

## **Case Report**

### **An unusual case of cardiac tamponade in a 10 year old girl**

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**Abstract:** Pericardial effusion complicated by cardiac tamponade is a medical emergency. Reason may be trauma, infection, malignancy, endocrinal or radiation. Irrespective of the cause, immediate pericardiocentesis is indicated to prevent cardiogenic shock. We present an unusual case of cardiac tamponade in a 10 year old girl which is very rare to the best of our knowledge.

**Keywords:** Pericardial effusion, cardiac tamponade

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#### **INTRODUCTION**

Pericardial effusion complicated by cardiac tamponade is a medical emergency[1]. The underlying reason may be trauma, infection, malignancy, endocrinal or radiation[2]. Irrespective of the cause, immediate pericardiocentesis is indicated to prevent cardiogenic shock. We present this baffling case of an apparently healthy child who presented with cardiac tamponade.

#### **CASE REPORT**

A 10 year old girl was admitted with fever for 4 days followed by sudden onset cough and respiratory distress. There was history of minor trauma in the foot while playing. On examination, she was febrile, nodding her head with respiration and preferred to be in recumbent posture. There was profuse sweating, cyanosis, tachycardia, severe chest indrawing, engorged non-pulsatile neck veins, hepatomegaly, feeble apical impulse and low intensity heart sounds on auscultation. ECG in all 12 leads was of low amplitude. (Fig.1) Chest X ray showed enlarged cardiac shadow with right sided moderate pleural effusion and consolidation. (Fig.2) Echocardiogram measurement was 2.8 X 2.2 cm huge pericardial effusion with 17% left ventricular ejection fraction. Spo<sub>2</sub> was 88%. The girl was diagnosed as to be in cardiac tamponade and immediate arrangement was done for pericardiocentesis.

Three fifty ml of pericardial fluid was drained by pigtail catheter through subxiphoidal route. It was straw coloured. Child was relieved but was still on supplemental oxygen. Keeping in mind, the acute onset of illness and history of trauma, Staphylococcus aureus infection was the first consideration. Possibilities of Streptococcus, viral causes and atypical organisms viz. Chlamydia and Mycoplasma were also kept in mind.

Injection Vancomycin and Ceftriaxone were started while awaiting pericardial fluid culture report. Complete hemogram showed Hb – 8.9 gm%, WBC count- 11,440/cmm, DC-N46L50M2E2B0. All other systems were normal.

The pericardial fluid did not show any aerobic or anaerobic growth. But cell count was 480/ cmm with 65% lymphocytes, 30% neutrophils, 5% mesothelial cells. Protein was 8.2gm/dL and sugar was 43mg/dL. After 30 hours, the child deteriorated with recurrence of respiratory distress and feeble pulse. Repeat chest x ray showed again there was pericardial collections. This time, two hundred fifty ml of reddish brown hemorrhagic pericardial fluid was drained.

Now, a strong suspicion of TB was made and Antitubercular drugs (ATD) were started promptly after pericardiocentesis as per guidelines with 4 drugs (Isoniazide, Rifampicin, Pyrazinamide, Etambutol) for two months followed by 2 drugs (Isoniazide, Rifampicin) for next 4 months. Pericardial fluid report showed Protein 8.5gm/dL, 550 cells, with 60% lymphocytes, 30% neutrophils and plenty of RBCs. Adenosine deaminase for Mycobacterium tuberculosis was 78 U/L which was strongly positive. Mantoux test and HIV serology were negative.

Child was afebrile from next 48 hours. There was gradual improvement of general conditions including appetite. Repeat echocardiogram after 1 week showed minimal effusion with normalisation of left ventricular ejection fraction. She was discharged with counselling of parents to continue ATD. Follow up after one month showed normal chest x ray and catch up growth curves.( Fig.3)



**Fig-1: Low voltage ECG in pericardial effusion**



**Fig-2: Chest X ray showing huge pericardial effusion with right sided moderate pleural effusion and consolidation**



**Fig-3: Normal Chest X ray after 1 month of antitubercular treatment**

## DISCUSSION

Hemorrhagic pericardial effusion is caused by trauma, vascular tumours, tuberculosis, hemorrhagic diathesis, vasculitis, uremia, dissecting aortic aneurysm[3]. It can be rarely caused by *Chlamydomydia pneumoniae*[4]. Most of the cases are complicated by cardiac tamponade.

The index case also presented with cardiac tamponade and underwent pericardiocentesis twice within 48 hours. This indicates the severity of the disease. None of the pericardial fluid culture showed any growth. Tuberculosis was suspected the next time when there was bloody tap.

Tuberculosis is detected in 1-2% of all acute pericarditis cases in developing countries. Seven percent of these cases present with cardiac tamponade. TB is an important cause of hemorrhagic pericardial effusion in endemic zones. Mortality ranges from 14-40% [5,6]. Tubercular pericarditis has four phases of development like dry phase, effusion phase, absorptive phase and constrictive phase[7]. Pericardial fibrins formed in effusion phase later results into pericardial thickening and causes constrictive pericarditis[8].

Definitive diagnosis of Tuberculous pericarditis is done by: (i) identification of *Mycobacterium tuberculosis* from the pericardial tissue or fluid cultures, (ii) histopathologic demonstration of granulomas or acid-fast bacilli in the pericardial tissue, (iii) formation of granulomas in pericardial tissues in the presence of known extracardiac tuberculosis and (iv) response to specific antituberculosis therapy[7,9]. In our case, other than response to ATD, none of diagnostic criteria was there. *Mycobacterium tuberculosis* is quite difficult to be isolated in pericardial fluid and is present only in one third cases. The biochemical parameter diagnostic of TB in our case was high level of adenosine deaminase in pericardial fluid. Studies have reported that ADA value 63-117 U/L has a sensitivity and specificity of 100% and 83.3% respectively in diagnosing tubercular pericardial effusion[10]. Other studies have found similar accuracy even at 40 U/L [11]. The index case had ADA value of 78 U/L. Hemorrhagic pericardial effusion caused by tuberculosis has been reported in immunocompromised adults and geriatric patients[12-15] but is quite rare in immunocompetent children.

Our index case was an immunocompetent 10 year old girl presenting with tubercular hemorrhagic pericardial effusion and tamponade with raised ADA as the only biochemical marker of TB. We present this case due to its rarity and to emphasize the diagnostic role of ADA in any tubercular serositis.

## REFERENCES

1. Chatterjee K, McGlothlin D, Michaels A; Analytic reviews: cardiogenic shock with preserved systolic

- function: a reminder. J Intensive Care Med, 2008; 23(6): 355-66.
2. Palacios IF. Pericardial Effusion and Tamponade. Curr Treat Options Cardiovasc Med.1999 Jun;1(1):79-89.
3. Spodick DH; Acquired pericardial disease: pathogenesis and overview. In: The pericardium: a comprehensive textbook, New York, NY: Marcel Dekker, 1997; 83.
4. Tenenbaum T, Heusch A, Henrich B, MacKenzie R, Schmidt KG, Schroten H; Acute Hemorrhagic Pericarditis in a Child with Pneumonia Due to *Chlamydomydia pneumoniae*. J Clin Microbiol, 2005; 43(1): 520-522.
5. Mastroianni A, Coronado O, Chiodo F; Tuberculous pericarditis and AIDS: case reports and review. Eur J Epidemiol, 1997;13:755-9.
6. Fowler NO; Tuberculous pericarditis. JAMA, 1991;266: 99-103.
7. Trautner BW, Darouiche RO; Tuberculous pericarditis: optimal diagnosis and management. Clin Infect Dis, 2001; 33:954-61.
8. Yang CC, Lee MH, Liu JW, Leu HS; Diagnosis of tuberculous pericarditis and treatment without corticosteroids at a tertiary teaching hospital in Taiwan: a 14-year experience. J Microbiol Immunol Infect, 2005;38:47-52.
9. Cherian G; Diagnosis of tuberculous aetiology in pericardial effusions. Postgrad Med J, 2004;80:262-6.
10. Mathur PC, Tiwari KK, Trikha S, Tiwari D; Diagnostic value of adenosine deaminase (ADA) activity in tubercular serositis. Indian J Tuberc, 2006; 53:92-95.
11. Koh KK, Kim EJ, Cho CH, Choi MJ, Cho SK, Kim SS, et al; Adenosine deaminase and carcinoembryonic antigen in pericardial effusion diagnosis, especially in suspected tuberculous pericarditis. Circulation, 1994; 89(6):2728-2735.
12. Atar S, Chiu J, Forrester JS, Siegel RJ; Bloody Pericardial Effusion in Patients With Cardiac Tamponade: Is the Cause Cancerous, Tuberculous, or Iatrogenic in the 1990s? Chest. 1999;116(6):1564-1569.
13. Trautner BW, Darouiche RO; Tuberculous Pericarditis: Optimal Diagnosis and Management. Clinical Infectious Diseases, 2001; 33:954-61.
14. Yıldız A, Gür M, Yılmaz R, Demirbağ R, Çelik H, Aslan M, Koçyiğit A; Lymphocyte DNA damage and total antioxidant status in patients with white-coat hypertension and sustained hypertension. Arch Turk Soc Cardiol, 2008; 36:231-8.
15. Kudoh Y, Kijima T, Sugita J, Moriyama H, Iimura O; Tuberculosis on regular hemodialysis-a case of pericardial tamponade. Jpn Circ J, 1989;53(5):416-9.