Case study

Sternal Tuberculosis: About Two Senegalese Cases

ABSTRACT

Tuberculosis (TB) remains a major public health problem in resource-limited countries where it is endemic. Sternal TB is a rare entity. It accounts for less than 1% of tuberculous osteomyelitis.

We report two cases of sternal TB occurring in two young Senegalese aged 21 and 23, who presented with inflammatory sternal swelling in the context of evening raise of temperature and weight loss. In both cases, *Mycobacterium tuberculosis* was detected in the pus specimen using the Genexpert® MTB/RIF test (Cepheid, California). In one case, a chest CT scan revealed lysis of the sternal manubrium. The patient's condition improved with anti-tuberculosis treatment and surgery.

These cases, particularly in areas where tuberculosis is endemic, highlight the importance of considering tuberculosis as a possible cause of sternal tumefaction.

Keywords: Tuberculosis; sternum; Saint-Louis; Senegal.

1. INTRODUCTION

Tuberculosis (TB) is a major health problem affecting a quarter of the world's population. According to the World Health Organization's 2022 report, 10.6 million people were infected and 1.6 million died [1]. Pulmonary TB is the most common form and is highly contagious [1]. Sternal TB is rare. It accounts for only 1% of osteoarticular TB cases [2, 3]. It often affects young adults in TB-endemic areas [4], mainly due to sternotomy, BCG vaccination and immunosuppression [5]. It usually follows haematogenous or lymphatic spread of a contiguous parenchymal or mediastinal focus [5, 6].

Clinically, it is suspected in cases of unexplained sternal pain with or without swelling of the thoracic wall [2, 6]. The diagnosis is made on the basis of the anatomopathological analysis of tissue and/or bacteriological samples [7]. Imaging is used to assess the extent of the lesions. Management includes medical and surgical treatment [3].

We report two cases of sternal TB in two young Senegalese men, aged 21 and 23 years, with good outcomes under medical and surgical treatment.

2. CASE PRESENTATION

2.1. Case1

The patient, a 23-year-old man with no significant past medical history, was admitted to the medical department of the Regional Hospital Center of Saint-Louis (Senegal) because of sternal swelling, cough, evening raise of temperature, and weight loss. The onset of the symptoms was two months ago, marked by the appearance of a warm, painful, progressively increasing, soft sternal swelling without fistula. Then he developed a productive, hacking cough and expectoration of whitish, non-bloody sputum. All this occurred in the context of evening raise of temperature, night sweats, unquantified weight loss, physical asthenia and non-selective anorexia. Coughing was infrequent and had no fixed schedule or precipitating or alleviating factors. Upon admission, physical examination revealed a large 20cm sternal tumefaction (Fig. 1), bilateral pulmonary condensation syndrome and systemic inflammatory response syndrome. The sternal tumefaction was aspirated, and the pus obtained was positive for *Mycobacterium tuberculosis* without rifampicin resistance, as confirmed by Genexpert® MTB/RIF (Cepheid, California). The CT scan of the chest showed a large, anterior, piriform, homogeneous parietal collection with partial lysis of the right side of the sternal manubrium and a diffuse micronodular infiltration suggestive of haematogenousmiliary TB (Fig. 2). Complete blood count, HIV serology, fasting blood glucose, liver and kidney function were normal. The C-reactive protein was114 mg/L. The diagnosis was pulmonary (miliary) and sternal TB. The patient was treated with anti-tuberculosis drugs, vitamin B6, and corticosteroids. Additionally, a surgical drainage of the collection was performed. The patient's condition improved.

Fig. 1. Sternal collection before and after anti-tuberculosis treatment of case 1

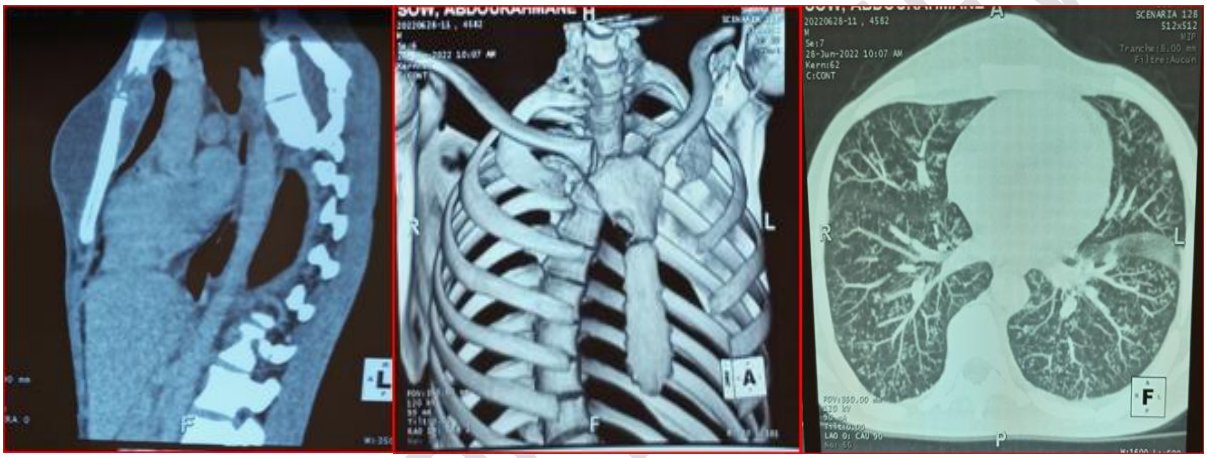

Fig. 2. CT images of the collection, lysis of the sternal manubrium and hematogenous miliary of case 1

2.2. Case 2

The patient, a 21-year-old man with no significant medical history, was admitted to the medical department of the Regional Hospital Center of Saint-Louis (Senegal) because of sternal swelling, evening raise of temperature, and weight loss. The symptoms began a month ago, marked by the appearance of a warm, painful, progressively increasing, soft swelling above the xiphoid process, without fistula (Fig. 3). The patient reported evening raise of temperature, night sweats, physical asthenia and unexplained weight loss. Upon admission, a large swelling of approximately 10 cm in diameter was found in the sternum area. His lung was clear and other systems and organs were normal. The tumefactionwas aspirated, and the pus obtained was positive for *Mycobacterium tuberculosis* without resistance to rifampicin using the Genexpert® MTB/RIF (Cepheid, California). The diagnosis of

sternal tuberculosis was confirmed. The haemogram, fasting blood glucose, liver and kidney functions were normal. The C-reactive protein was6mg/L. The HIV serology was negative. The chest X-ray revealed a right paracardiac infiltrate. The patient was treated with anti-tuberculosis drugsand vitamin B6. The parasternal collection was surgically drained. The patient's condition improved.

Fig. 3. Sternal collection before and after anti-tuberculosis treatment of case 2

3. DISCUSSION

Sternal tuberculosis is a rare condition, accounting for 1% of osteoarticular tuberculosis cases [2, 3]. It often develops following sternotomy, BCG vaccination, immunosuppression (particularly due to HIV) [5],thalassemia, or miliary tuberculosis. The latter factor was found in case1. It can also be found in drug addiction[5]. Sternal TB seems to be more common in men (both our cases were male) and can occur at any age [8, 9].Tuberculosis (TB) primarily affects immunocompromised individuals, although a few cases have been reported in immunocompetent patients. In our two patients, immunosuppression was ruled out by negative test results [10]. In the literature, sternal TB typically occurs in individuals aged between 40 and 50 years [10]. However, in our study the patients were young adults aged 21 and 23 years. Feki and al. (2010) reported a case of sternal TB in a 25-year-old immunocompetent female patient [10].

It can result from hematogenous or lymphatic dissemination from a mediastinal lymph node or contiguous parenchymal focus [5, 6].It may be isolated or in

association with other sites such as the ribs or clavicle [2, 6]. Sternal TB typically presents as chronic osteitis with delayed diagnosis [11, 12].

Clinically, it is characterized by sternal pain with or without swelling of the thoracic wall that slowly worsens [12].If left untreated, abscesses may form in the soft tissues. These may develop into fistulas or spread to the mediastinum or pleural cavity, with a risk of pathological fracture of the sternum [3, 6, 12].

Medical imaging is used to assess the extent of the lesions. Radiological findings of bone lysis or soft tissue infiltration are not pathognomonic of sternal TB. They may be indicative of a primary malignant bone tumour (such as Ewing's sarcoma or chondrosarcoma), a secondary tumour or a malignant haematopathy. Definitive diagnosis is made by bacteriological and/or histological analysis of a bone biopsy or the abscess wall [3, 13, 14].In both cases, the diagnosis of TB was confirmed by isolation of *Mycobacterium tuberculosis* from the pus using Genexpert® MTB/RIF (Cepheid, California). The management of sternal TB includes medical and surgical treatment. Medical treatment involves four-drug anti-tuberculosis therapy [3]for at least one year [15]. Only one out of 18 patients in Faure and al.'s series was successfully treated with anti-tuberculosis drugsalone [16]. Similarly, in Hsu and al.'s series, only one patient was successfully treated with anti-tuberculosis drugs alone, while the remaining patients received both medical and surgical treatment [17]. Based on this evidence, many authors recommend combining medical and surgical treatment for all cases of thoracic tuberculosis [16, 18, 19]. Surgical treatment involves drainage, debridement of the abscess and bone curettage [3]. In our series, surgical debridement without bone curettage was performed on both of our patients in combination with anti-tuberculosis drugs. In Majeed and al's series, 7 patients with sternal tuberculosis underwent abscess debridement with partial sternal excision [20]. Bone curettage may reduce the relapse rate. In fact, in a study by Paik HC et al, the relapse rate in the group that underwent abscess excision with bone curettage was lower (1.6%) than the relapse rate in the group that underwent abscess excision alone (16%) [21]. However, in our study, although bone curettage was not performed, no relapse was observed.

In the absence of treatment, the following complications may occur: infection, fistulation, spontaneous fracture of the sternum, vascular compression or erosion, tracheal compression and extension to adjacent structures (mediastinum, pleura, subcutaneous tissues) [6].

4. CONCLUSION

Sternal TB is a rare condition that should be considered in the presence of any lytic lesion of the sternum, with or without a parietal collection. Thoracic imaging is useful to help diagnose the lesion and to assess extension. The Genexpert® MTB/RIF (Cepheid, California) has made the diagnosis easier. Medical and surgical management results in good clinical outcome.

CONSENT

The authors state that the patients have given their informed consent for the publication of their clinical cases.

ETHICAL APPROVAL

It is not applicable.

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