Massive right pleural effusion leading to cardiac tamponade in absence of pericardial effusion: a rare presentation

Kunal Mahajan, Sanjeev Asotra, Prakash Negi, Gunjan Gupta

Department of Cardiology,
Indira Gandhi Medical College,
Shimla, Himachal Pradesh,
India

Correspondence to

Dr Kunal Mahajan,
kunalmahajan442@gmail.com

Accepted 21 January 2016

DESCRIPTION

A 40-year-old man with massive right sided pleural effusion was referred for echocardiography to assess ventricular function. His transthoracic echocardiogram revealed a large right pleural effusion. It was causing inversion of the right atrium (figure 1 and video 1) in systole and diastole (figure 2), for most of the cardiac cycle. Prolonged right atrial collapse that exceeds one-third of the cardiac cycle is considered 100% specific and 94% sensitive for clinical cardiac tamponade.¹ Notably, there was no pericardial effusion in our patient on echocardiography, which was later also confirmed on CT scan (figure 3). The patient had distension of the veins in his neck and his blood pressure was 90/70 mm Hg. Thoracocentesis was carried out and around 1.5 L of pleural fluid tapped. Echocardiography was repeated 2 h later and showed marked improvement in right atrial expansion (figure 4 and video 2). Chest X-ray also demonstrated a decrease in pleural effusion (figure 5) associated with significant improvement in blood pressure.

Video 1 Transthoracic echocardiogram, apical four-chamber view, demonstrating a large right pleural effusion (PL EFF) causing compression of the right atrium (RA). Note that the compression is present throughout the cardiac cycle.

There are few reports regarding the adverse impact of large pleural effusion on cardiovascular haemodynamics; this condition can manifest as cardiac tamponade.² It is hypothesised that the mechanism of chamber collapse is related to the pleural effusion generating a positive intrathoracic pressure, which in turn causes chamber collapse.

Figure 1 Transthoracic echocardiogram, apical 4-chamber view, demonstrating a large right pleural effusion (PL EFF) causing compression of the right atrium (RA).

Learning points

- ▶ Prolonged right atrial collapse on echocardiography is a highly specific and sensitive sign for cardiac tamponade, and can be present in conditions other than pericardial effusion.
- ▶ Large pleural effusions may be associated with signs of cardiac tamponade.
- ▶ Thoracocentesis leads to reversal of this clinical picture.

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To cite: Mahajan K, Asotra S, Negi P, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-214342

Figure 2 Right atrial (RA) compression is noted throughout the cardiac cycle. RA is relatively expanded in early diastole (A) and then progressively compressed late in diastole (B) and in most of systole (C and D).

Figure 3 CT of the thorax, axial view, showing moderate right pleural effusion. Note that the left sided pleural cavity is clear and there is no pericardial effusion.

Video 2 Transthoracic echocardiogram, apical four-chamber view, demonstrating better expansion of the right atrium (RA) post-thoracocentesis.

Figure 4 Echocardiographic comparison of prethoracocentesis and post-thoracocentesis compression of RA. Note the collapse of RA prethoracocentesis (A), which was relieved post-thoracocentesis (B).

Figure 5 Chest X-ray comparison prethoracocentesis and post-thoracocentesis. (A) Right hemithorax prethoracocentesis. (B) Chest X-ray post-thoracocentesis, still showing massive right pleural effusion.

This clinical picture resolves after drainage of the pleural effusion.³

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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