



Case Report

A CASE OF HASHIMOTO'S THYROIDITIS INDUCED MASSIVE PERICARDIAL EFFUSION
MASQUERADING AS TRAUMATIC PERICARDIAL EFFUSION: A RARE CASE REPORT

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ABSTRACT

Objective: A polytrauma patient with chest injury having incidentally detected asymptomatic pericardial effusion secondary to Hashimoto's thyroiditis, masquerading as traumatic massive pericardial effusion with impending cardiac tamponade.

Methods: We present the clinical features, biochemical and laboratory findings with Echocardiographic imaging data of the pericardial effusion for the current patient and review the clinical presentation, prevalence, pathophysiology, diagnosis, and treatment of pericardial effusion with impending tamponade.

Results: A 25 year-old man, not a known case of any co morbidity presented with polytrauma after an accident on construction site, with history of chest trauma. Patient was having severe sinus bradycardia for which echocardiography was advised. 2D echocardiography demonstrated a massive pericardial effusion and diastolic right atrial collapse suggestive of impending tamponade. An emergent pericardial window procedure via subxiphoid route was performed, and 1000ml of fluid was removed. The Non hemorrhagic fluid was sent for biochemical analysis which revealed exudative nature of the fluid. On evaluating the causes of Massive pericardial effusion, patient was found to have severe hypothyroidism with positive anti TPO antibodies. Levothyroxine therapy was initiated. Patient was stable and discharged with satisfactory condition.

Conclusion: From our review of the literature, we conclude that impending cardiac tamponade is a rare initial manifestation of autoimmune hypothyroidism. A high index of suspicion must be maintained for timely diagnosis of pericardial tamponade followed by prompt intervention. Recurrent pericardial effusions are common, necessitating close follow-up. Treatment of the hypothyroidism with levothyroxine is imperative.

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INTRODUCTION

Pericardial effusion has multifactorial etiologies like tuberculosis, acute pericarditis, malignancies, uremia, hypothyroidism, trauma, cardiac surgery, or other inflammatory/non-inflammatory conditions. Hypothyroidism can virtually affect any organ system, including the digestive, cardiovascular, dermatological, endocrine, hematological, musculoskeletal, psychiatric renal and pulmonary systems. When it comes to the cardiovascular system, abnormal thyroid function can lead to abnormalities in heart contractility, heart rate, cardiac conduction system, ventricular function, systemic vascular resistance and the endothelial lining therefore predisposing to arrhythmias, heart failure, high blood pressure and pericardial disease [1]. Pericardial effusion due to hypothyroidism was reported as early as 1918 [2]. The total incidence of pericardial effusion secondary to hypothyroidism varies in different studies from 30% to 80% [3]. Moderate to large pericardial effusion are rarely found and cardiac tamponade is extremely uncommon [4]. Pericardial effusion secondary to hypothyroidism pose a serious diagnostic challenge among clinicians due to the

general disagreement between the volume of effusion and clinical symptomatology [5]. This low incidence is most likely due to gradual accumulation of transudative fluid and gradual pericardial distention [6]. One striking feature that aids in differentiating cardiac tamponade caused by hypothyroidism from the other causes of tamponade is the absence of sinus tachycardia in hypothyroidism [7]. Another diagnostic marker of hypothyroidism induced pericardial effusion is that it has high concentration of protein but its pathogenesis is not fully understood [8]. Echocardiography is the gold standard diagnostic test with a very high sensitivity and specificity in the diagnosis of pericardial effusion [9]. Hypothyroidism causes increased permeability of the pericardial capillaries to albumin. This in addition to decreased drainage of albumin into the lymphatic system, leads to increased colloid pressure within the pericardium and hence, decreased colloid osmotic pressure gradient between the pericardial space and pericardium [10].

Here we report an unusual case that got admitted as a polytrauma case with blunt chest injury with multiple vertebral and toes' fractures. On examination the patient was

hemodynamically stable having normal JVP, no pulsus paradoxus and no muffling of heart sounds were observed. ECG was not showing electrical alterans but was found to have severe sinus bradycardia and low voltage complexes for which echocardiography was advised. On echocardiography he was found to have massive pericardial effusion with impending tamponade which was thought to be traumatic in nature in view of his chest injury but on emergent pericardiocentesis and chemical analysis of the pericardial fluid turned out to be massive non purulent exudative pericardial effusion secondary to autoimmune Hashimoto's thyroiditis. Patient was kept on levothyroxine therapy and discharged after ruling out recurrent pericardial effusions.

CASE HISTORY

A 24-year-old male farm labourer by profession came to Dhiraj General Hospital emergency ward with alleged history of - breakage and fall of brick wall on his back from height and injury over back and left foot and scalp and patient was complaining of chest pain and pain over back and left foot. In general patient appeared to be case of polytrauma. On general examination patient was conscious alert and oriented and had a abrasion over forehead and a sutured wound over scalp. Patient was referred to us from a peripheral small private nursing home in order to manage the findings of ECG and computerized tomography chest which was of pericardial effusion and bradycardia. On vital examination Heart rate was around 32 per minute and was regular and blood pressure of 110/70 mm of Hg and SpO₂ of 100% on room air.

Patient was admitted in cardiac surgery department. On ECG patient was having sinus bradycardia. On 2D-Echocardiography there was massive pericardial effusion with evidence of early cardiac tamponade and mild concentric Left ventricular hypertrophy and left ventricular ejection fraction of 60%. After admission needle pericardiocentesis was done with 18 gauge needle by guidance under fluoroscopy and with echocardiography 460 ml fluid was aspirated. Fluid sent for pathological, microbiological and biochemical examinations. On Xray spine Anteroposterior and lateral view it showed L3 and L4 vertebrae transverse process fracture and L4 vertebra spinous process fracture conservative management was done. On left foot Xray it showed 5th metatarsal distal head fracture aka Jones fracture for which cast immobilization was done. Patients all routine bloodwork was normal except Serum TSH which was exceptionally high as >100microIU/ml (Norma Range= 0.4-11microIU/ml). On complete thyroid profile tests free serum T3 came as 0.3nanogm/ml (Normal range=0.79-1.58ng/ml), free serum T4 came as 1.12microgm/ml(Normal Range=4-11 microgm/ml) and Anti-TPO(Thyroid Peroxidase) antibodies was 792 IU/ml (Normal Range=0-35 IU.ml). So, diagnosis of Primary Autoimmune Hypothyroidism (=Hashimoto Thyroiditis) was made.

On Review examination there was diffuse multinodular enlarged left lobe of thyroid more towards superior pole.

On lab workup of pericardial fluid was of neutral pH, no cob webbing, no clots, sugars-69mg/dl, total proteins-4.4/dl, albumin-3.7/dl, ADA-9IU/ml, LDH-518 IU/ml, On microscopy total count was 1000cell/ml Differentiated WBC count was as lymphocytes-25%, polymorphs-15%, mesothelial cells-60%. And serum total proteins-7.7/dl, albumin 4.5/dl, globulin-3.2/dl, LDH- 773IU/ml. So, ratio of fluid: serum

	Pericardial Fluid	Serum	Ratio	Interpretation
Total Proteins	4.4	7.7	0.555	Exudative
Albumin	3.7	4.5	0.822	Exudative
LDH	518	773	0.726	Exudative

Post procedure patient was monitored in ICU for 3 days and was started with Levothyroxine 100 microgram OD. Patient was having uneventful recovery and discharged in satisfactory condition with advice of regular follow-up.

DISCUSSION

Thyroid disorders are more prevalent in India compare to rest of the world and elderly women are affected most. Bradycardia, diastolic hypertension, a narrowed pulse pressure, and attenuated activity on the precordial examination are some most frequent cardiac findings of hypothyroidism. nonspecific findings are high serum concentrations of cholesterol and creatine kinase [11]. Severe and long-standing disease can present as pericardial effusion, myxedema, slowness of cardiac nerve impulse results in prolongation in the QT interval [12]. T3 i.e., Triiodothyronine increase Renin angiotensinogen aldosterone system (RAAS) activity results in increase blood volume and increase systemic vascular resistance, increased cardiac inotropy and flow. So, hyperthyroidism causes systolic hypertension and hypothyroidism causes diastolic hypertension due to change in Systemic vascular resistance and RAAS activity [13]. Thyroid hormone also causes activation of B1-adrenergic receptors which results in increased cardiac contractions. Sarcoendoplasmic reticulum pump i.e., responsible for increased calcium uptake and relaxation of heart is modulated by Phospholamban protein. This phospholamban protein is inactivated by thyroid hormone. So causes increased cardiac contractions [14]. Hardisty *et.al.* demonstrated association of pericardial effusion with hypothyroidism in up to 30% cases. [15] There have been many case reports regarding hypothyroidism as cause of pericardial effusion but we are reporting a case of massive pericardial effusion with hypothyroidism with unique presentation. This patient is overtly hypothyroid and clinically asymptomatic except has bradycardia on examination and presented with polytrauma and massive pericardial effusion masquerading hemopericardium secondary to blunt trauma of chest.

Mechanism of Effusions in Hypothyroidism

Serous cavity effusion is seen less frequently in hypothyroidism.

Following mechanism are described:

1. leakage of albumin due to increase capillary permeability and lack in compensatory lymphatic flow secondary to low T3 level.
2. extravasated albumin combine with hyaluronic acid and forms complex so decreases in lymphatic drainage.
3. decrease in nitric oxide level leads to increase capillary permeability and increased plasma protein filtration with endothelial dysfunction [16].

Effusions occurring because of hypothyroidism are mainly exudative as in our case effusion it is also exudative.

Echocardiographic findings of heart in hypothyroidism are reversible It is well known in various studies it consist of Heart dilatation, reduced myocardial contractility, enlarged thickness

of the interventricular septum and posterior wall of the left ventricle with deviation in the mitral valvular movement, retarded rate parameters of movements of the valvular structures and increases in the left ventricular volume[17]. Echocardiographically the hypothyroid heart may have different types of presenting features and spectrum may lie between hypertrophic and dilated cardiomyopathy and reversible upon normalization of thyroid functions [18]. Gradual thyroxine therapy may reverse the concentric Left ventricular thickening which has been well documented in the literature [19]. Here in our case report the patient of polytrauma, diagnosed incidentally with pericardial effusion during routine investigation cause noncardiac was expected secondary to blunt trauma to the chest, found associated with some other reason. Surprisingly pericardial fluid which was drained found to be serous in nature instead of hemorrhagic as suggested in previous CT chest report. Pericardial fluid came to be exudative in nature and after further investigation it was found to be associated with hypothyroidism.

CONCLUSION

Hypothyroidism presenting as massive pericardial effusion is rare but easy to treat. Because of insidious onset, gradual progression and non-specificity of signs and symptoms of hypothyroidism along with rare occurrence of moderate to massive pericardial effusion in these patients, hypothyroidism induced pericardial diseases are under diagnosed. Treatment with thyroid hormone replacement therapy leads to complete regression of the pericardial effusion. On routine evaluation of massive pericardial effusion after excluding common causes such as trauma, tuberculosis, malignancies and infections and connective tissue disorders, thyroid function tests should be performed even if there are no other signs and symptoms suggestive of hypothyroidism.

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