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Pericardial tamponade in a 65-year-old woman

Celalettin Usalan, Enver Atalar, Filiz Kulb Vural

A 65-year-old woman with a one-month history of weakness and malaise was admitted to hospital because of chest pain, confusion, sweating and severe dyspnoea. Body temperature, blood pressure, pulse rate, and respiratory rate were 35.7°C, 80/60 mmHg, 62 beats/min and 38 breaths/min, respectively. Physical examination showed tachypnoea, jugular venous distension, pulsus paradoxus, kussmaul sign, hepatomegaly and diminished heart sounds. Chest X-ray disclosed a symmetrical globular enlargement of the heart (figure 1). Electrocardiogram revealed a reduction in amplitude of the QRS complex and sinus rhythm. Echocardiogram showed a massive pericardial effusion with right atrial and ventricular diastolic collapse. The diagnosis of pericardial tamponade was suggested, and emergency treatment was performed.

Haematological studies revealed a haemoglobin level of 11.6 g/dl, a leucocyte count of $11.8 \times 10^9/l$, and erythrocyte sedimentation rate of 52 mm/h. Serum biochemical profile was in normal range, and tests for viral, rheumatic and collagen disease were negative. Mantoux test was also negative. After stabilizing the patient's clinical condition, further studies were performed to establish the aetiology. Pericardial fluid examination was unremarkable except for the high protein content (4 g/dl), and microbiological cultures and cytologies were negative.

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Figure 1 Admission chest X-ray

Questions

- 1 What is the most probable cause of the cardiac tamponade in this patient?
- 2 What are the major causes of pericardial tamponade?
- 3 How should the patient be managed?

Answers

QUESTION 1

The association of hypotension with relative bradycardia in this case was interesting and suggested the possibility of hypothyroidism complicated by pericardial effusion. The results of thyroid function tests were as follows; serum thyroxine 1.2 µg/dl (normal range 5–12 µg/dl), triiodothyronine 8.8 ng/ml (80–120) and serum thyroid-stimulating hormone 102 µU/ml (0.4–4.8). Thyroid function studies were diagnostic of primary hypothyroidism. Although hypothyroidism is a rare cause of pericardial tamponade, it should be included in the differential diagnosis of cardiac tamponade.

QUESTION 2

Pericardial tamponade may occur in association with pericarditis of almost any cause. The most frequent causes of cardiac tamponade are malignancies followed by idiopathic or viral pericarditis and uraemia (box).

QUESTION 3

The patient should be managed with pericardiocentesis and thyroid replacement therapy.

Outcome

After the diagnosis of pericardial tamponade, percutaneous pericardiocentesis was performed immediately with a catheter and after removal of 250 ml of fluid from the pericardial sac the blood pressure gradually returned to normal and a considerable improvement in haemodynamics was seen. Because the aetiology of our patient was primary hypothyroidism, thyroid replacement treatment was started with levothyroxine 0.025 mg/day, with progressive increase of dosage. When the patient's thyroid function reached an euthyroid state after 2 months of therapy, chest X-ray showed marked diminution of cardiac size (figure 2). Echocardiography was repeated and showed minimal pericardial fluid.

Figure 2 Chest X-ray in the euthyroid state, after 2 months of thyroid replacement therapy

Common causes of cardiac tamponade

- malignant disease
- idiopathic pericarditis
- uraemia
- bacterial
- tuberculosis
- cardiomyopathy (receiving anticoagulants)
- acute myocardial infarction (receiving heparin)
- diagnostic procedures with cardiac perforation
- dissecting aortic aneurysm
- postpericardiotomy syndrome
- radiation
- myxoedema (a rare cause of pericardial tamponade)

Discussion

Hypothyroidism is associated with increased capillary permeability and impaired lymphatic drainage with subsequent leakage of protein into the interstitial space, resulting in pericardial effusion, a common clinical finding in overt hypothyroidism. The incidence has been reported as between 3% and 80% in several studies.^{1,2} No correlation appears to exist between the development of pericardial effusion and severity or duration of hypothyroidism. Pericardial effusion in hypothyroidism is rarely complicated by pericardial tamponade, and may be partly accounted for by slow fluid accumulation. The presentation and clinical courses of pericardial effusion in hypothyroidism are extremely variable. It may rarely be the major presenting manifestation of thyroid disease.^{3,4} Most pericardial effusions due to hypothyroidism slowly regress after thyroid replacement. Rarely, pericardial effusion persists despite adequate thyroid therapy. And more rarely recurrent tamponade can be seen despite adequate thyroxine therapy.⁵ The classical clinical picture in pericardial tamponade includes chest pain, confusion, and dyspnoea associated with hypotension and tachycardia. The association of hypotension with relative bradycardia in this case was of interest and suggested the possibility of hypothyroidism complicated by pericardial effusion.

The diagnosis of hypothyroidism is frequently overlooked. It is important therefore, to carry out appropriate tests for thyroid function as well as echocardiography in patients with an enlarged cardiac silhouette of undetermined origin.

Final diagnosis

Hypothyroidism complicated by pericardial tamponade.

Keywords: hypothyroidism; pericardial tamponade

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Postural hypotension and electrolyte disturbances in a 61-year-old man

L R Ranganath, S R Gould

A 61-year-old man, in apparent previous good health, presented to hospital with persistent dizziness and two attacks of postural syncope, all with a duration of less than a month. His blood pressure was 100/70 and 80/55 mmHg in the recumbent and upright postures, respectively. His pulse was 72 beats/min, regular, and all accessible peripheral pulses were palpable; the rest of the cardiovascular system examination was normal. He denied any drug therapy or gastrointestinal fluid losses. His serum electrolytes are shown in table 1.

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Table 1 Serum and urinary electrolytes

	<i>Serum (ref range)</i>	<i>Urine</i>
Sodium (mmol/l)	120 (133–149)	<10
Potassium (mmol/l)	2.5 (3.6–5.2)	21
Chloride (mmol/l)	72 (96–108)	—
Bicarbonate (mmol/l)	33 (24–30)	—
Urea (mmol/l)	26.3 (2.3–6.3)	—
Creatinine (μmol/l)	162 (50–130)	12 800
Osmolality (mOsm/kg)	266 (285–295)	401

Questions

- 1 What diagnoses would the serum and urine electrolytes suggest?
- 2 What treatment should this man receive?