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# Diagnostic challenges in a patient with myocardial tuberculoma: A case report



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## ABSTRACT

**INTRODUCTION:** Tuberculosis can affect any organ of the body, including the heart.

**PRESENTATION OF CASE:** An 18-year old woman presented with a multifocal tuberculosis infection involving abdominal lymph nodes, a sternotomy wound, an abscess of the abdominal wall and most notably a myocardial tuberculoma. Establishing the diagnosis of the myocardial tuberculoma was challenging mainly due to the location within the heart. Initially a diagnostic percutaneous femoral vascular catheter guided biopsy of the right atrial mass was performed, but later open surgery involving median sternotomy was needed. The patient recovered fully after surgery and nine months treatment with anti-tuberculosis drugs.

**DISCUSSION:** The optimal length of treatment for myocardial tuberculoma is unknown. Medical treatment for six months might be enough regardless whether surgery is performed or not.

**CONCLUSION:** Myocardial tuberculoma requires culture from the infected tissue for confirmed diagnosis and might be successfully treated with anti-tuberculosis drugs only. Indications for surgery include uncertain diagnosis, poor response to medical treatment or cardiac complications.

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## 1. Introduction

Tuberculosis (TB) is one of the major infectious diseases causing approximately 1.5 million annual deaths worldwide, mainly in areas where proper diagnostics and optimal treatment is insufficient [1]. TB typically affects the lungs, but any organ in the body can be infected. Cardiac involvement is rare, except for pericarditis [2]. Here we present a case of a slowly progressing right atrial mass which was confirmed as a tuberculoma after extensive investigation including transvenous catheter guided biopsy as well as culture from an intraoperative biopsy. This case report is in accordance to the SCARE guidelines [3].

## 2. Presentation of case

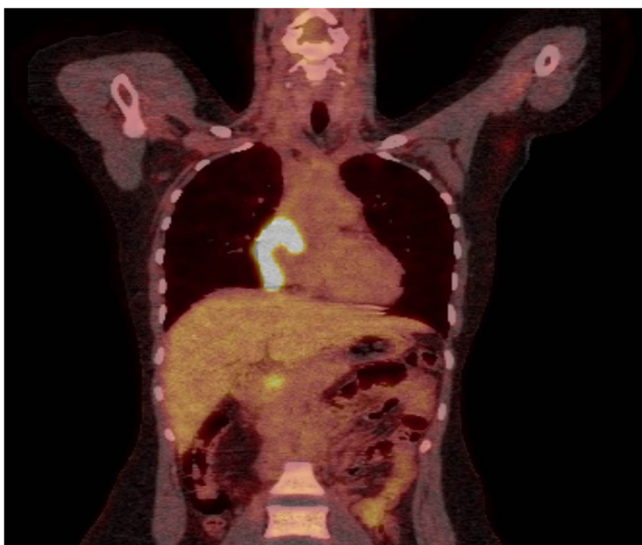
An 18-year old woman of Somalian origin was admitted with a two-months history of fatigue, poor appetite and unspecific body pain, but without fever or cough. Four months previously she arrived in Sweden. She was immunocompetent and previously healthy except for a skeletal mass on the sternum and right clavicle at the age of seven. It was considered as skeletal TB, and anti-tuberculosis treatment was given for six months without any effect.

On initial admission, blood tests showed signs of mild inflammation with ESR 49 mm and CRP 16 mg/L. Other routine blood tests including blood cell count, liver function tests and creatinine were normal as was the chest x-ray. A purified protein derivate (PPD) skin test was 17 mm, indicating TB-exposure. A CT scan of the chest and abdomen didn't show any conclusive pathological findings, therefore an 18-fluorodeoxyglucose positron emission tomography and computed tomography (FDG-PET/CT) was performed. This revealed inflammation in a few small abdominal lymph nodes, but more remarkable; a clearly illuminating mass was found in the lateral wall of the right cardiac atrium (Fig. 1). Transthoracic echocardiogram confirmed a 30 × 15 mm mass without any hemodynamic influence. At this point, an active abdominal tuberculosis infection was suspected with the intracardiac mass possibly caused by myxoma, sarcoma or tuberculoma. The abdominal lymph nodes were not accessible for biopsy, without performing a laparotomy.

To take biopsy for culture was important, in part due to previous TB treatment and the consequent risk of resistance. She was therefore referred to another hospital for a diagnostic percutaneous femoral vascular catheter guided biopsy of the right atrial mass. The biopsy itself was successful. By mistake the sample was placed in formaldehyde, with subsequently negative TB culture. Also PCR to detect *Mycobacterium tuberculosis* was negative. Histopathological examination of the sample showed myxoid tissue but also epithelioid cell granuloma, where the latter could indicate tuberculosis among other types of chronic inflammation. Acid-fast stain was negative. At that stage, myxoma was primarily suspected, and open surgical resection was planned.

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**Fig. 1.** FDG-PET-CT revealing a right atrial mass.

The patient was informed by thoracic surgeons and was strongly recommended for operation. However, she declined operation because she had spontaneously improved and she discharged herself from hospital. She had no contact with health care services for about half a year. Induced sputum cultures as well as urine and faecal cultures were later found negative regarding TB. Six months later she was motivated for surgery follow several episodes of atrial fibrillation causing chest pain but no signs of uncompensated heart failure.

At the operation, via median sternotomy, a tumorous mass with macroscopically malignant appearance was seen in the right atrial wall. The surgeons decided to excise around 75% of the mass avoiding radical excision to prevent causing permanent tricuspid valve insufficiency (Fig. 2).

Histopathological examination of the specimen revealed granulomatous inflammation including epithelioid cell granuloma, multinucleated giant cells and small necrotic areas, but no signs of malignancy. Acid-fast stain and PCR for *M. tuberculosis* were negative. Four weeks later, the TB culture showed growth of a fully sensitive strain, and TB treatment was started with isoniazid, rifampicin and pyrazinamide in recommended dosage.

Shortly after confirmation of the TB diagnosis a minor wound infection was found in the proximal end of the median sternotomy. An ordinary wound culture was negative. At the same time, an abscess measuring 2.5 cm in diameter developed in the abdominal wall musculature involving costal cartilage. Culture from the operation wound and the abscess were both positive for *M. tuberculosis*. Thus the diagnosis was active multifocal TB with verified cultures from intracardiac tuberculoma, sternotomy wound and abdominal wall abscess, and with suspected involvement of abdominal lymph nodes.

After two months treatment, inflammatory parameters were normalized which in combination with good clinical response prompted the decision to terminate treatment after 9 months. The decision was supported by a FDG-PET/CT which showed distinct regression of right atrial wall inflammation.

At follow-up, ten months after completion of treatment, the patient was fully recovered with normal inflammatory parameters and without any signs of relapse clinically or on a chest CT scan.

### 3. Discussion

Tuberculosis can involve essentially any organ in the body including all the three layers of the heart. Pericarditis is the most common cardiac manifestation and constrictive pericarditis may result in permanent congestive heart failure despite successful inactivation of the mycobacteria. Endocarditis caused by TB can affect any valve and is seen mainly in combination with miliary TB. Endocardial and myocardial presentations of TB are unusual and documentation is limited to case reports [4]. Myocardial TB can



**Fig. 2.** Excised myocardial tuberculoma.

be divided into three different groups, based on histopathological appearance; miliary form characterized by diffuse muscular infiltration, nodular form with caseous inflammation islets dispersed in the myocardium and tuberculoma which are lesions clearly separated from surrounding tissue [5]. Myocardial tuberculoma has been found in the walls of all heart chambers, and the most common localization tends to be within the right atrium. Multiple lesions can occur, but most case reports describe single lesions [6]. All ages can be affected including infants [7]. The length of time to correct diagnosis has been delayed in cases concerning young patients because these lesions have been considered as myxomas or as congenital malformations.

Tuberculoma can be the sole presentation of active TB but may also be seen together with involvement of other organs or in miliary TB. Clinically, myocardial tuberculoma can occur asymptomatic, but more commonly with general symptoms such as fever, night sweats, nausea, weight loss, malaise and weakness. The most common cardiac symptoms are arrhythmias both ventricular and as in this patient episodes of supraventricular arrhythmia [8,9]. Due to the localization of the tuberculoma, intermittent or permanent obstruction within the chambers may affect hemodynamics [10]. Another complication can occur if necrotic tissue separates from the tuberculoma margins, causing septic embolism [11].

Visual diagnostic tools, especially FDG-PET/CT, magnetic resonance imaging (MRI) and echocardiogram can provide guidance in the work-up of an intracardial mass [12–14]. However, only biopsy for histopathological examination and, most importantly, mycobacterial culture can confirm the TB diagnosis and exclude other differential diagnoses.

Anti-TB drugs are the cornerstone of myocardial tuberculoma treatment and definitive cure has been reported without surgery. Indications for surgery may be uncertain diagnosis, refractory malignant arrhythmias, threatening thromboembolism, hemodynamically significant obstruction or inadequate response to medical treatment [15,16]. In this case, a suspected myxoma indicated surgery.

The optimal length of treatment of myocardial tuberculoma is unknown. Many cases of myocardial TB can probably be successfully treated without surgery using only anti-TB drugs for six months in ordinary dosage.

#### 4. Conclusion

Confirming the diagnosis of myocardial tuberculoma requires culture from the infected tissue. This report adds to the existing literature the information that percutaneous vascular catheter guided biopsy might be useful for obtaining tissue for culture. Myocardial tuberculoma might be successfully treated with anti-tuberculosis drugs only. Indications for surgery include uncertain diagnosis, poor response to medical treatment or cardiac complications.

#### Conflicts of interest

None.

#### Author contribution

Olof Säll: Data analysis, writing the paper

Soon-Ok Cha: Data collection, proofreading the paper

Hans Holmberg: Data collection and analysis, writing the paper

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#### Ethical approval

Ethical review was not needed for this case report.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Guarantor

Olof Säll.

#### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.ijscr.2016.11.004>.

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