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A Vanishing Cardiac Mass

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Abstract

The prevalence of extrapulmonary tuberculosis (TB) is very common in the Middle East; however, myocardial involvement is among the most infrequent manifestations of extrapulmonary TB. We present a young adult who was incidentally found to have a large right atrial tuberculoma, diagnosed by non-invasive cardiac imaging and effectively treated with standard first-line anti-TB treatment, steroids, and anticoagulation. This case is a classical presentation of nodular myocardial involvement of TB, highlighting advantages of advanced imaging, e.g., cardiac magnetic resonance (CMR) and multidisciplinary treatment.

Keywords: Tuberculosis, Cardiac mass, Cardiac magnetic resonance, Saudi Arabia

1. Introduction

Tuberculosis (TB) was thought to spare the pancreatic, thyroid, skeletal muscles, and heart [1], although extrapulmonary TB has been diagnosed in all tissues [2]. The lactic acid secreted by the cardiac muscle activity may play a protective role [1].

In 2020, the Saudi Ministry of Health reported through the most recent statistical yearbook that most TB cases were between 25 and 35 years of age, with male predominance; this has dropped to 5.42 cases per 100,000 from 6.82 since 2016 [3]. Global data shows that the Eastern Mediterranean countries (Saudi Arabia included) have the highest percentage of extrapulmonary TB, along with 24% of new and relapsed cases [4]. Here, we present a case of nodular intracardiac tuberculoma, which was diagnosed and treated successfully without invasive procedures.

2. Case report

A 20-year-old Saudi male, presented to the emergency room (ER) in December 2013, with a slowly growing epigastric, painless swelling for one month. It was found to be associated with infrequent self-limiting palpitations. Otherwise, he was asymptomatic. Physical examination was unrevealing, other than a mild tenderness over the swelling, along with fluctuation.

This investigation was within normal limits, including complete blood count, renal and liver function tests, and electrolytes, along with an erythrocyte sedimentation rate of 20 mm/h, C-reactive protein of 12.7 mg/L, plus a negative human immunodeficiency (HIV) virus screening. His electrocardiogram (ECG) showed sinus tachycardia with right axis deviation, non-specific T-wave abnormalities in the inferior leads and non-specific QRS changes in the chest leads (Fig. 1). Initial ER bedside abdominal ultrasound confirmed the pres-

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ence of a collection in the anterior abdominal wall. A plain chest X-ray showed a small loculated right pleural effusion, attached to the right heart border (Fig. 2). Abdominal and chest computed tomography (CT) revealed a multi-located mediastinal and pleural collections involving the pericardium, penetrating the diaphragm wall, causing another sub-diaphragmatic and an abdominal wall collection without evidence of parenchymal lung disease.

Transthoracic echocardiography (TTE) was done to more precisely assess pericardial effusion, ultimately revealing a large homogenous mass in the right atrium, obstructing the right ventricular inflow (Fig. 3); there were no signs of pericardial disease, given preserved systolic function and no valvular disease.

Cardiac magnetic resonance (CMR) showed a large homogenous mass, measuring 25×48 mm along the lateral, inferior and inferomedial walls of the right atrium with a homogenous signal demonstrating a significant obstruction (Fig. 4, Panels A–C). The T2-weighted signal did not suggest fatty content of the mass or fibrosis in delayed enhancement images. There was another mass with the same signal intensity along the inferior wall of the left ventricle, engulfing the inferior vena cava, without any sign of obstruction.

Positron emission tomography scan was done, showing multiple soft tissue densities with hypermetabolic activity in the anterior mediastinum, in the right pericardial region, the right supra-diaphragmatic area extending to the midline and in

Abbreviation

TB	Tuberculosis
ER	Emergency room
ECG	electrocardiogram
CT	Computed tomography
TTE	Transthoracic echocardiography
CMR	Cardiac magnetic resonance
AFB	Acid-fast bacilli
MTB	mycobacterium tuberculosis
PCR	polymerase chain reaction
ATT	anti-TB treatment
SSFP	Steady state free precession

the perivascular region. A hypermetabolic soft tissue density extending from the subcutaneous tissue into the anterior abdominal wall muscles, was also seen. Otherwise, there was physiological uptake in the brain, liver, spleen, gastrointestinal, and genitourinary tracts.

A purulent fluid was drained from the anterior abdominal wall collection. While awaiting culture results, we took a biopsy from the abdominal collection wall, showing caseating granuloma (Fig. 5). Initially, all cultures and acid-fast bacilli (AFB) smears were negative, but three weeks later, mycobacterial culture grew a pansensitive mycobacterium tuberculosis (MTB), confirming the initially suspected diagnosis. MTB-polymerase chain reaction (PCR) from the collection was positive.

A multidisciplinary decision deferred cardiac biopsy or surgery to start first-line anti-TB treatment

Fig. 1. A 12-lead electrocardiogram shows sinus tachycardia with right axis deviation, nonspecific T-wave abnormalities in the inferior leads, and nonspecific QRS changes in the chest leads.

Fig. 2. Anterior posterior view of plain chest X-ray shows loculated (arrows) pleural effusion at the lower right heart boarder.

(ATT) (isoniazid, rifampicin, pyrazinamide and ethambutol), including steroids (prednisolone) to avoid possible paradoxical increase of the mass after initiation of ATT and anticoagulation to preclude

thrombus formation and possible thromboembolism. He was discharged on an enoxaparin subcutaneous injection, which was changed after three months to warfarin, due to compliance issues.

After five months, a repeated TTE and CMR showed regression of the mass to less than 10% of its original size (Fig. 4, Panels D–F). He continued treatment for a total of 12 months. A repeated CMR at four years showed a near-complete resolution of the mass (Fig. 6).

3. Discussion

Three histological types of myocardial involvement with TB have been described: diffuse infiltrative, miliary and nodular (tuberculoma) [1]. It was reported that tuberculomas favor certain heart chambers, with the right atrium being the most affected [1]. Infection spread is thought to occur through three mechanisms: retrograde lymphatic spread, hematogenous spread, and direct spread from a pericardial disease [1].

Cardiac TB can be silent or present with typical TB symptoms (fever, weight loss, etc.) if other organs are involved [5]. Nodular involvement is associated with infiltration of all myocardial layers, along with all types of symptoms and signs, ranging from arrhythmias to conduction blocks [5]. Hemodynamic instability, secondary to a single or multiple

Fig. 3. Continuous wave Doppler across the right atrium shows significant obstruction with a peak gradient of 6.8 mmHG.

Fig. 4. Panels A–C: Axial (A), 4-chamber (B), and sagittal (C) steady-state free precession (SSFP), CMR images at presentation shows a large right atrial mass; Panels D–F: Axial (D), 4-chamber (E), and sagittal (F) SSFP CMR images during follow-up after 5 months shows significant regression in mass size.

chamber obstruction, can also occur [5]. Aneurysm and pseudoaneurysm formation, dilated cardiomyopathies with heart failure, thromboembolism, and sudden cardiac death have also been reported [6].

Radiologically, echocardiography is the best initial modality [7]. CMR has the best high yield, however, due to a high-contrast resolution, an unrestricted field of view, and multiplanar imaging capability [7]. The ability to distinguish malignant or metastatic masses from benign masses by tissue differentiation and delayed enhancement effectively renders it the best imaging modality [7]. Biopsy from the mass or

cardiac tissue is unnecessary, as empiric treatment has been successful in many reports [7]. AFB smear and MTB PCR of the biopsied cardiac muscle are not reliable in most cases, although they are the confirmatory test of choice in diagnosing TB [1].

Treatment options primarily involve ATT alone [7]. The addition of steroids is based on the possibility of a paradoxical increase in size after starting the ATT, but this failed to yield consistent results [8]. Optimal duration of treatment has not yet been established in the literature, but similar periods of pulmonary TB, ranging from six months to nine

Fig. 5. Hematoxylin and eosin stain of abdominal wall tissue biopsy at 20x magnification shows non-necrotizing caseating granuloma within a background of fatty tissues, with a negative AFB smear from the tissue sample.

Fig. 6. Steady-state free precession (SSFP) CMR images after 4 years shows near-complete resolution of the right atrial mass.

months, have been reported with successful results in most cases, without the need for surgical intervention [9].

4. Learning objective

- Cardiac involvement of TB is an established diagnosis that is suspected in endemic areas.
- Rapid diagnosis and treatment initiation is critical to recovery and prognosis of patients, especially those presenting with life-threatening conditions.
- Advanced imaging of patients, such as CMR, primarily contributes to their proper diagnosis and follow-up.
- A multidisciplinary approach to intracardiac tuberculoma cases may be critical to expediting results for the correct diagnosis and promptly starting treatment.

Author contribution

Conception and design of Study: Moayad M. Alqurashi. Literature review: Moayad M. Alqurashi, Basel M. Alhaijani. Acquisition of data: Moayad M. Alqurashi, Ahmed Alsaileek. Analysis and interpretation of data: Moayad M. Alqurashi, Thamer H.

Alenazi, Ahmed Aljizeeri. Research investigation and analysis: Moayad M. Alqurashi, Ahmed Alsaileek, Ahmed Aljizeeri. Data collection: Moayad M. Alqurashi, Basel M. Alhaijani. Drafting of manuscript: Moayad M. Alqurashi, Thamer H. Alenazi. Revising and editing the manuscript critically for important intellectual contents: Ahmed Alsaileek, Thamer H. Alenazi, Basel M. Alhaijani, Ahmed Aljizeeri. Data preparation and presentation: Moayad M. Alqurashi, Ahmed Aljizeeri. Supervision of the research: Ahmed Aljizeeri. Research coordination and management: Moayad M. Alqurashi.

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Conflict of interest

None declared.

Ethical considerations

A written informed consent was taken from the patient to write and publish this article. All procedures conducted in this study involving human participants were performed in accordance with the ethical standards of the institutional and national research committees and with the Declaration of Helsinki and ICH-GCP standards.

References

- [1] du Toit-Prinsloo L, Saayman G. "Death at the wheel" due to tuberculosis of the myocardium: a case report. *Cardiovasc Pathol* 2016;25(4):271–4. <https://doi.org/10.1016/j.carpath.2016.03.003>.
- [2] Varghese B, Al-Hajoj S. Mapping the epidemiology and trends of extra-pulmonary tuberculosis in Saudi Arabia. *Int J Mycobacteriol* 2015;4(4):261–9. <https://doi.org/10.1016/j.ijmyco.2015.06.002>.
- [3] MOH. MOH STATISTICAL YEAR BOOK [Internet] - 2020. 2020.
- [4] WHO. World Health Organization. Global tuberculosis report 2020 [Internet]. Geneva, Switzerland: World Health Organization; 2020.
- [5] Säll O, Cha S-O, Holmberg H. Diagnostic challenges in a patient with myocardial tuberculoma: a case report. *Int J Surg Case Rep* 2016;29:201–3. <https://doi.org/10.1016/j.ijscr.2016.11.004>.
- [6] Mutyaba AK, Ntsekhe M. Tuberculosis and the heart. *Cardiol Clin* 2017;35(1):135–44. <https://doi.org/10.1016/j.ccl.2016.08.007>.
- [7] Mukharjee M, Bathia JN, Ghosh A, Singhi AK. A rare case of cardiac tumor in a child. *Ann Pediatr Cardiol* 2017;10(1):87–9. <https://doi.org/10.4103/0974-2069.197070>.
- [8] Banque MNF, Ribu RO, Policarpio MTT. Neonatal tuberculosis and cardiac inflammatory myofibroblastic tumor. *Asian Cardiovasc Thorac Ann* 2013;21(2):218–21. <https://doi.org/10.1177/0218492312451982>.
- [9] Maeder M, Ammann P, Rickli H, Schoch OD. Fever and night sweats in a 22-year-old man with a mediastinal mass involving the heart. *Chest* 2003;124(5):2006–9. <https://doi.org/10.1378/chest.124.5.2006>.