Case Report

"The dancing pump:" Hypothyroidism with cardiac tamponade – A case report

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ABSTRACT

Hypothyroidism is a common endocrine disorder seen in middle-aged women. Mild pericardial effusion might be seen in patients with unmanaged hypothyroidism but rarely presents with cardiac tamponade and rarely referenced in the literature. Here, we report an unusual case of a 45-year-old female, who presented with breathlessness and was found to have a large pericardial effusion with cardiac tamponade, secondary to hypothyroidism. Treatment included an emergency pericardiocentesis followed by thyroxine hormone replacement.

Key words: Cardiac tamponade, Hypothyroidism, Pericardial effusion, Pericardiocentesis, Thyroxine

Pericardial effusion in overt hypothyroidism is common (incidence 3–6%), but cardiac tamponade and pre-tamponade as a presentation in newly diagnosed hypothyroidism are rare [1,2]. Pericardial effusion may be caused by acute pericarditis, tumor, uremia, hypothyroidism, trauma, cardiac surgery, or other inflammatory/non-inflammatory conditions [2]. The occurrence of pericardial effusion in hypothyroidism appears to be dependent on the severity of the disease. The distinguishing feature of pericardial effusion caused by hypothyroidism is the absence of sinus tachycardia, which is more common in pericardial effusion due to other causes [3].

Pericardiocentesis is usually unnecessary unless significant cardiac tamponade has developed [4,5]. Echocardiography is the gold standard diagnostic test with very high sensitivity and specificity in the diagnosis of pericardial effusion [6]. Here, we report an uncommon case of cardiac tamponade due to hypothyroidism. Hypothyroidism usually does not present with cardiac tamponade or pre-tamponade primarily, hence making this a rare presentation.

CASE REPORT

A 45-year-old female presented with complaints of abdominal distension and chest discomfort for 6 months, breathing difficulty for 1 month, recent onset of swelling of the feet, and change of voice. The patient was diagnosed with hypothyroidism 5 years ago and was non-compliant to medication.

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On arrival, vital signs were as follows: Heart rate: 68/min, blood pressure: 110/70 mm Hg, respiratory rate: 24/min, and SpO_2 was 90% on room air, and 100% on oxygen. General physical examination revealed pallor and bilateral pitting pedal edema. On systemic examination, there were muffled heart sounds, distended neck veins, basal crepitation bilaterally on auscultation of the chest, and shifting dullness on the abdominal examination suggestive of ascites. A provisional diagnosis of cardiomyopathy and/or anemia in failure was made.

Bedside blood investigations revealed respiratory alkalosis with hypoxia on the arterial blood gas and anemia on the complete blood count. Electrocardiography (ECG) showed low voltage complexes, as shown in Fig. 1. Chest X-ray showed massive cardiomegaly, as shown in Fig. 2. Focused cardiac ultrasound was done which showed massive pericardial effusion with the right atrial and ventricular collapse suggestive of cardiac tamponade and normal left ventricular function, as shown in Fig. 3.

Under echocardiographic guidance, about 700 ml of pericardial fluid was aspirated through the apical approach. The fluid analysis showed proteins: 5.6 g/dL; sugar: 98 mg/dL; acid-fast bacilli: Negative; and culture negative for organisms; microscopy showed few mesothelial cells, cystic macrophages and occasional lymphocytes, and degenerated cells. This analysis suggested an exudative effusion with no evidence of infective or neoplastic pathology. Thyroid profile values were serum T3: 0.6 pg/mL (n: 1.5–3.0 pg/ml); T4: 2.15 µg/dL (n: 4–6 µg/dL); and thyroid-stimulating hormone: 68.20 mIU/mL (n: 3–5.5 mIU/mL).

A final diagnosis of cardiac tamponade secondary to hypothyroidism was made and the patient was taken for

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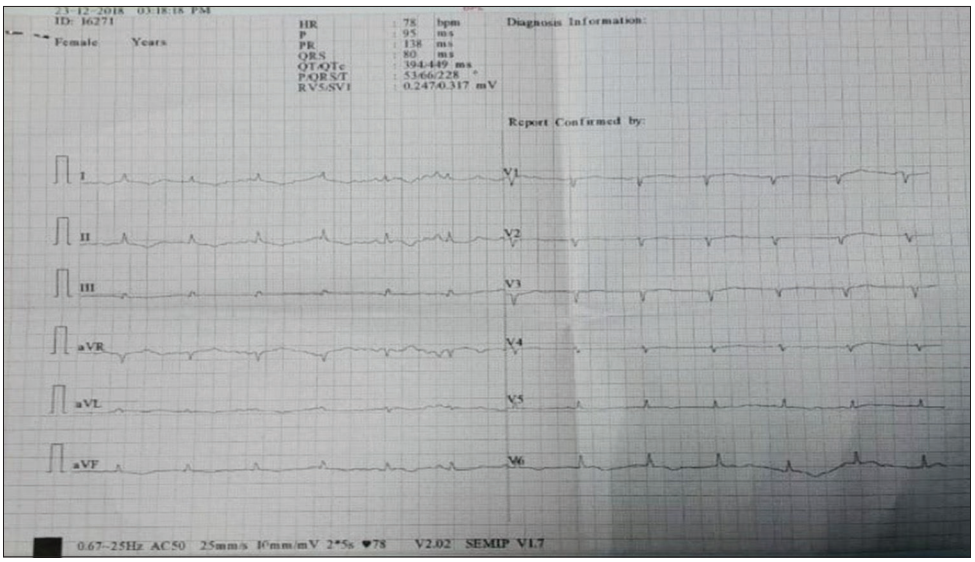

Figure 1: Electrocardiography showing low voltage complexes

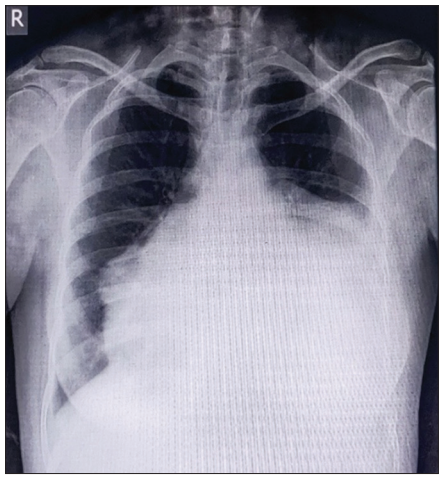

Figure 2: Chest X-ray showing massive cardiomegaly

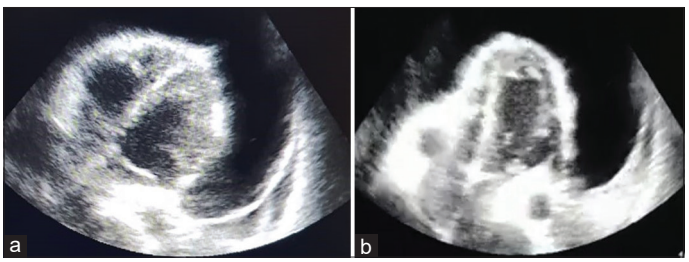

Figure 3: Massive pericardial effusion with the right atrial and ventricular collapse suggestive of cardiac tamponade and normal left ventricular function

pericardiocentesis. After pericardiocentesis, the patient's symptoms improved with the reduction of dyspnea. She was started on thyroxine 200 µg/day. Follow-up at the end of 1 month, she was totally free of symptoms.

DISCUSSION

Hypothyroidism leading on to pericardial effusion is not uncommon but it rarely causes cardiac tamponade. The mechanism of this type of myxedematous pericardial effusion is due to the increased permeability of capillaries and the subsequent leakage of fluid rich in protein into the interstitial space and impaired lymphatic drainage leading on to salt and water retention [1,2].

Because of the insidious and non-specific characteristics of the signs and symptoms of hypothyroidism along with rare occurrence of massive pericardial effusion in some patients, the possibility of hypothyroidism may be overlooked in the differential diagnosis of massive pericardial effusions [7,8].

Jiménez-Nácher *et al*. had cited in his study that until 1992, only 27 cases of cardiac tamponade as a complication of hypothyroidism had been described in the world literature. This low incidence is probably due to the slow accumulation of liquid seen in hypothyroidism [3,4]. Since hypothyroidism is now an easily diagnosed and managed disorder, severe hypothyroidism leading to serious complications is very rarely seen.

Identification of cardiac tamponade in hypothyroidism is difficult clinically and most of the time mistaken for cardiac failure due to its symptoms of lower limb edema, dyspnea, and abdominal distension, hence outlining the importance of bedside echocardiography to differentiate between the two [4,5]. Chest X-ray reveals an enlarged cardiac silhouette, but the gold standard for diagnosis is bedside ECG. Using this tool, emergency physicians can detect a pericardial effusion with a sensitivity of 96%, a specificity of 98%, and overall accuracy of 97.5% [6].

The mainstay in the treatment for the underlying hypothyroidism is simple thyroxine replacement, but in a few exceptional cases, where the patient presents with tamponade urgent pericardiocentesis may be required. In our patient also, pericardiocentesis was performed and about 700 ml of pericardial fluid was aspirated following which she improved symptomatically. On analysis, the pericardial fluid was rich in proteins and lipids and was the characteristic "gold paint" appearance [9,10]. Chen *et al*. [8], Spodick *et al*. [9], and Bajaj *et al*. [10] have all reported case reports similar to our case presented above.

CONCLUSION

Cardiac tamponade is extremely rare in hypothyroidism with few published case reports. The crux lies in the exclusion of other causes of cardiac tamponade and the fact that most of the time there is no associated tachycardia in a tamponade associated with hypothyroidism. Our patient underwent subxiphoid pericardiocentesis with the removal of 700 ml of pericardial fluid which was "golden paint" in color and started on thyroxine replacement. She followed up after 1 month with relief of symptoms.

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