

A fine line between a major surgery and medical therapy: the diagnosis of sternal tuberculosis

Majör cerrahi ile ilaç tedavisi arasındaki ince çizgi: Sternum tüberkülozu tanısı

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Tuberculosis involving the sternum is rare. The most common symptoms at the early stage are chest pain and palpable masses on the sternum. Cutaneous fistulas, spontaneous fracture of sternum and extrasternal spread may develop in cases with late diagnosis. In this article, we report a 53-year-old male case admitted with a one-month history of chest pain and two palpable masses on his lower sternal part of chest in whom the diagnosis of sternal tuberculosis was confirmed by histopathologically and microbiologically. The masses were reduced in size with two-month anti-tubercular therapy. The nine-month duration of the therapy produced satisfactory results without any adverse reactions.

Key words: Osteomyelitis; sternum; tuberculosis.

Sternal osteomyelitis due to tuberculosis (TB) is a clinical rarity that makes up 1-3% of all cases of osteoarticular TB.^[1] Herein, we describe a case of sternal TB in a previously healthy man without any known risk factors, such as cardiothoracic surgery, human immunodeficiency virus (HIV) infection, intravenous drug abuse, trauma, or a recent bacille Calmette-Guérin (BCG) vaccination. In addition, he had no extrasternal involvement. The suspected diagnosis was confirmed by a histological examination and the growth of *Mycobacterium tuberculosis* on culture.

Tüberküloz, sternumu nadiren tutmaktadır. Erken dönemde en sık görülen semptomlar göğüs ağrısı ve sternum üzerinde ele gelen kitlelerdir. Tanısı gecikmiş olgularda kütanöz fistüller, sternumda spontan kırık ve sternum dışı yayılım görülebilmektedir. Bu yazıda, bir aydır devam eden göğüs ağrısı ve sternum alt ucunda ele gelen kitleler ile başvuran ve histopatolojik ve mikrobiyolojik olarak sternum tüberkülozu tanısı kesinleşen 53 yaşında bir erkek olgu sunuldu. Kitleler iki aylık antitüberküloz tedavisi ile küçüldü. Dokuz aylık tedavi süreci, herhangi bir yan etki görülmeden tatminkar sonuçlar verdi.

Anahtar sözcükler: Osteomyelit; sternum; tüberküloz.

CASE REPORT

A 53-year-old man presented with a one-month history of chest pain and two distinct palpable masses on his lower sternal part of his chest. He was a teacher who was living in a village in the Black Sea region of Turkey and had no symptoms. However, he had a history of pulmonary TB that had been treated 36 years earlier. Previously, he had been admitted to a local hospital with the same complaints, and an ultrasound had revealed a 4x2 cm hypoechoic, septated abscess localized to the left side of the distal sternum. In addition, non-contrast-enhanced computed



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Figure 1. Non-contrast-enhanced computed tomography showing the soft tissue mass eroding the sternum.

tomography (CT) of the thorax had demonstrated a 6.7x4.2 cm lobulated soft tissue mass that was eroding the sternum (Figure 1). However, ultrasound-guided fine needle aspiration (FNA) had yielded no microorganisms, and the cytology had revealed polymorphonuclear leucocytes.

Afterwards, the patient was admitted to our hospital for extensive surgery to remove the mass. Pus drainage from the needle insertion area was seen on an examination, but the remaining physical examination was normal. An anteroposterior chest radiograph showed no abnormalities with the lung

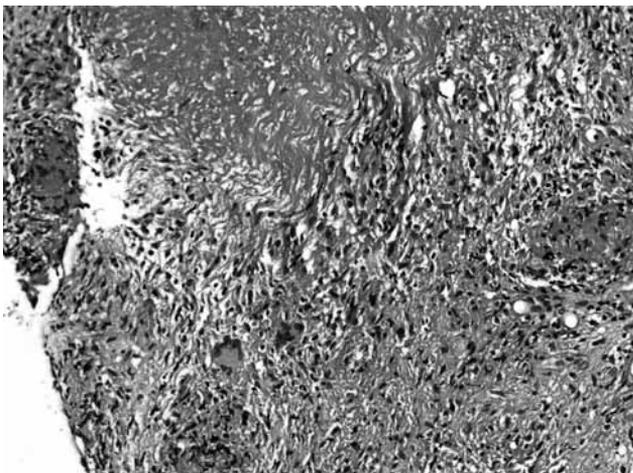


Figure 2. At high magnification, the Langhans giant cells can be viewed next to the central caseation. These cells are formed by the fusion of epitheloid cells and contain nuclei arranged in a horseshoe-shaped pattern in the cell periphery (H-E x 20).

parenchyma or bone structures. Sternal tuberculosis was suspected as the first priority in a differential diagnosis; therefore, local debridement of the infected tissue and punch biopsies from the sternum were performed under local anesthesia.

Amoxicillin-clavulonate was given for ten days because of the growth of methicillin-sensitive *Staphylococcus epidermidis*, and he was discharged from the hospital on the postoperative third day. Furthermore, isoniazid, rifampin, ethambutol, and pyrazinamide were started when the histopathological examination suggested the presence of TB on the postoperative eighth day (Figure 2). *Mycobacterium tuberculosis*, which was not seen microscopically via acid-fast staining, was cultured from a biopsy specimen on the 15th day using the BACTEC™ 460TB system (Becton Dickinson, Heidelberg, Germany), and on the 25th day using Lowenstein-Jensen medium. The antitubercular drug susceptibility test also revealed no resistance. By the end of two months of treatment, the masses were reduced in size, and there was no drainage. The four-drug anti-tuberculous treatment was then switched to a two-drug regimen of isoniazid and rifampicin. In the follow-up period, the anti-tuberculous therapy was well tolerated, and no adverse reactions, such as elevated liver enzymes, were seen. Control contrast-enhanced CT of the thorax was repeated at the end of the therapy, and it did not detect any remaining



Figure 3. Contrast-enhanced computed tomography showing the centrally calcified and non-calcified nodules on the subcutaneous fat tissue. The soft tissue mass eroding the sternum had disappeared.

mass, and it showed centrally calcified and non-calcified nodules of less than 1 cm in diameter on the subcutaneous fat tissue near the left lateral distal part of the sternum (Figure 3). After nine months, the treatment with isoniazid and rifampin was discontinued.

DISCUSSION

The Turkish Ministry of Health declared that TB of the bones and joints, excluding the vertebra, made up 4% of all extrapulmonary TB cases in 2009.^[2] However, the distribution of bone and joint involvement was not detailed in this report, so no data is available regarding sternal TB. Generally, osteoarticular TB involves the weight-bearing joints and bones such as the hips, knees, and vertebra. The report also noted that tuberculous osteomyelitis of the sternum was an infrequent occurrence, with only five of forty cases in the literature being from Turkey.^[3-7]

Similar to our case, constitutional symptoms are uncommon in sternal TB, and pain and swelling over the sternum were the only symptoms our patient had that were in accordance with previous cases.^[1,3-7] In addition, there are two different observations about gender predilection. Sapmaz et al.^[3] reported that there is no gender predilection associated with this disease, whereas Günay et al.^[6] advocated male predominance in tubercular sternal osteomyelitis. Our patient is representative of a typical case of sternal TB featuring a clinical picture of a middle-aged male living in a country where TB is endemic. Unlike the previous cases, our patient had no underlying risk factors and no immunosuppressive diseases. For example, he had no HIV infection or DM and had not undergone open heart surgery. Neither had he received a BCG vaccination or suffered from intravenous drug addiction.^[1,7]

Radiological imaging is essential in the diagnosis of osteomyelitis, but it is not helpful by itself in the differential diagnosis of pyogenic and tuberculous forms of this disease.^[3] Atasoy et al.^[5] reported that thoracic CT is not superior to lateral radiographs of the sternum for diagnosing tubercular sternal osteomyelitis, but CT does provide the opportunity to evaluate the lung parenchyma, mediastinum, and soft tissue for tubercular involvement. According to the same study by Atasoy et al.,^[5] magnetic resonance imaging (MRI) is a better option for differentiating between sternal osteomyelitis and peristernal soft tissue infection as well as for viewing earlier abnormalities in the bone marrow. In our case,

no abnormalities were seen in the lung parenchyma on a normal anteroposterior chest radiograph. Our patient did not have a lateral X-ray of the sternum, but both the CT image of the soft tissue mass eroding the sternum and the clinical picture had given rise to the suspicion of sternal osteomyelitis.

A histopathological examination revealed the diagnosis of TB in our case based on the caseous granulomatous reaction composed of epithelioid cells and Langhans giant cells.^[1,4-6] Furthermore, the cultures of both the Lowenstein-Jensen medium and BACTEC™ 460TB system grew *Mycobacterium tuberculosis*.

There are two ways to treat tubercular sternal osteomyelitis. One option is anti-tuberculous chemotherapy, and the second option is for the patient to undergo the chemotherapy in combination with surgery. The surgery may be minor, or it can involve extensive debridement of the bone and/or surrounding muscle resection. In that case, reconstructive surgery is also necessary.^[1,3-7] The Turkish Ministry of Health recommended nine months of anti-tuberculous therapy for osteoarticular TB in the Guideline of Tuberculosis Diagnosis and Therapy published in 2011.^[8]

Mycobacterium tuberculosis was found to be resistant to isoniazide in one previous case in Turkey.^[3] Our patient had sternal TB with sternal tuberculosis was treated with quadruple drug therapy for the first two months and then with only two drugs, with all of the drug therapy being completed after nine months. An antituberculous drug susceptibility test yielded no resistance, and the case was treated without any complications. Our patient was fortunate because of the early suspicion of tuberculous osteomyelitis preoperatively as a result of a consultation regarding disease. We only needed to perform minor local surgery to confirm the diagnosis of TB, and extensive major surgery necessitating reconstruction was not needed.

In conclusion, sternal TB should be kept in mind in the differential diagnosis of a mass involving the chest wall, particularly in endemic areas. This approach will prevent patients with sternal TB, which often mimicks a tumoral lesion, from undergoing unnecessary major surgery.

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