

**CASE REPORT**

## **Cardiac Tamponade: A Rare Initial Presentation of Thymoma**

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### **ABSTRACT**

Thymomas represent the predominant type of neoplasm of the anterior mediastinum, constituting approximately a quarter of all tumours found within the mediastinal region. They can present in various ways, including as asymptomatic incidental findings, paraneoplastic syndromes, or symptoms due to the tumour's spread within the thorax. In advanced cases, pericardial and pleural effusions may develop. Nevertheless, it is extremely rare for a thymoma to initially manifest as a spontaneous bleeding into the pericardial space, resulting in cardiac tamponade. This report illustrates a case of an elderly woman who presented with shortness of breath, reduced effort tolerance, cough, appetite loss, and weight loss. Examination revealed tachycardia, hypotension, distended jugular veins, and muffled heart sounds. Investigations showed anaemia, transaminitis, elevated inflammatory markers, and cardiomegaly with pleural effusions. Echocardiography confirmed cardiac tamponade, and pericardiocentesis drained 1000 ml of haemorrhagic pericardial fluid. CT imaging revealed a large anterior mediastinal mass compressing major vessels. Histopathology confirmed WHO type B2 thymoma. Due to unresectability of the tumour, the patient received palliative chemotherapy but showed disease progression. This case highlights cardiac tamponade as a rare initial presentation of thymoma and emphasises the importance of considering mediastinal



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malignancy in unexplained pericardial effusions.

## INTRODUCTION

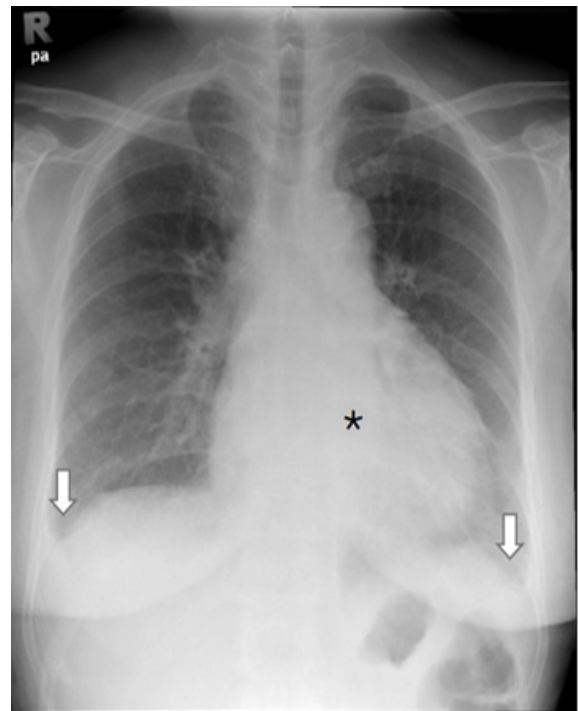
Thymomas are uncommon epithelial tumours originating from the thymus, comprising 20-25% of mediastinal tumours and representing under 1% of adult malignancies, with an estimated annual occurrence ranging from 0.13 to 0.32 per 100,000 individuals (Alqaidy, 2023; Hsu et al., 2019). According to the World Health Organisation (WHO), thymomas are classified into types A, AB, B1 through B3, as well as thymic carcinomas, each exhibiting different clinical behaviours ranging from indolent to aggressive or metastatic (Alqaidy, 2023; Travis et al., 2015). Around 45% of affected individuals exhibit paraneoplastic syndromes like myasthenia gravis. In contrast, others remain asymptomatic until the tumour grows large enough to cause symptoms such as shortness of breath, chest pain or superior vena cava compression syndrome (Alqaidy, 2023; Robinson & Akhondi, 2025). Advanced thymomas can invade nearby structures, leading to pericardial and pleural effusions in about 20% of cases, though haemorrhagic effusion that precipitates cardiac tamponade is considered extremely rare (Khan et al., 2019; Parthiban & Sani, 2022).

The occurrence of cardiac tamponade as a presenting feature of thymoma poses a significant diagnostic challenge, with fewer than 20 cases reported worldwide, often involving aggressive subtypes (Takashima et al., 2022). While pericardial effusions in thymoma are typically serous, haemorrhagic variants may arise from vascular invasion or tumour necrosis, necessitating urgent intervention (Cheng et al., 2005b). In this report, we examine a case involving a 69-year-old patient whose diagnosis of thymoma followed an emergent diagnosis of cardiac tamponade, highlighting the need for rapid multidisciplinary evaluation of unexplained pericardial emergencies in the context of

mediastinal pathology.

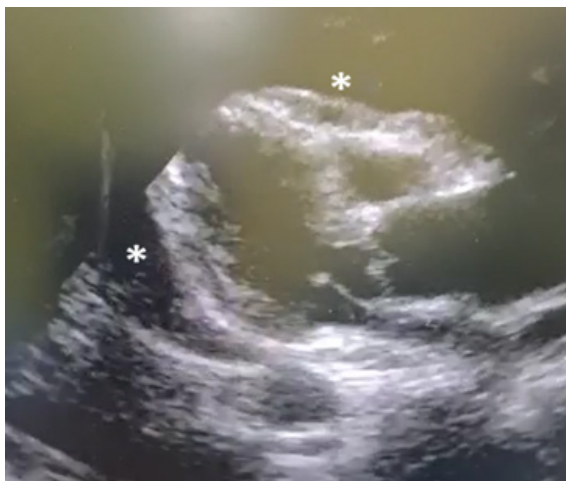
## CASE PRESENTATION

A 69-year-old female patient, known to have type 2 diabetes mellitus and hypertension, arrived at the emergency department complaining of a three-day history of shortness of breath, a two-month history of reduced effort tolerance, and occasional nonproductive cough for two months, along with loss of appetite with unintended 5 kg weight loss for the past two months. On physical examination, she was tachycardic (110 bpm) with pulsus paradoxus, hypotensive, distended jugular veins, and muffled heart sounds. Laboratory tests showed mild normocytic normochromic anaemia and transaminitis, with markedly high erythrocyte sedimentation rate and C-reactive protein. Sinus tachycardia without electrical alternans was noted on her electrocardiogram. A chest radiograph suggested cardiomegaly associated with bilateral pleural effusion (Figure 1).



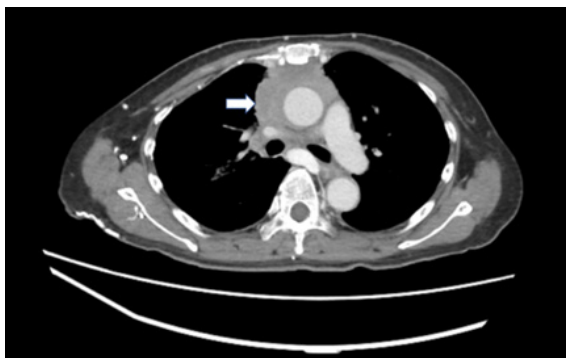
**Figure 1:** Chest X-ray PA view showing cardiomegaly (Asterisks) and bilateral pleural effusion (Arrow)

Transthoracic echocardiogram indicated cardiac tamponade with right ventricular diastolic collapse (Figure 2). Due to hemodynamic instability, emergent pericardiocentesis was performed, draining 1000 ml of bloody pericardial fluid, resulting in significant symptomatic improvement.



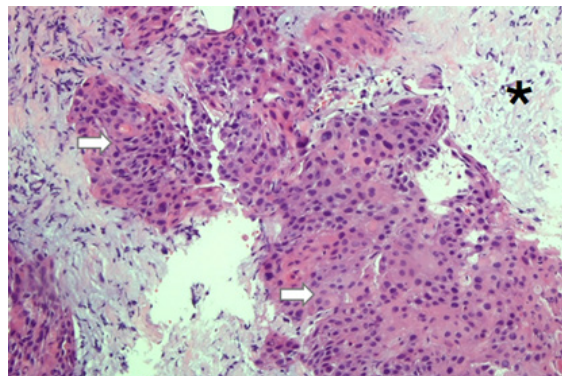
**Figure 2:** Transthoracic echocardiography (TTE) showing pericardial effusion (Asterisks)

A thoracic computed tomography scan detected a huge lobulated mass at the anterior mediastinum encasing and compressing the superior vena cava and brachiocephalic veins, along with pericardial and bilateral pleural effusions (Figure 3). A biopsy of the mass, performed under CT guidance, revealed malignant cells, leading to a diagnosis of thymoma due to its very close proximity to the large vessels.



**Figure 3:** Computed tomography (CT) thorax showing anterior mediastinal mass (Arrow)

The histologic examination showed malignant cells in a desmoplastic background with moderately pleomorphic nuclei, inconspicuous nucleoli, and moderate to ample eosinophilic cytoplasm with evidence of keratinisation (Figure 4).



**Figure 4:** The histologic hematoxylin and eosin stain section shows malignant cells in a desmoplastic background showing moderately pleomorphic nuclei, inconspicuous nucleoli and moderate to ample eosinophilic cytoplasm (Arrows) with evidence of keratinization (Asterisks).

Through multidisciplinary discussion, the thymoma is deemed unresectable and high surgical risk due to its very close proximity to the large vessels. Thus, the patient was started on palliative chemotherapy with paclitaxel and carboplatin. After three cycles, a follow-up CT scan showed disease progression. Patient was counselled for radiotherapy; however, she was not keen. The patient is currently asymptomatic and continues to be monitored with serial CT scans.

## DISCUSSION

Cardiac tamponade as the initial presentation of thymoma is exceptionally rare and presents significant diagnostic and therapeutic challenges. Thymoma represents the most common anterior mediastinal tumours, responsible for 20-25% of mediastinal tumours

and half of anterior mediastinal masses. (Takanami et al., 1999) They are relatively uncommon; the reported incidence is 0.15 per 100,000 population (Engels & Pfeiffer, 2003).

The development of cardiac tamponade as the first clinical manifestation is exceedingly uncommon and has only been described in a small number of case reports (Iqbal et al., 2013; Sakamaki et al., 2007; Lee et al., 2004). Roughly 33% to 50% of individuals with thymoma do not exhibit symptoms, while 33% experience symptoms due to the tumour pressing on nearby structures, such as chest pain, difficulty breathing, and superior vena cava compression syndrome. (Wright & Kessler, 2005) . Pericardial effusion is a rare initial manifestation of thymoma, seen in approximately 20% of cases.

Malignant pericardial effusions leading to cardiac tamponade are most frequently associated with metastatic involvement from lung, breast, or hematologic malignancies (Maisch et al., 2004). Despite the anatomic proximity of thymomas to the pericardium, clinically significant pericardial involvement is rare. When it does occur, it is usually subclinical or presents late in the disease course (Iqbal et al., 2013). The mechanism is typically direct invasion or rupture of the tumour into the pericardial space, resulting in serous or haemorrhagic effusion (Iqbal et al., 2013; Sakamaki et al., 2007).

In this report, the patient arrived with typical signs of breathlessness, cough, along with constitutional symptoms. As the tumour grew, it resulted in pericardial effusion and subsequently led to cardiac tamponade, causing heart failure and shock necessitating emergent pericardiocentesis. The haemorrhagic nature of the pericardial fluid raised suspicion of an underlying malignancy. Imaging revealed a large anterior mediastinal mass with pericardial and pleural effusions, and histopathology confirmed thymoma. This sequence of events highlights the importance

of considering thymoma in the differential diagnosis of unexplained pericardial effusion or tamponade, especially when a mediastinal mass is present on imaging.

This case underscores the need to include thymoma in the differential diagnosis of cardiac tamponade, in addition to more common causes such as idiopathic pericarditis, drug-related, tuberculosis, or post-radiation effects that can lead to massive pericardial effusion (Colombo et al., 1988).

The Masaoka grading system is commonly used in thymoma to support treatment decisions. In this case, the thymoma was classified as stage III, indicating macroscopic infiltration into the pleura and pericardium (Masaoka, 2010). Histologically, the tumour was identified as WHO type B2 thymoma as it is more epithelial cells with still prominent lymphocytes, and the TNM stage was IV B. The tumour is not suggestive of thymic carcinoma, as the nuclear pleomorphism is moderate and there is no evidence of any subtype of carcinoma (Travis et al., 2015b; Kim et al., 2005). Prognosis for stage III thymomas is generally poor, with 27% of patients developing recurrent disease after complete resection. In cases where only incomplete surgical resection is possible, 62% of patients experience tumour relapse (Ströbel et al., 2004).

Management of unresectable thymoma with cardiac tamponade is complex and requires a multidisciplinary approach. Emergency pericardiocentesis remains the mainstay for immediate hemodynamic stabilisation. Further therapy is guided by tumour staging and resectability. In cases where surgical resection is not feasible, as in our patient due to vascular encasement, systemic chemotherapy and/or radiotherapy are considered (Girard et al., 2015). Unfortunately, our patient demonstrated disease progression despite platinum-based chemotherapy, underscoring the aggressive

nature and poor prognosis associated with advanced, unresectable thymoma.

## CONCLUSION

In conclusion, this case contributes to the limited literature documenting cardiac tamponade as the initial presentation of thymoma. Clinicians should maintain a high index of suspicion for underlying malignancy, including thymoma, in patients presenting with unexplained pericardial effusion and mediastinal masses. Early recognition and prompt intervention are crucial for patient stabilisation and initiation of appropriate oncologic management.

## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this case report.

## CONSENTS

Written informed consent was obtained from the patient. A copy of the consent form is available for review by the Editor-in-Chief.

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