

Tuberculous Effusive-Constrictive Pericarditis

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Introduction: Tuberculosis (TB) is a serious disease in developing countries. Tuberculous pericarditis is a rare but life-threatening condition and may lead to cardiac tamponade and constrictive pericarditis.

Case Presentation: An 82-year-old man was referred for cardiac consultation. He was suffering from dyspnea, malaise, weight loss, night sweat, and fever for four months duration.

Discussion: Transthoracic echocardiography disclosed massive pericardial effusion, respiratory variation in mitral and tricuspid inflow E velocity, increased diastolic flow reversal with expiration in the hepatic vein, septum deviation in inspiration toward the left ventricle (LV), preserved LV function, and inferior vena caval (IVC) dilation without any collapse in inspiration. Chest computed tomography (CT) revealed a large amount of pericardial effusion and bilateral pleural effusion.

Keywords: Mycobacterium Tuberculosis; Pericarditis; Caseating Necrosis

1. Introduction

Cardiac involvement occurs in 1-2% of patients with pulmonary tuberculosis. In developing countries, tuberculosis (TB) is a serious problem. The diagnosis of tuberculosis is confirmed by the identification of mycobacterium tuberculosis (1). The most common form of cardiac involvement in TB is tuberculosis pericarditis (2). Human immunodeficiency virus infection, malnutrition, diabetes, marginalization, and poverty render humans prone to pulmonary and extra-pulmonary TB (EPTB) (3, 4).

2. Case Presentation

A 82-year-old man was referred for cardiac consultation because of urologic surgery. He was suffering from dyspnea, malaise, weight loss, night sweat, and fever for four months duration. He had been previously admitted to the coronary care for typical chest pain. Physical examination revealed hypotension, lower limb edema, abdominal ascites, jugular venous distension, muffled heart sounds, and diminished breath sounds. Transthoracic echocardiography (TTE) disclosed massive pericardial effusion (Figure 1), respiratory variation in mitral and tricuspid inflow E velocity, increased diastolic flow reversal with expiration in the hepatic vein, deviation of the septum in inspiration toward the left ventricle (LV), preserved LV function, and dilation of the inferior vena cava (IVC) without any collapse in inspiration (Figure 1). In tissue Doppler imaging (TDI), lateral mitral annular e'

velocity was lower than e' velocity from the medial annulus (annulus reversus) (Figure 2). Chest computed tomography (CT) showed large amounts of pericardial effusion and bilateral pleural effusion, with the right side more prominent than left side (Figure 3). Cardiac magnetic resonance imaging (CMR) displayed extensive pericardial thickening with large pericardial effusion (Figure 4). Real-time CMR showed an increased ventricular coupling with inspiratory septal inversion and increased right-sided septal motion at the onset of expiration.

Empirical tuberculosis therapy, consisting of isoniazid, rifampin, ethambutol, and pyrazinamide, was started. Three days after admission, the patient's condition deteriorated and immediately pericardiocentesis was carried out and dense and turbid fluid (about 100 cc) was drained. Both caseating necrosis and granuloma tissue were noted in the pathology of pericardial tissue study.

3. Discussion

An infectious disease carried through the air, TB can affect any organ and, in particular, the lungs. Lymph nodes are the most common site of EPTB. Other sites of EPTB are the genitourinary tract, pleura, bones, joints, meninges, central nervous system, peritoneum, and other abdominal organs. Mortality and morbidity are high in some types of EPTB such as tuberculosis meningitis (4).

Implications for health policy/practice/research/medical education:

This case emphasize on the possibility of cardiac involvement in tuberculosis. The most common form of cardiac involvement is tuberculous pericarditis. The occurrence of effusive-Constrictive Pericarditis in TB should be considered.

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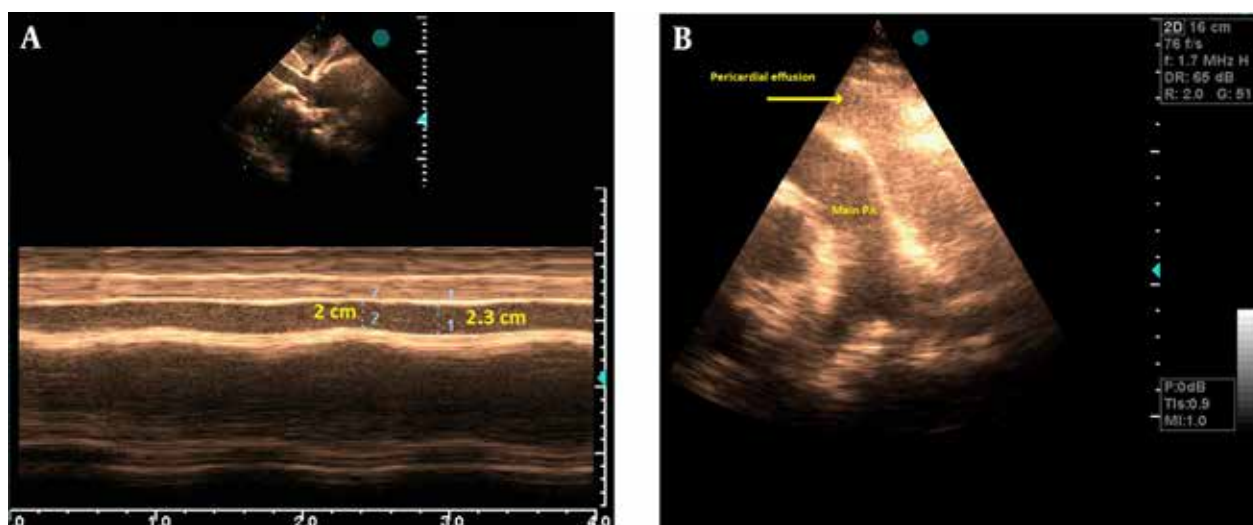
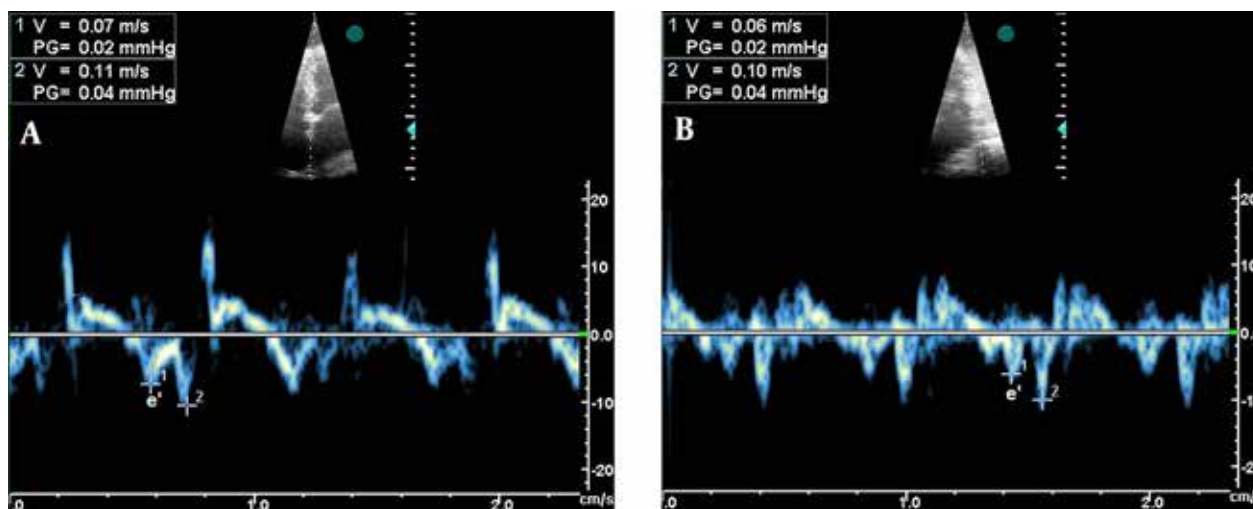


Figure 1. A) M-Mode Showing a Dilated IVC (Inspiratory Decrease in IVC Diameter is Characteristically < 50%), B) Two-Dimensional Parasternal Short Axis View of the Heart, Demonstrating Large Pericardial Effusion

Figure 2. A) Tissue Doppler Imaging of the Medial and B) Lateral Mitral Annulus



Lateral mitral annular e' velocity is smaller than e' velocity from the medial annulus (annulus reversus).

However, the diagnosis of EPTB can be made through biochemistry, cytology, and biopsy, but both sensitivity and specificity of Adenosine deaminase are high for the early diagnosis of EPTB (5). Infectious agents can cause pericarditis. Chronic pericarditis is classically caused by mycobacterium tuberculosis. The diagnosis of tuberculous pericarditis is confirmed by either the isolation of mycobacterium tuberculosis from the pericardial fluid and tissue or the identification of caseating granulomas in the pericardium (6).

The epidemiology of tuberculosis in developing countries differs significantly from that in developed countries. TB affects susceptible individuals such as aging adults (age \geq 65 years old) in epidemic countries.

About 75% of elderly patients, who have TB, tend to show pulmonary involvement. The reactivation of primary infection causes approximately 90% of TB cases in old patients. TB in old patients may present atypical symptoms such as changes in functional capacity, chronic fatigue, cognitive impairment, anorexia, and unexplained low-grade fever (7). The diagnosis of TB pericarditis can be made based on clinical presentation and laboratory analysis. The mean survival rate is 3.7 months, and the mortality rate is 85% at 6 months in patients without specific treatment. These facts and figures indicate the importance of accurate diagnosis and specific treatment of the TB pericarditis. The features of pericardial effusion and cardiac tamponade are similar



Figure 3. Pericardial Effusion (Thick Arrow) and Bilateral Pleural Effusion (Thin Arrow)



Figure 4. Extensive Pericardial Thickening With Large Pericardial Effusion

among TB and non-TB patients. The echocardiographic assessment of TB pericarditis is valuable for differentiating between effusion and sub-acute constriction. The presence of pericardial fibrinous strands and pericardi-

al thickening in echocardiographic assessment can introduce TB etiology. Chest CT is a noninvasive diagnostic test for TB pericarditis (8).

The major symptoms of TB pericarditis are cough, dyspnea, chest pain, night sweat, orthopnea, weight loss, and ankle edema. Pulsus paradoxicus, hepatomegaly, distended neck veins, and pleural effusion may be found on examination (9). EPTB should be managed in the same manner as pulmonary TB (10). Corticosteroid therapy, in the early stages of pericardial TB, reduces both fluid accumulation and likelihood of need for surgery (11).

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Authors' Contribution

Majid Kyavar and Nehzat Akiash: preparing the case and following up the patient.

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References

- Suchato C, Varatorn R, Pitiguagool V, Boonma P. Tuberculous Pericarditis. *Bangkok Med J.* 2011;**2**:30-3.
- Agarwal R, Malhotra P, Awasthi A, Kakkar N, Gupta D. Tuberculous dilated cardiomyopathy: an under-recognized entity? *BMC Infect Dis.* 2005;**5**:29.
- Salinas J, Calvillo S, Cayla J, Nedel FB, Martin M, Navarro A. Delays in the diagnosis of pulmonary tuberculosis in Coahuila, Mexico. *Int J Tuberc Lung Dis.* 2012;**16**(9):1193-8.
- Solovic I, Jonsson J, Korzeniewska-Kosela M, Chiotan DI, Pace-Asciak A, Slump E, et al. Challenges in diagnosing extrapulmonary tuberculosis in the European Union, 2011. *Euro Surveill.* 2013;**18**(12).
- Mathur PC, Tiwari KK, Trikha S, Tiwari D. Diagnostic value of Adenosine Deaminase (ADA) Activity in Tubercular Serositis. *Indian J Tuberc.* 2006;**53**(2):92-5.
- Fallah F, Eslami G, Goudarzi H, Eslami M, Taheri S, Nobahar R, et al. Frequency of tuberculous pericarditis in patients with the diagnosis of pericarditis. *Iran J Clin Infect Dis.* 2006;**1**(4):195-7.
- Rajagopalan S. Tuberculosis and aging: a global health problem. *Clin Infect Dis.* 2001;**33**(7):1034-9.
- Reuter H, Burgess L, van Vuuren W, Doubell A. Diagnosing tuberculous pericarditis. *QJM.* 2006;**99**(12):827-39.
- Trautner BW, Darouiche RO. Tuberculous pericarditis: optimal diagnosis and management. *Clin Infect Dis.* 2001;**33**(7):954-61.
- Golden MP, Vikram HR. Extrapulmonary tuberculosis: an overview. *Am Fam Physician.* 2005;**72**(9):1761-8.
- Chhabra N, Aseri ML. Adjunctive corticosteroid therapy in tuberculosis management: a critical reappraisal. *Int J Pharm Stud Res.* 2011;**2**(1):10-5.