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## Visual Journal of Emergency Medicine

journal homepage: [www.elsevier.com/locate/visj](http://www.elsevier.com/locate/visj)

## Cardiac tamponade presenting as leg swelling

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## ARTICLE INFO

## Keywords:

Pericardial effusion

Tamponade

Leg swelling

## Visual case discussion

A 49-year-old woman with a history of HIV, hypertension, and chronic kidney disease stage 3 presented to the emergency room with progressive leg swelling for 2 months. She was started on furosemide 40 mg twice daily by her HIV clinic physician a week prior.

In triage, her vitals were a blood pressure of 211/150 mmHg, heart rate 106, respiratory rate 14, and spO<sub>2</sub> 98% on room air. Her exam demonstrated jugular venous distention and bilateral lower extremity pitting edema extending proximally to the thighs, sacrum, and the abdominal wall. Her lungs were clear on auscultation. An electrocardiogram showed T-wave inversions in v4-v6 but was otherwise unremarkable. Chest x-ray demonstrated cardiomegaly (Fig. 1). Laboratory workup was significant for a BNP of 22,225.

Point-of-Care ultrasound (POCUS) was performed to further assess the heart. The parasternal long axis view showed a pericardial effusion and right ventricle (RV) collapse during diastole which corresponds to when the mitral valves (MV) opens (Fig. 2). Early diastolic RV collapse is the most specific sign for pericardial tamponade.<sup>1</sup> A plethoric IVC was also seen.

Cardiology was consulted and the patient was admitted to the cardiac intensive care unit. The following morning a pericardiocentesis drained 200 cc of serosanguinous fluid, with an additional 700 cc of drainage overnight.

In subacute tamponade, compliance of the pericardial sac allows for an accommodation of large volumes of fluid within the pericardium. This case is one such example, where 900 cc of fluid was removed from the pericardium the first day. Peripheral edema and hypertensive vitals are common in subacute tamponade.<sup>2,3</sup> This case highlights the importance of emergency physicians to keep tamponade in the differential as a serious cause in patients that present with peripheral edema over weeks to months.

## Questions

- 1) What is not an ultrasound finding associated with cardiac tamponade?  
 upperLetter%1 RV collapse on diastole  
 upperLetter%1 RA collapse  
 upperLetter%1 Septal bowing

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**Fig. 1.** Chest x-ray. PA view is significant for cardiomegaly but clear lung fields. Lateral view shows obliteration of the retrocardiac space as indicated by the white arrow.

- upperLetter%1 Dilated inferior vena cava with minimal or no collapse with inspiration
- upperLetter%1 Dilated Right Ventricle
- 2) With a Plethoric IVC with minimal respiratory variation, a clinician should consider all of the following except \_\_\_\_
- upperLetter%1 Massive Pulmonary embolism
- upperLetter%1 Pneumothorax
- upperLetter%1 Early Sepsis
- upperLetter%1 Acute Aortic Stenosis
- upperLetter%1 Tamponade

**Answers**

- 1 Answer: E. A dilated RV is not a sign of cardiac tamponade but can be seen in pulmonary embolism
- 2 Answer: C. In early sepsis, a flat IVC is seen. A plethoric IVC with minimal respiratory variation is concerning for outflow tract obstruction.

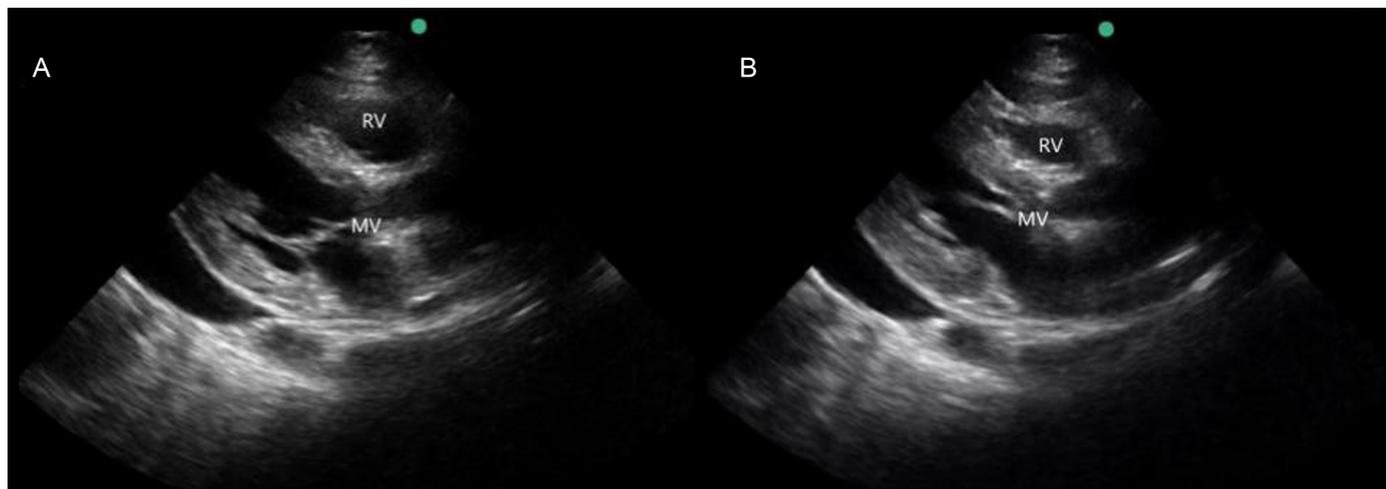
Video 1. Phased array probe. PSLA with pericardial effusion tracking above the descending aorta, scalloping RV during cardiac cycle, and RV collapse on early diastole.

**CRedit authorship contribution statement**

**Jeffrey Kimm:** Conceptualization, Data curation, Writing - original draft, Writing - review & editing. **Michael Halperin:** Conceptualization, Data curation, Writing - original draft, Writing - review & editing. **Vincent Nguyen:** Conceptualization, Data curation, Writing - original draft, Writing - review & editing.

**Declaration of Competing Interest**

The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.



**Fig. 2.** Parasternal long axis view (PSLA) showing the right ventricle during (A) systole, and (B) diastole of the same cardiac cycle. The RV collapse occurs during diastole when the mitral valves (MV) are open, a specific echocardiographic sign of cardiac tamponade.

### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.visj.2019.100639](https://doi.org/10.1016/j.visj.2019.100639).

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