

Subacute Cardiac Tamponade In A Patient With Myxedematous Pericardial Effusion

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Citation

T Mukhithi, R Cordoves, J Zaldivar. *Subacute Cardiac Tamponade In A Patient With Myxedematous Pericardial Effusion*. The Internet Journal of Cardiology. 2020 Volume 15 Number 1.

DOI: [10.5580/IJC.55470](https://doi.org/10.5580/IJC.55470)

Abstract

Hypothyroidism is a recognized cause of pericardial effusion but as a cause of cardiac tamponade it is rare, especially in the sub-Saharan Africa where tuberculosis is the commonest cause. When clinically suspected, confirmation of cardiac tamponade with echocardiography is mandatory; technic that will assist in the execution of an ultrasound-guided, lifesaving, pericardiocentesis. We report a case of a patient who presented with cardiac tamponade secondary to myxedema and Wolf-Parkinson-White pattern as incidental finding.

INTRODUCTION:

There are multiple causes of pericardial effusion (PE): infections, neoplasms, autoimmune diseases, trauma, uremia, myxedema, iatrogenic and others; any of them might cause a cardiac tamponade (CT).^[1] In developed countries idiopathic (presumably viral), neoplastic and iatrogenic are the leading causes of PE but in developing countries, especially sub-Saharan Africa, tuberculous pericarditis is by far the commonest, situation that has worsened with the HIV epidemic, however others unexpected causes surprise us sometimes.^[2] 3]

The pericardial sac can stretch to accommodate large volumes of fluid, up to four liters or more, if it develops slowly. At any given moment the pericardium behaves as a rigid container; in such a way that a sudden increment of pericardial volume will elevate the intrapericardial pressure opposing cardiac chambers pressure and impeding compliance during diastole; when pericardial and myocardial pressures equalize CT develops.^[2]

Acute CT develops within minutes due to rupture of the heart or aorta, trauma or as a complication of an invasive procedure; its presentation resembles a cardiogenic shock. Subacute CT develops over days to weeks and can be associated with PE of any aetiology. Patients present with the classical picture of CT: shortness of breath, chest discomfort, peripheral edema, hypotension, engorged jugular veins, pulsus paradoxus, etc.^[3]

The diagnosis of CT demands a high index of suspicion, regardless of its aetiology, because it resembles severe right side cardiac failure or shock. An immediate decompression of the heart is mandatory in order to avoid the imminent patient death.

PE in hypothyroidism is commonly recognized but as a cause of CT it is rare, presumably because fluid slow accumulation allows the pericardial sac to accommodate large quantities of it.^[4]

Echocardiography revolutionized the diagnosis of CT.^[5] After suspecting this complication from the medical history and physical findings, mainly the presence of pulsus paradoxus, the visualization of diastolic collapse of right cardiac chambers makes this diagnosis certain demanding the immediate execution of a lifesaving pericardiocentesis or pericardial window.

We report a patient with primary hypothyroidism who presented in cardiac tamponade and who had a WPW pattern type B as incidental finding.

CASE REPORT

A 56-year-old female patient was brought by her relatives to the emergency department because of one month history of weakness and prostration. She gave a vague history of poor appetite and constipation for "a long time". She complained of feeling weak and easy fatigue when walking for about a month; her weakness became worse since a week prior to

Figure 2

Echo showing pericardial effusion with partial diastolic collapse of right atrium and ventricle.



Figure 3

Echo showing persistence of small pericardial effusion.

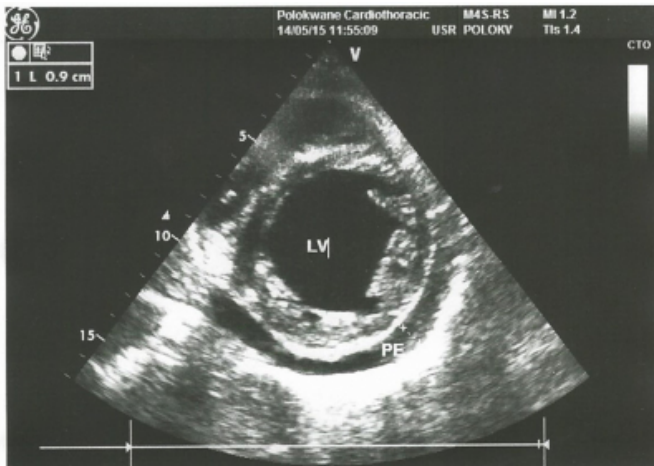


Table 1

Lipids and thyroid function.

Test	Result	Normal value
Total Cholesterol	3.99 mmol/L	< 5.2 mmol/L
LDL cholesterol	1.64 mmol/L	<3 mmol/L
HDL cholesterol	1.67 mmol/L	>1.2 mmol/L
Triglyceride	1.49 mmol/L	<1.7 mmol/L
TSH	> 100 mU/L	0.5-4.5 mU/L
T4	1.2 pmol/L	12-22 pmol/L
T3	1.3 pmol/L	3.9-6.7 pmol/L

DISCUSSION:

The patient that we present is interesting for two reasons, first because myxedematous PE is a rare cause of CT and second due to the coexistence of a WPW pattern.

In developed countries the leading causes of PE, and therefore tamponade, are acute pericarditis (presumably viral), trauma, and rupture of the heart.^[1] Corey et al reported, out of 57 patients, that malignancy (23%), viral infection (14%), and radiation-induced inflammation (14%) were the most common causes of medical PE; no effusion caused by hypothyroidism was identified.^[2] Regarding CT, Cornily and coworkers found 114 patients, in a 10 years period, of whom 74 (65%), 11 (10%) and 4 (3%) represented cases of malignant PE, viral pericarditis and hemopericardium due to anticoagulants respectively; again, no case of myxedematous PE was reported.^[3] The reports of these different aetiologies will depend on the characteristics of the population investigated, the different types of departments (general versus specialized), the study protocol employed and the prevalence of the different aetiologies in a given geographic area.^[4]

In Sub Saharan Africa cardiac tamponade is most frequently caused by tuberculous pericarditis; in fact when facing a patient with this complication, if there is no evidence of trauma or malignancy, this should be the most likely diagnosis, regardless of the evidence of tuberculous infection, pulmonary or otherwise.^[5] In our case this aetiology was ruled out by a negative genXpert test, relevant microscopy and culture for tuberculosis, even the ADA level did not suggest this cause.

Pericardial effusion in hypothyroidism has been reported

from 30 to 64% from early reports to just 3 to 6% in more recent studies.^[11,12] The occurrence of pericardial effusion in hypothyroidism appears to be dependent on the severity of the disease; a reduction of the diagnosis of mixedematous PE is attributed to an earlier diagnosis of hypothyroidism due to wider availability of laboratory facilities and modern techniques of hormones measurements.^[3] PE can take months to disappear despite clinical and humoral evidence of euthyroidism. The case that we present showed a typical clinical and humoral picture of advanced myxedema. Eight months after the initial event and normal thyroid function test values small pericardial effusion was still present, (Figure 3).

The diagnosis of CT is both difficult and urgent; a high index of suspicion is needed. This syndrome is characterized by the following triad: arterial hypotension, venous hypertension (distended neck veins), “quiet heart” (distant or inaudible heart sounds), also known as Beck’s triad, and pulsus paradoxus. Most patients show tachycardia; its absence might indicate hypothyroidism or uremia, the former was the explanation for a normal heart rate in our patient.^[4] Pulsus paradoxus has been defined as a fall in inspiratory systolic blood pressure of 10 mm of Hg or more during normal breathing, it can be measured by intra-arterial catheterization or by manual sphygmomanometer, being the former more accurate but usually not available in the emergency room. Manual sphygmomanometers has virtually disappeared from South African hospitals, electronic monitors have replaced them, they are more accurate, if well calibrated, but useless for detecting postural hypotension or pulsus paradoxus; that is why we had to use the inspiratory disappearance of the radial pulse as a sign of pulsus paradoxus, the same criterion used by Kussmaul almost 150 years ago, a physical sign still valid but much less sensitive.

An enlarged cardiac silhouette on chest x-ray is common in CT, as it was the case in our patient; however, its absence does not rule out the condition, specifically in acute CT, since more than 200 mL of fluid are needed for the cardiac silhouette to enlarge. ^[4]

The typical electrocardiographic findings of CT are low voltage and electrical alternance, features that our patient electrocardiogram did not show, although neither of them is very sensitive. ^[4] It also showed a remarkable finding, a WPW pattern, type B in this case. We classified it pattern, rather than syndrome, because there was no history of palpitations or documented arrhythmias. We consider this

electrocardiographic abnormality just an incidental finding.

WPW type B resembles LBBB, rarely these two conditions can coexist. ^[4] Short PR interval, delta waves and normal PJ interval (< 0,270 ms) favor the former whereas the morphology of R wave in lead DI, slurred almost round, made us to consider the coexistence of the later.

Hypothyroidism has been associated to higher risk of atherosclerosis, presumably due to dyslipidemia, that our patient did not have, but also caused by diastolic hypertension and endothelial dysfunction. ^[13] LBBB could be expression of coronary heart disease, silent due to decreased physical activity and low oxygen demand. The patient sudden death could also suggest an acute episode of myocardial ischaemia. Unfortunately, we couldn’t perform electrophysiological studies to gather evidence in favor of our hypothesis, mainly, that this was a case of WPW pattern and LBBB rather than just WPW type B alone. Facilities to perform electrophysiological studies were not available in our hospital and the patient rejected the idea of going to another institution alleging that she was feeling well after treatment.

Ultrasonic visualization of the heart has revolutionized the approach to CT. ^[14] This technique enables us to objectively observe the pericardial fluid and the collapsing of the right ventricle and, or, right atrium. It also provides guidance when performing the pericardiocentesis. A formal echocardiogram, although desirable, is not mandatory; an informal study performed by anyone with just basic knowledge of the technique can provide a quick change in patient outcome. In most developing countries a cardiologist may not be available in the right place at the right time, but the removal of just 200-300 ml of pericardial fluid under echocardiogram guidance can save many lives. Several lessons can be learned from this case:

1. Myxedematous pericardial effusion is an uncommon cause of cardiac tamponade but this aetiology should be considered if the clinical picture suggests hypothyroidism and other commoner causes are excluded.
2. There is still a place for manual sphygmomanometer in modern medical practice otherwise pulsus paradoxus and postural hypotension will never be detected.
3. An informal echocardiogram could be a lifesaving diagnostic tool in the emergency room and the technique should be learned by any practitioner not only cardiologists.
4. Although we could not prove it with this patient, it is important to remember that WPW pattern, or syndrome, and bundle branch blocks can coexist in the same patient.

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