CASE REPORT

Unexplained recurrent pericardial effusion: a lethal warning?

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A case of a 37 year old man with cardiac angiosarcoma causing recurrent pericardial effusion, who eventually died of cardiac rupture, is presented. The diagnosis was not established until the postmortem examination despite echocardiography, pericardiocentesis, and pericardial biopsy investigations. There is neither a specific manifestation that enables early recognition nor well proven effective treatment against this disease. Accordingly, the prognosis of cardiac angiosarcoma remains grave. A high index of suspicion is recommended in patients who present with unexplained pericardial effusion.

Pericardial effusion is the manifestation of a diversity of underlying diseases. Patients may be asymptomatic or in severe dyspnoea, depending on the rate of accumulation of pericardial fluid. Common causes are infection, malignancy, aortic dissection, and open heart surgery. Pericardial effusion that develops after cardiac surgery can easily be diagnosed by a patient's clinical history. Similarly, pericardial effusion secondary to aortic dissection is usually accompanied by intense chest or interscapular pain and is easily diagnosed by imaging techniques. On the other hand, patients presenting with recurrent pericardial effusion accompanied by a non-specific history, especially with negative laboratory tests, can pose a diagnostic dilemma. Cardiac angiosarcoma is a very rare malignant tumour of the heart that typically manifests as unexplained recurrent pericardial effusion.^{1,2} We present a case of cardiac angiosarcoma presenting with recurrent pericardial effusion. The diagnosis was not recognised until the postmortem examination.

CASE REPORT

A previously healthy 37 year old man was admitted because of a four days history of fever, headache, sore throat, and facial puffiness. Physical examination was unremarkable except for mildly engorged jugular veins. Blood tests including complete blood count, erythrocyte sedimentation rate, liver and renal biochemistry, and clotting profiles were all normal. However, chest radiography showed a globular shaped heart. Two dimensional echocardiogram showed massive pericardial effusion (2.5 cm) with right ventricular diastolic compression, suggesting a tamponade effect. On pericardiocentesis, a total of 1300 ml of blood stained pericardial fluid was drained. Total cell count of the drained fluid was 4720×10^6 (neutrophils 93%, lymphocytes 2%). The drained fluid was negative for malignant cells and bacterial cultures including culture for acid fast bacilli.

However, serial echocardiograms in the outpatient department showed reaccumulation of pericardial effusion requiring repeated pericardiocentesis. Pericardotomy was eventually performed and pericardial biopsy showed a monolayer of hypertrophied mesothelial cells that contained fine haemosiderin granules. There was a thin layer of fibrin on the surface

and the vessels in the subjacent stroma were engorged. No granuloma or malignancy was seen. Although the diagnosis remained mysterious at that time, the patient was stable and was discharged. Computed tomography (CT) of the thorax as an outpatient was arranged.

Three weeks after discharge (before CT), the patient was readmitted because of sudden onset of dyspnoea. He deteriorated rapidly into respiratory failure requiring intubation and mechanical ventilation. Chest radiography showed new onset massive right sided pleural effusion, in addition to mild cardiomegaly. An echocardiogram showed only a thin rim of pericardial effusion. Heavily blood stained plural fluid (4 l) was drained upon chest drain insertion. The patient developed refractory hypotension, despite temporary chest drain clamping and vigorous fluid replacement, followed rapidly by cardiac arrest. Resuscitation was unsuccessful.

Figure 1 Anterior half of coronally sliced heart viewed from the posterior. An intramural variegated tumour was present in the right atrium. It invaded the myocardium and perforated the pericardium (indicated by a stick). The pericardial sac was completely obliterated by organised haematoma and tumour nodules.

Figure 2 Photomicrograph of the cardiac tumour. The tumour is composed of atypical cells forming anastomosing vascular spaces (arrowhead). Intracytoplasmic lumina is conspicuous. Papillary tufts into blood lakes are seen, which are characteristics of angiosarcoma (arrow). Haematoxylin and eosin stain, original magnification $\times 150$.

A necropsy was performed to establish the exact cause of death. The heart weighed 1085 g and was greatly enlarged. The whole pericardial sac was diffusely and completely obliterated by organised haematoma and multiple tumour seedlings of varying in size from 0.5–1 cm in diameter. A variegated, multilobular, and fungating tumour of $4 \times 4 \times 3$ cm was present intramurally arising from the auricular region of the right atrium (fig 1). Subsequent microscopic and immunohistochemical studies confirmed cardiac angiosarcoma (fig 2). The tumour extended to the root of the superior vena cava. It invaded the full thickness of myocardium and had eroded through the pericardium around the right atrial region, producing a perforation 0.5 cm in diameter. The perforated site directly connected the right atrium with the right pleural cavity. The right pleural cavity contained massive amounts of blood and blood clots 2400 ml in volume, which directly contributed to the immediate cause of death. Multiple foci of intravascular spread of the tumour were found. Metastatic tumour was noted involving both lungs, the tonsils, and the first part of the duodenum.

DISCUSSION

Cardiac angiosarcoma is a very rare malignant tumour of the heart with a predilection for the right atrium.^{3–5} It commonly occurs in middle aged men. Clinical presentations are often non-specific, depending on the cardiac location of the tumour, degree of myocardial and regional involvement, and presence or absence of metastasis.^{2,3} Nevertheless, recurrent unexplained pericardial effusion is a common manifestation. However, the rarity of the disease and non-specificity of the symptoms often make it difficult to diagnose. In fact, most of the

diagnoses are made after death and even if the diagnosis is made promptly, the majority of the patients already have metastasis.³ Our patient had these characteristics.

The prognosis of cardiac angiosarcoma is notoriously grave, with a median survival time of 3–6 months.^{1,3,6} Despite the absence of randomised trials proving efficacy, surgical excision is the mainstay of treatment. However, local or distant recurrence is common. Until recently, only anecdotal experiences of long term survivors treated with surgery and adjunctive chemotherapy or radiotherapy have been reported.^{7,8} Heart or heart–lung transplantation has been carried out in selected patients with limited success.^{9,10}

At present, there is no known specific manifestation of cardiac angiosarcoma that facilitates early diagnosis. Subjecting every patient with recurrent pericardial effusion to CT or magnetic resonance imaging is certainly not cost effective and has not been shown to improve survival. We believe that the catastrophic outcome of our patient would not have been changed even if the diagnosis had been made earlier. He already had numerous extracardiac metastases at the post-mortem examination and the period from presentation to death was very short (10 weeks). Nevertheless, prompt diagnosis and commencement of surgical treatment with or without adjunctive treatment remain the most efficient approach. Cardiac transplantation may have a role in the future for patients with localised disease. Given that recurrent pericardial effusion is the common presentation, our case report highlights the importance of recognising cardiac angiosarcoma as a possible, albeit rare, cause. A high index of suspicion is therefore recommended for patients presenting with unexplained recurrent pericardial effusion. CT or magnetic resonance imaging can be an effective screening method when in doubt.

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