International Journal of Medical Case Reports and Reviews
2024 Volume 3, Issue 4
DOI: 10.59657/2837-8172.brs.24.050

BioRes Scientia
Value your Research

Case Report

Open Access

Thoracic Actinomycosis Masquerading as Malignancy: A Case Report

F. Lamouime[1]*, M. Rhaouti[1], M. Lakranbi[1,2], Y Ouadnouni[1,2], M Smahi[1,2]

[1]*Department of Thoracic Surgery, CHU Hassan II-Fès, Morocco.*

[2]*Faculty of Medicine and Pharmacy, Sidi Mohamed Ben Abdellah University, Fès, Morocco.*

**Corresponding author: F. Lamouime.*

Abstract

Actinomycosis is a rare, specific, non-contagious bacterial infection characterized by purulent and granulomatous manifestations. It often presents challenges in diagnosis, with thoracic localization mimicking tuberculosis or cancer. We present the case of a 38-year-old chronic smoker admitted for the evaluation of a left anterior chest wall tumor. Clinical and radiological assessments revealed two left anterior parietal masses with pleuropulmonary invasion. Histological examination confirmed actinomycosis, prompting antibiotic therapy with intravenous Penicillin G followed by protected amoxicillin. The patient exhibited a positive clinical response. Thoracic actinomycosis, though benign, poses diagnostic challenges due to its deceptive radio-clinical presentation. Anatomopathological study becomes crucial to identify characteristic signs. The primary management involves tailored medical treatment. Actinomycosis should be considered a diagnosis of exclusion, especially when ruling out common causes of thoracic wall swellings.

Keywords: thoracic; infection; cervicofacial; non-contagious; radiological

Introduction

Actinomycosis is a specific, rare, and non-contagious bacterial infection, often chronic and predominantly affecting the cervicofacial region. It manifests as à purulent and granulomatous condition caused by Gram-positive anaerobic bacteria. Thoracic involvement accounts for 15% to 30% of reported cases. The prevalence has decreased with improved socioeconomic conditions and the advent of antibiotic therapy. Thoracic actinomycosis typically occurs in individuals with weakened immune systems. The clinical and radiological presentation is deceptive and can mimic bronchopulmonary cancer or pulmonary tuberculosis.

Observation

A 33-year-old chronic smoker presented with a two-month history of left anterior chest pain, non-radiating, accompanied by a cough producing mucous expectorations occasionally streaked with blood. The patient also reported two progressively enlarging masses located retro-mammary and at the left base of the thorax, along with unspecified weight loss. Clinical examination revealed poor oral hygiene and inflammatory signs associated with the two retro-mammary and left basithoracic swellings, without other associated symptoms. Biological assessment showed neutrophil-predominant leukocytosis with a count of 12,000. Sputum examination for Koch's bacillus was negative, and serologies for HIV, HBV, HCV, and syphilis were also negative. Frontal chest X-ray revealed no abnormalities. Radiological investigations, including thoracoabdominal CT scan, indicated a soft tissue lesion in the left thoracic wall causing rib destruction with ipsilateral pleuropulmonary and mediastinal involvement. Signs of carcinomatous lymphangitis and mediastinal lymphadenopathy were noted. Additionally, another soft tissue lesion was observed in the left hypochondrium Figure 1.

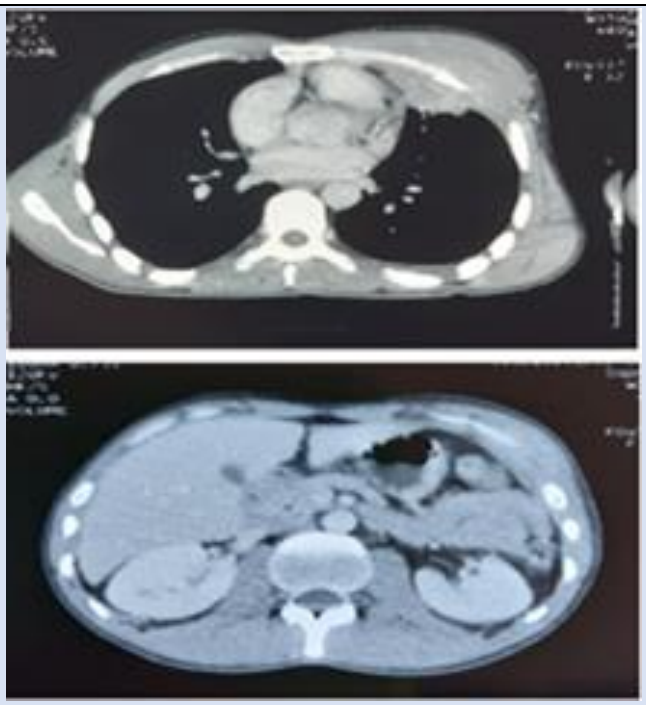

Figure 1: Two CT scan sections illustrating two invasive lesions, one affecting the left thoracic soft tissues, leading to costal lysis with ipsilateral pleuro-pulmonary and mediastinal involvement, and the other involving the soft tissues of the left hypochondrium.

Thoracic MRI revealed two soft tissue processes involving the left anterior thoracic wall, hypointense on T1 and hyperintense on T2, enhancing post-contrast. These measured 61*26 and 32*19 mm, infiltrating the left pectoralis major muscle, extending into the pre- and retro-pectoral spaces, infiltrating the costal cartilages, intercostal and pleural spaces, with pleural effusion and adjacent pulmonary consolidation. (Figures 2,3 and 4).

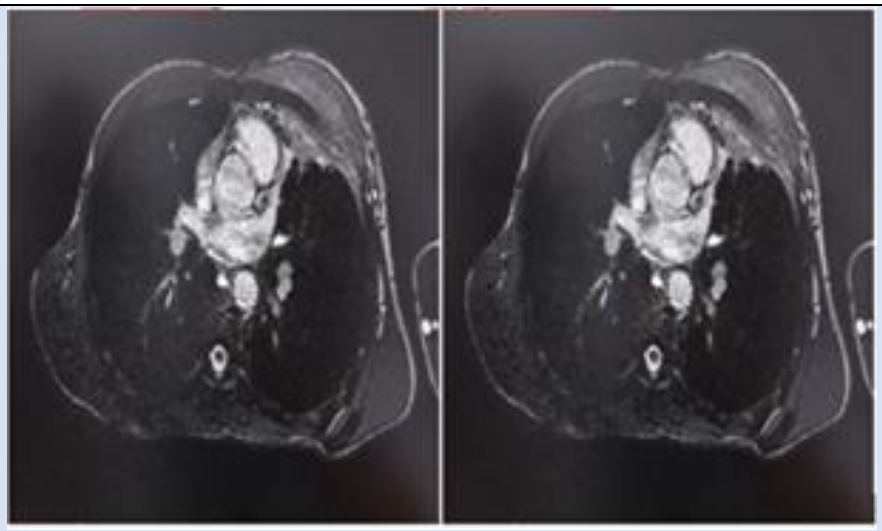

Figure 2: Two axial sections in T1 FATSAT-weighted sequence revealing an invasive tissue process of the left thoracic wall with hypointensity.

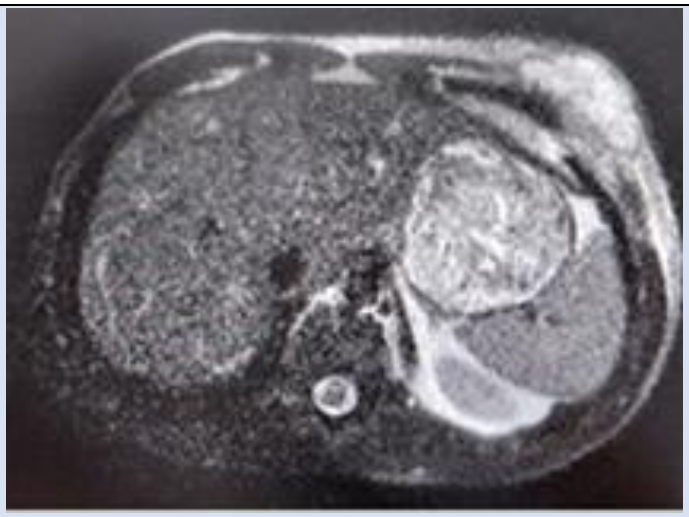

Figure 3: Axial section in T2-weighted sequence illustrating a lesion with hypersignal in the soft tissues of the left hypochondrium.

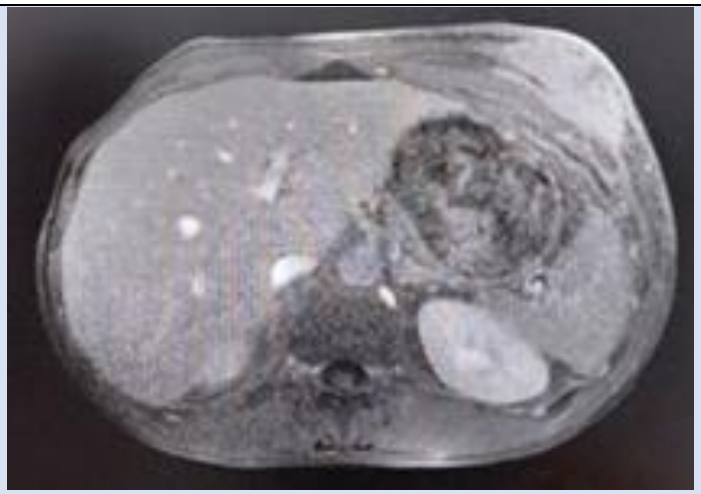

Figure 4: Axial section in T2-weighted sequence demonstrating a lesion with hypersignal in the soft tissues of the left hypochondrium.

Histopathological examination, following an initial inconclusive trucut biopsy, revealed no signs of malignancy or tuberculosis. A second surgical biopsy confirmed actinomycosis, with positive special stains for "PAS" and "GRAM." (Figures 5,6 and 7).

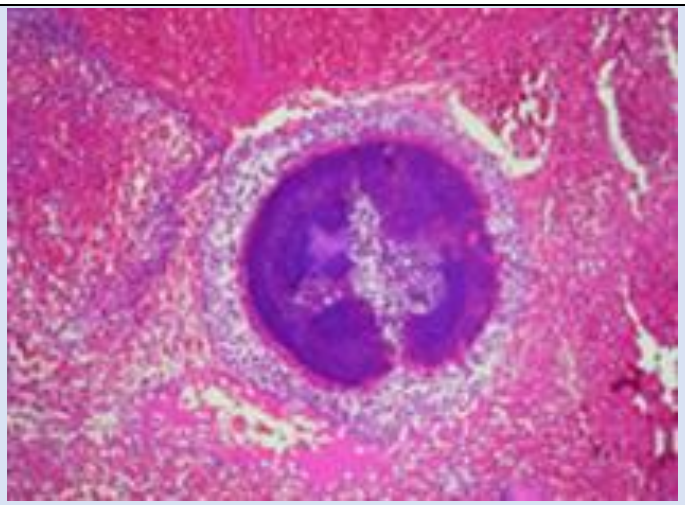

Figure 5: Actinomycosis: Clusters of thick, basophilic, filamentous, short, and non-septated organisms (X40).

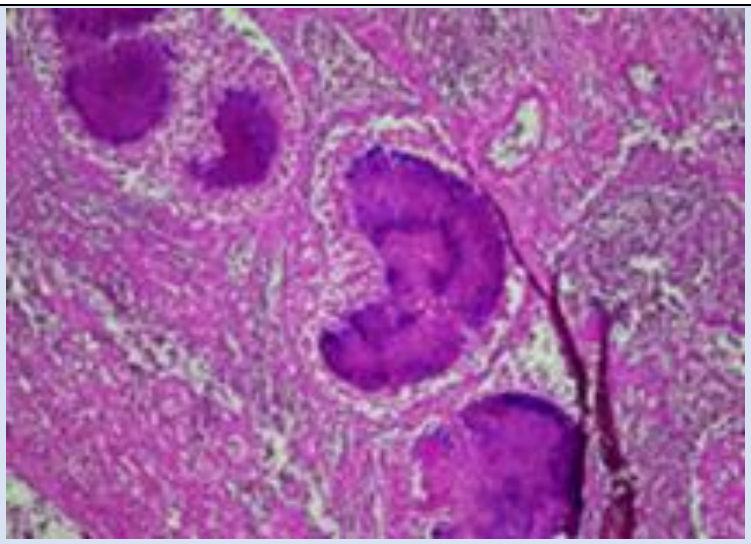

Figure 6: Actinomycosis: Zone of fibrosarcomatous transformation deep within, exhibiting a fishbone architecture (x10).

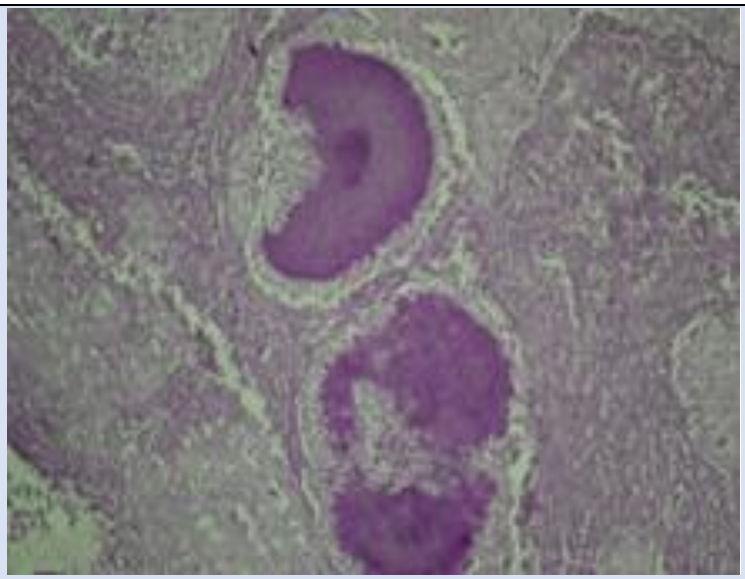

Figure 7: Actinomycosis: GRAM STAINING OF Clusters of microorganisms (X40).

Treatment involved intravenous Penicillin G at 10 million units per day for two weeks, followed by oral amoxicillin-clavulanate at 3 grammes per day for 6 months.

The patient demonstrated a favorable clinical evolution marked by weight gain, reduction in the size of the two masses, and alleviation of pain.

Patient Consent

The patient provided informed consent.

Discussion

Actinomycosis is an infectious disease caused by filamentous anaerobic bacteria of the order Actinomycetales, belonging to the class Actinomycetes, the family Actinomycetaceae, and the genus Actinomyces [1]. Contrary to what the term "actinomycosis" might suggest, it is not a mycotic infection but rather a bacterial infection caused by saprophytic bacilli present in the natural cavities of the human body. There are 14 species, of which six can be responsible for diseases in humans. The flagship species is A. israelii, most commonly recognized in thoracic actinomycosis [1]. The typical mode of contamination is endogenous, with mucosal rupture serving as the primary step in the progression towards pathogenicity. Examples include instances where actinomycosis occurs following dental procedures, trauma, surgery, or aspiration [2]. Actinomycosis predominantly impacts adults aged 20 to 60, with a peak incidence around 40 years old. Its occurrence is less frequent in children, accounting for fewer than 10% of reported cases, and typically presenting between the ages of 3 and 6. The scarcity of this condition in children is attributed to prompt dental caries treatment, the natural loss of teeth, and the absence of periodontal diseases [3]. Facial localization is the most common, accounting for 55%

of cases, while abdominal-pelvic forms represent 20% of cases. Thoracic forms represent 15–20%, and can involve the pleura, mediastinum, or thoracic wall [4]. The occurrence of actinomycosis seems to have decreased over the last four decades, accompanied by less severe clinical manifestations, a trend likely influenced by improved hygiene practices. Thoracic involvement ranges from 15% to 50% across various studies [4]. Thoracic actinomycosis can manifest at any age, with a peak incidence between 40 and 50 years. The infection is 2 to 4 times more prevalent in males than females and is higher in individuals with chronic respiratory conditions like chronic obstructive pulmonary disease or bronchiectasis. Immunocompromised patients exhibit a clinical presentation similar to that of immunocompetent individuals, responding comparably to antibiotic treatment [5]. Pulmonary actinomycosis is likely a result of aspirating infected secretions from the oropharynx or gastrointestinal tract [6]. While poor oral hygiene or a diaphragmatic breach can elevate the risk [1]. hematogenous or lymphatic mediastinal dissemination is not uncommon, explaining the observed parietal localization in our patient. Clinically, the presentation frequently resembles that of a malignant tumor, showing a gradual increase in volume along with low-grade fever and weight loss. In our patient, the initial presentation closely resembled that of an invasive pleuropulmonary tumor [6]. From a biological perspective, one can observe, at most, a slight increase in white blood cell count, possibly associated with normochromic anemia. The erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels are moderately elevated. Imaging sometimes aids in guiding the diagnosis, specifying the extension, and monitoring the effectiveness of antibiotic treatment. Thoracic radiography, in fact, reveals nonspecific images ranging from pulmonary infiltration to cavitary images, occasionally accompanied by pleural and parietal opacities or vertebral invasion [7]. Computed tomography (CT) and thoracic magnetic resonance imaging (MRI) offer limited diagnostic value. However, they can provide guidance by revealing rib erosion or signs of osteomyelitis on bone windows. While the presence of mediastinal lymphadenopathy, nodular infiltrate, cavitations, and pleural effusion does not exclude the possibility of actinomycosis, the combination of these signs with thoracic wall involvement is highly suggestive. Pulmonary isotopic uptake foci have been reported anecdotally, making this examination unreliable for diagnosing actinomycosis [8]. The conclusive diagnosis involves isolating the microorganism from the punctured or spontaneously discharged pus and cultivating it. Histological analysis reveals a granuloma centered around an abscess where colonies of actinomycetes are present, often in conjunction with other bacteria. These actinomycetes form grains of varying visibility on H&E staining but are distinctly stained with Gram, Grocott, and PAS stains. The grains exhibit diverse sizes and are bordered by filaments of irregular length, consistently with a diameter less than 1 micron. However, their presence is variable [8]. Infiltration of polymorphonuclear cells, histiocytes, and giant cells may be observed. The sulfur granule or yellow granule, visible to the naked eye, is located at the center of tissue abscesses. It appears whitish-yellow, with a diameter ranging from 10 to 30 µm, composed of macrocolonies of Actinomyces israelii agglutinated within a polysaccharide-protein complex comprising 50% calcium [9]. If not addressed, thoracic actinomycosis follows a subacute course, resulting in lesion excavation, contiguous extension, and the destruction of surrounding tissues, with potential implications for prognosis [9]. This progression may manifest as osteomyelitis, empyema, and, notably, invasion of the thoracic wall, presenting as one or more parietal masses that progressively increase in size, resembling a neoplastic condition. The development of parietal involvement eventually leads to fistulization towards the skin. The treatment for thoracic actinomycosis is comparatively lengthier than for other forms. It involves the parenteral administration of penicillin G at a daily dose ranging from 10 to 20 million units for 2 to 6 weeks. This is followed by oral administration of penicillin V or amoxicillin, with a dosage of 2 to 4 grames per day for 6 to 12 months, as relapses are possible even with meticulous and systematic dental treatment [10]. The appropriateness of surgical intervention remains a subject of debate and may be considered in suspected cases of bronchial carcinoma. In such situations, obtaining an intraoperative diagnosis through immediate histological examination assists in minimizing the extent of excision. When a preoperative diagnosis has been established, specific procedures may be warranted, including the drainage of large abscesses with empyema, debridement of fistulous tracts, excision of irreversibly damaged parenchyma (such as atypical resection, segmentation, lobectomy, or rarely pneumonectomy). Additionally, for cases displaying suboptimal response to medical treatment, such as persistent hemoptysis, there may be

a need for pleural decortication following antibiotic therapy for pleuroparenchymal forms [10].

Conclusion

Diagnosing thoracic actinomycosis poses à challenge due to its misleading clinical and radiological presentation, often resembling tuberculosis or cancer. Therefore, the importance of histopathological examination in identifying specific signs of actinomycosis cannot be overstated. The preferred therapeutic strategy mainly involves medical management, and invasive procedures are generally not required when initiated promptly.

References

1. Sebald M. (1996). Actinomycoses à bactéries anaérobies. Ecycl Med Chir. 8:6.
2. Wilson.R, Sande.M, Drew A, STAT W.L. (2001). «Currentdiagnosis&treatment in infectiousdiseases» New york: Lange Medical Books/McGraw-Hill.
3. Msougar Y, Fenane H, Maidi M, Benosman A. (2013). L'actinomycose thoracique multiple chez l'immunocompétent. *Pan Afr Med J*, 16 :1-5.
4. Souadka A, Ouadfel J, Jalil A, Benjelloun S. (1992). L'Acctinomycose Abdominale Pseudotumorale à propos de deux cas. Médecine du Maghreb, 39.
5. Hall.V. (2007). « Actinomyces-Gatheringevidence of humancolonization and infection » Anaerobe Reference Unit.
6. Molina E, Delhom E, Gallix B, Bruel J.M. (2005). Colites infectieuses, iatrogènes et autres colites rares. Ecycl Med Chir (Elsevier, Paris). Radiodiagnostic Appareil Digestif, 33-430-A-70.
7. Webb WR, Sagel SS. (1982). Actinomycosis involving the chest wall: CT findings. AJR, 139:1007-1009.
8. Hoekstra CJ, Hoekstra OS, Teengs JP, Postmus PE, Smit EF. (1999). Thoracicactino mycosis imaging with fluorine-18 fluorodeoxyglucose positron emission tomography. Clin Nucl Med, 24:529-530.
9. Garner J.P, Macdonald M, Kumar P.K. (2006). Abdominal Actinomycosis. International Journal of Surgery, 20:1-8.
10. Park JY, Lee T, Lee H, Lim HJ, Lee J, Park JS, et al. (2014). Multivariate analysis of prognostic factors in patients with pulmonary actinomycosis. BMC infect Dis, 14 :1-7.

Cite this article: F. Lamouime, M. Rhaouti, M. Lakranbi, Y. Ouadnouni, M Smahi. (2024). Thoracic Actinomycosis Masquerading as Malignancy: A Case Report. International Journal of Medical Case Reports and Reviews, BioRes Scientia Publishers. 3(4):1-6. DOI: 10.59657/2837-8172.brs.24.050

Article History: **Received:** March 11, 2024 | **Accepted:** March 28, 2024| **Published:** May 06,2024