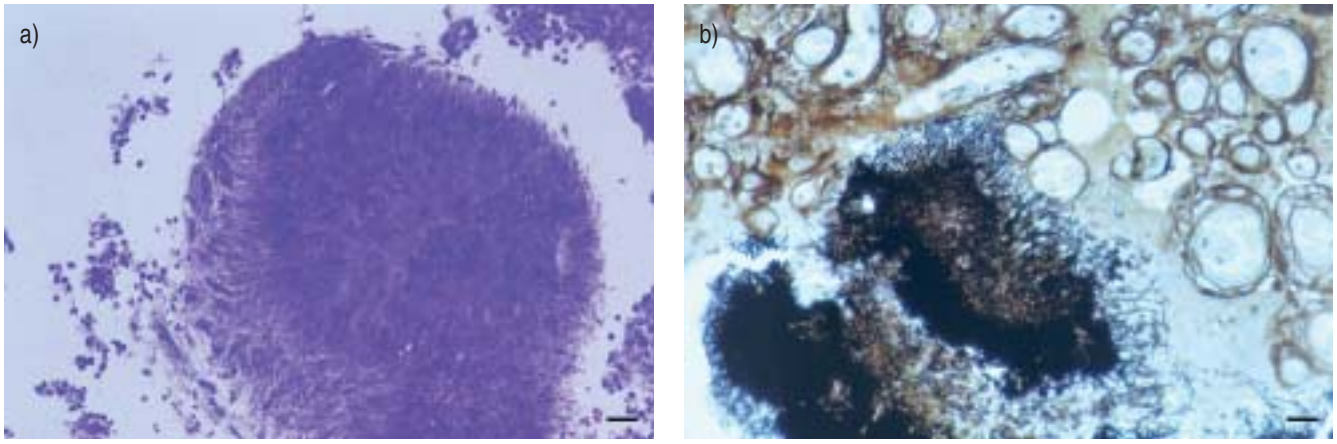

Fig. 3. – a) Haematoxylin and eosin stain of the chest wall soft tissue surgical biopsy; internal scale bar=5 μm. b) Grocott′s methenamine silver stain of the same surgical specimen; internal scale bar=5 μm.

BEFORE TURNING THE PAGE, INTERPRET THE PATIENT HISTORY, CHEST RADIOGRAPH, CT SCAN AND HISTOLOGY, AND SUGGEST A DIAGNOSIS.

Interpretation

Chest radiograph and CT scan

The posteroanterior view of the patient′s chest radiograph (fig. 1) showed a small increase in the dimensions of the right superior mediastinum, plus a poorly defined shadow in the adjacent paramediastinal lung.

The chest CT at the level of the upper lobes (fig. 2) demonstrated a solid soft tissue mass in the right anterior chest wall, which had invaded the major and minor pectoralis and intercostal muscles, osteolisis of the anterior border of the costal rib plus multiple small bilateral axillary lymphonodes.

Pathology

The histopathology of the surgical biopsy, stained with haematoxylin and eosin, revealed multiple colonies of *Actinomyces Israelii*, with the characteristic branching filaments in their periphery, surrounded by few inflammatory cells and immersed into a purulent cavity (fig. 3a). The Grocott′s methenamine silver stain better evidenced the typical peripheral filaments of the *A. Israeli* colonies (fig. 3b).

Diagnosis: "Thoracic actinomycosis".

Treatment and clinical course

The initial differential diagnosis included malignancy (breast carcinoma, rabdomiosarcoma or other) or an inflammatory process, probably a subcutaneous abscess. The surgical biopsy proved *A. Israeli* soft tissue infection. Immediately after the histological confirmation, the patient was treated with penicillin G (24 million U, *i.v.*, daily), which was discontinued 3 weeks later because leukopenia developed. Subsequently, penicillin G was replaced by doxycycline (100 mg twice daily) for a duration of 6 months. In addition, the patient was submitted to an intense programme of restorative dentistry immediately after his discharge from the hospital. A new CT scan obtained 1 month later showed a remarkable reduction in the mass dimensions and the CT scan at 6 months showed the complete resolution of the inflammatory process.

Discussion

Actinomycosis is a subacute or chronic disease caused by anaerobic or microaerophilic bacterial species of the genus Actinomyces. These causative agents are Gram-positive, pleomorphic and filamentous organisms, found in the normal flora of the oral cavity, gastrointestinal tract and bronchial secretions. It classically involves cervicofacial, abdominopelvic, thoracic and mixed organs, including skin, pericardium, brain and limbs [1, 2]. Thoracic actinomycosis (15–20% of all cases) usually involves the lungs, pleura, mediastinum and the chest wall, and is considered a rare infection, particularly in the developed world. MABESA and MACFARLANE [3] reported that, in a teaching hospital in the UK (1,100 beds), serving a large metropolitan area and acting as a regional centre for thoracic surgery, pulmonary actinomycosis was diagnosed histologically in only four cases over a 15-yr period. Predisposing factors are poor oral hygiene, alcoholism and epilepsy, which predispose to colonisation and subsequent aspiration of contaminated oropharyngeal secretions. Other routes of infection include direct extension from cervicofacial infection through the mediastinum to the pleura and the lungs, transdiaphragmatic spread from abdominal infection, and, rarely, haematogenous dissemination [4].

The present patient presented poor oral hygiene, had undergone several teeth extractions and had sporadically and for short periods used oral antibiotics over the previous 2 yrs. The anterior chest wall mass was the presenting manifestation of his disease and this suggests that the infecting organism entered the lung *via* the bronchial tree, by microaspirations of contaminated matter of the oral cavity. In this patient, in can also be assumed that the fact that he didn′t present an extensive and destructive lung involvement might be related to the sporadic use of antibiotics for his dental problems. Indeed, actinomycosis may spread from an early pneumonic focus to the pleura, without necessarily causing grossly evident pleural infection, and then extend to the chest wall, ignoring anatomical barriers, and leading to bony destruction [5, 6]. No cutaneous draining sinus was evident at admission in the patient.

Pulmonary actinomycotic infection may affect immunocompetent hosts, as in this case. Complications of the disease are related to its ability to invade across anatomical barriers, such as interlobar fissures, pleura, mediastinum, pericardium, diaphragm, chest wall, adjacent bones and soft tissue [7].

Actinomycosis, when promptly diagnosed and adequately treated, is a rare disease with a very low mortality rate; however, it can otherwise present considerable morbidity and mortality. The best means of establishing the diagnosis of actinomycosis is by demonstrating the presence of Actinomyces species in cultures of clinical specimens and, most accurately, by the demonstration of sulphur granules containing filamentous organisms in histological examination [4]. Moreover, a histological specimen is always indicated to rule out malignancy, because thoracic actinomycosis may occur as a secondary infection in malignancies [8]. The most appropriate procedure for obtaining an accurate diagnosis is surgical biopsy, which is usually limited to diagnostic purposes; however, a combined medical-surgical approach has been reported as a therapeutic means for complicated pulmonary, abdominal or central nervous system disease.

Prolonged antibiotic treatment is the key to the cure of actinomycosis. The appropriate and almost always "ultimate" agent is penicillin G, or, alternatively, tetracyclines and/or clindamycin for penicillin-allergic patients [9], for at least 6 months. In the present case, the patient was initially treated with penicillin G, which was discontinued and replaced by doxycycline 3 weeks later because of the development of leukopenia.

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