

Original article:

A rare case of cardiac tamponade in a old aged female due to hypothyroidism – A case report

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Abstract

Hypothyroidism is a common endocrine disorder among the middle aged females. Pericardial effusion presenting in a hypothyroid patient is not uncommon, whereas a cardiac tamponade reporting in a patient with hypothyroidism is a rare entity. Here with we present a case of hypothyroidism presenting with a cardiac tamponade. A 60 year old women got admitted to our hospital with the complaints of chest pain, dyspnoea of grade IV , swelling of feet, abdominal distension, hoarseness of voice, prominent neck veins and palpitation for past 2 weeks. She also had the history of reduced urine output, loss of appetite and increase in weight. She is a known case of hypothyroidism but had irregular treatment and follow up. . Her vitals were as follows, pulse rate - 65/mt ; B.P : 90/60 ; respiratory rate- 18/min; the heart sounds were found to be distant and muffled. ECG and echocardiogram confirmed that the patient had a massive pericardial effusion. Under the guidance of Echo, about 700ml of pericardial fluid was aspirated through apical approach. The aspirated fluid was sent to lab analysis and culture. The lab report confirmed it was an exudate fluid and there were no organisms grown in culture. After the fluid aspiration the patient symptoms improved, dyspnoea was reduced. The patient was then started with thyroxin 200 micg/day and was on regular follow-up.

Keywords: Hypothyroidism, pericardial effusion, pericardiocentesis, thyroxine.

Introduction:

Hypothyroidism is a disease which involves multiple systems in our body and presents in various clinical forms. One of the most important cardiovascular complications of hypothyroidism is pericardial effusion. It is more common in chronic hypothyroidism patients who were untreated. The recent review had quoted that the incidence of pericardial effusion among the hypothyroidism patients had ranged between 30% and 75%^{1,2}.

The occurrence of hypothyroidism and cardiac tamponade is not that common. Mostly the patients with massive pericardial effusion secondary to hypothyroidism will be asymptomatic or present with only very few symptoms. Usually it

tends to regress slowly and mostly disappear after several months, when the patients were reverted back to euthyroid.

Another distinguishing feature of pericardial effusion caused by hypothyroidism is the absence of sinus tachycardia, which is more common in pericardial effusion caused by other causes, mainly for maintaining the cardiac output in this condition.³Interventions in the form of pericardiocentesis was usually unnecessary until otherwise there is a significant cardiac tamponade which had developed.⁴

The mechanism of pericardial effusion in hypothyroidism is the occurrence of generalized polyserosopathy in hypothyroidism. The increased

permeability of capillaries to protein accounts for the exudative pericardial effusion in this disorder. In addition, a greater than normal proportion and quantity of exchangeable albumin is localized to the extra vascular space which is aggravated by greater decrease in albumin degradation than albumin synthesis which would result in exudative polyserousopathy.⁵ Echocardiography is the gold standard diagnostic test with a very high sensitivity and specificity in the diagnosis of pericardial effusion.⁶

Echocardiographically the hypothyroid heart can mimic features of both hypertrophic cardiomyopathy and dilated cardiomyopathy which would reverse when the patient becomes euthyroid.⁷ It has been well documented in the literature that the hypothyroidism per se will lead on to concentric left ventricular thickening which would respond gradual thyroxin therapy.⁷ In this context we report a case of primary hypothyroidism presenting with a moderate pericardial effusion.

Case report:

A 60 year old women got admitted to our hospital with the complaints of chest pain, dyspnoea of grade IV, swelling of feet, abdominal distension, hoarseness of voice, prominent neck veins and palpitation for past 2 weeks. She also had the history of reduced urine output, loss of appetite and increase in weight. She is a known case of hypothyroidism but had irregular treatment and follow up. Physical examination showed she is obese with a BMI of 31.5, her face was puffy, thyroid gland was enlarged and palpable but it was not tender and there were no nodules on palpation. Bilateral pitting pedal edema was present and the reflexes were pseudomyotonic. The pulses felt in all four limbs but weak. Her vitals were as follows, pulse rate - 65/mt; B.P : 90/60; respiratory rate- 18/min; the heart sounds were found to be distant and muffled.

The following blood investigations were conducted on the patient. The complete hemogram showed Hb : 10.9Gm, TC : 7,100cells/cu.mm, DC : P:66%, L: 30%, E:04%; Blood ESR : 10 & 20 mm at 5 and 10 min; Platelets : 2.01 lakhs/cu.mm; Bleeding Time : 4 mts; Clotting Time : 4.30mts. Urea : 28mg/dl, Serum Creatinine: 0.9mg/dl Serum Cholesterol : 200mg/dl, TGL : 110mg/dl, HDL : 47mg/dl, LDL : 131mg/dl; Liver Function Tests : Normal Study.

The thyroid profile of the patient showed - T3 : 0.3pg/ml, T4 :3.15mic g/dl, TSH : 72.18mic IU/ml

The ECG of the patient showed low voltage complexes (fig 1) with a heart rate of heart rate 61/mt. Chest X-ray showed huge cardiomegaly (fig 2) and the echocardiogram showed large pericardial effusion measuring 22 cm anteriorly and 29 cm posteriorly (fig 3).

Under the guidance of Echo, about 700ml of pericardial fluid was aspirated through apical approach. The fluid was sent to lab for analysis and the report showed were as follows, proteins – 5.6gm/dl; Sugar -98mg/dl; AFB – Negative; Culture-Negative for organisms; Microscopy showed few mesothelial cells, cystic macrophages and occasional lymphocytes and degenerated cells. So the fluid was found to be an exudate.

After the fluid aspiration the patient symptoms improved, dyspnoea was reduced. A repeat X-ray had showed the size of the heart had come to the normal size (fig 4). The patient was then started with Thyroxin 200 micg/day. The patient came for follow up at the end of 1 month and the patient was totally free of symptoms and she is doing well.

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 the impaired lymphatic drainage leading on to salt and water retention⁸. Cardiac tamponade as a complication of hypothyroidism is very rare; Jiménez-Nácher et al had cited in his study that until 1992 only 27 cases had been described in the world literature. This low incidence is probably due to the slow accumulation of liquid and to cardiac distensibility⁷. Factors described as provoking cardiac tamponade include infection, spontaneous pericardial hemorrhage, non-compliance with thyroid therapy, and abdominal paracentesis. Identification of cardiac tamponade in hypothyroidism is difficult and most of the time it was mistaken for cardiac failure due to its symptoms of tachycardia, rise in venous pressure, lower limb edema, and increased cardiac size on radiography, and all these clinical features were present in our study patient.

The primary and the most important phenomenon in cardiac tamponade is the compression of all the four cardiac chambers after the pericardial content reaches the limit of pericardial reserve volume. With smaller cardiac chambers, the myocardial diastolic compliance is reduced and cardiac inflow becomes limited, ultimately equalizing mean diastolic pericardial and chamber pressures. This equalization of pressures is the hallmark of cardiac tamponade⁹.

There are certain pathological and haemodynamical changes which were reported in the literature that describes about the hypothyroid heart. The classical pathological examination of a hypothyroid heart reveals a dilated heart with pale and floppy myocardium. Coronary atherosclerosis is quite common in patients with hypothyroidism. Histopathological examination of the myocardium shows interstitial edema and swelling of the muscle fibers with loss of striations, which is a hallmark of

myocardial muscle. The pericardial sac usually contains fluid rich in protein and mucopolysaccharides¹⁰. In our study patient also we had the pericardial fluid analysis showing rich in proteins.

Reversible echocardiographic abnormalities are usually documented in a hypothyroid heart. Heart dilatation, reduced myocardial contractility, enlarged thickness of the interventricular septum and posterior wall of the left and increase in the left ventricular volume had been described in the earlier studies¹⁰ and in our study also the patients echo picture had shown left ventricular hypertrophy and the dilatation of heart. This state usually mimics hypertrophic and dilated cardiomyopathies, but these abnormalities can be reversed by bringing the hypothyroid state to normal¹¹. It is well documented in the literature that the hypothyroidism can per se lead on to concentric left ventricular thickening that responds to gradually to thyroxin therapy¹².

The main stay in the treatment for the hypothyroid causing pericardial effusion is simple thyroxin replacement, but in few exceptional cases where the patient is presenting with a tamponade mandates urgent pericardiocentesis, in our study also pericardiocentesis was performed on the patient and about 700ml of pericardial fluid was aspirated and patient had become symptom free.

The clinical resolution of pericardial effusion is satisfactory in majority of the hypothyroid patients with thyroxine replacement therapy, but it takes as long as months or years after the patient reach the euthyroid state.¹³ In our patient at the end of one month follow up her thyroid status was brought to almost near normal and she had no symptoms related to cardiovascular system.

Conclusion:

Hypothyroidism at times has rare modes of presentation and on many occasions it might go unrecognised. Hypothyroidism should be ruled out as a underlying cause of pericardial effusion especially in the middle aged females. The treatment is simple and gratifying, where majority

of the patients with mild effusion will get settled with thyroxine therapy alone and only patients with tamponade might need pericardiocentesis and the possibility of recurrence in these patients is very rare if they were properly maintained in a euthyroid state.



Fig: 1 ECG of the patient showing low voltage complexes



Fig:2 Chest X-ray showing huge cardiomegaly



Fig: 3 Echocardiogram of the patient showing large pericardial effusion



Fig 4 : Chest x-ray showing the size of the heart becoming normal after fluid aspiration

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