

# Aortic dissection contraindicates pericardiocentesis in cardiac tamponade: We know it, but do we look for it?

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## CASE REPORT

A 55-years-old female was presented to the emergency department with acute onset of chest pain irradiating to the back and orthopnea. Of relevant medical history, the patient had a long standing uncontrolled arterial hypertension and diabetes. On admission, the patient's vital signs revealed asymmetric brachial blood pressure (right arm 95/50 mmHg, left arm: 110/60 mmHg), tachycardia (125 beats/min), and tachypnea (25/min). Examination found external jugular vein distension, hepatojugular reflux, and cold sweaty extremities. Electrocardiography (ECG) showed sinus tachycardia with left ventricular hypertrophy. Transthoracic echocardiography (TTE) revealed large pericardial effusion with signs of hemodynamic compromise, right atrial and ventricular compression, inferior vena cava plethora, and significant flow respiratory variations; it also revealed aortic dilatation and mild central aortic insufficiency. Subsequent chest CT scan displayed type A aortic dissection with pericardial effusion. The patient was transferred to the nearest cardiovascular surgery capable hospital. Unfortunately, the patient died at arrival (Figures 1–3).

## DISCUSSION

Although chest pain is frequent in the emergency department, aortic dissection is rare in clinical practice with an annual incidence of 2–16 cases per 100,000 [1].

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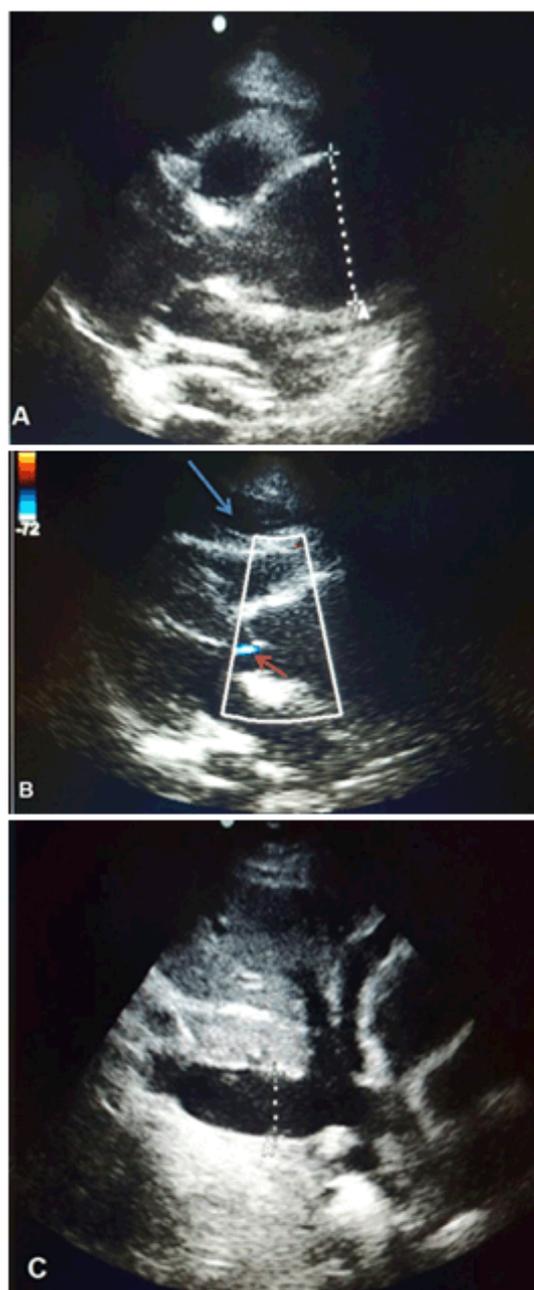


Figure 1: (A) Transthoracic echocardiography showing ascending aorta dilatation, (B) Central aortic regurgitation (red arrow) with compressive pericardial effusion (blue arrow), and (C) Inferior vena cava plethora.

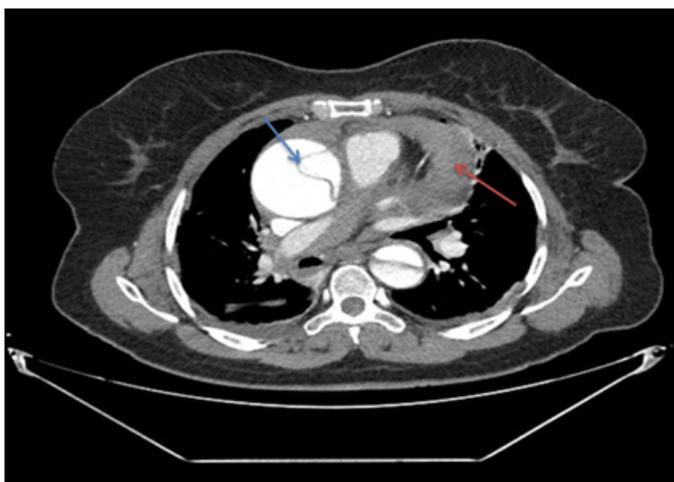


Figure 2: Axial chest computed tomography scan showing type A aortic dissection with intimal flap (blue arrow) and pericardial effusion (red arrow).

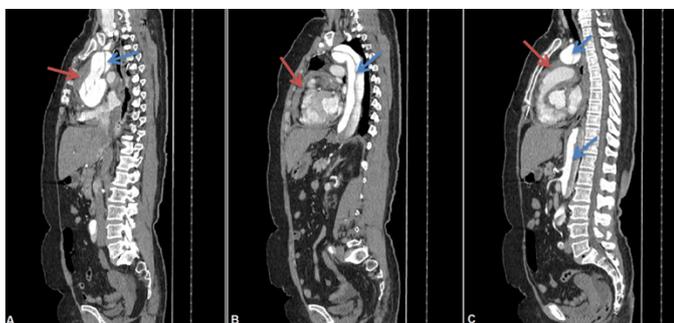


Figure 3: Sagittal computed tomography reconstructions showing type A aortic dissection extending to the aortic arch and descending aorta (blue arrows) along with pericardial effusion (red arrow).

However, this incidence is underestimated because many patients die before arrival at hospital. In fact, autopsic series report a prevalence ranging from 0.2–0.8% [2]. It is often a fatal disease with an overall hospital mortality rate of 27.4%, raising to 58% (1% per hour) in the case of DEBAKEY's type A aortic dissection in the absence of urgent surgical treatment [1, 3].

Cardiac tamponade occurs in 20% of type A aortic dissection. It is associated with a two-fold higher mortality [4, 5], and is the leading cause of early hospital death in patients with aortic dissection [6]. This association remains a very challenging diagnostic and therapeutic problematic.

Dealing with a pericardial effusion, in emergency department setting, the physician strives to look for clinical and echocardiographic signs of tamponade, and to carry out, when appropriate a pericardiocentesis. Meanwhile, he/she may omit exploration of the ascending aorta and fail to diagnose a type A aortic dissection ruptured in the pericardium, in which case pericardiocentesis can be harmful and aggravate the leakage and hemorrhage [7]. Transthoracic echocardiography is not the best imaging

test for studying the aorta, nonetheless it remains a valuable and largely available tool to screen for type A aortic dissection by looking for its indirect signs (aortic regurgitation, pericardial effusion and dilatation of the initial aorta) or the presence of an intimal flap in the lumen of the ascending aorta, which will affirm the diagnosis, thus rendering pericardiocentesis and pericardial drainage contraindicated.

In case of tamponade-complicated type A aortic dissection, pericardial drainage and pericardiocentesis are contraindicated due to a rebound increase in aortic pressure that occurs after evacuation of the effusion leading to hemorrhage and tamponade recurrence [8]. The treatment of choice, in this setting, is urgent surgical repair of the aorta with pericardial drainage. Indeed, in the absence of surgical repair almost all patients tamponade die during their first hospital admission [4]. In addition, surgery reduces mortality at 1 month from 90–30% [9]. Some authors, however, authorize pericardiocentesis when urgent cardiac surgery is not available [1, 10].

## CONCLUSION

It is no exaggeration to say that type A acute aortic dissection ruptured in the pericardium is the worst disaster that the human vascular network can experience. This association poses a real challenge to the physician. Cardiac tamponade may overshadow aortic dissection which contraindicates, in principle, pericardiocentesis. We would like to emphasize, through this case, the crucial importance of searching for direct and indirect echocardiographic signs of aortic dissection when managing any pericardial effusion, let alone cardiac tamponade.

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**Keywords:** Aortic dissection, Cardiac tamponade, Echocardiography

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### Author Contributions

Jamal El Ouazzani – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Amine Ghalem – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

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### Guarantor

The corresponding author is the guarantor of submission.

### Conflict of Interest

Authors declare no conflict of interest.

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