

Learning Objectives

- Cardiac Tamponade may occur in the acute or subacute setting
- Subacute Tamponade may be a diagnostic challenge if clinical suspicion is not high as hypotension is not a common presenting feature and, on the contrary, these patients often present hypertensive
- Unlike acute tamponade, which develops in minutes to hours, subacute tamponade develops over a period of days or even weeks
- Subacute Cardiac Tamponade should be ruled out in patients who present with nonspecific symptoms of fatigue, dyspnea, abdominal fullness despite appearing hemodynamically stable after recent invasive cardiac procedures

Case Presentation

A 65-year-old female with history of paroxysmal atrial fibrillation status post Watchman device placement three weeks prior (on dual antiplatelet therapy), sustained ventricular tachycardia status post implantable cardioverter-defibrillator, heart failure with preserved ejection fraction, hypertension, and chronic kidney disease stage III (CKD-III) who presented with shortness of breath, nausea, and sensation of epigastric fullness for three days duration.

Physical examination:

• Vital signs were remarkable for elevated blood pressure of 154/88 mmHg and tachycardia with a heart rate of 112 beats per minute. Her cardiopulmonary examination revealed elevated jugular vein distention, regular heart sounds, lungs clear to auscultation bilaterally. Distal extremities were warm and without edema.

Clinical features:

• **Laboratory analysis:** showed acute kidney injury (AKI) with creatinine 4.82 mg/dL (from baseline 1.92 two weeks prior).

Case Continued

Clinical features:

- **Electrocardiogram:** low-voltage QRS complexes in precordial leads (figure 1).
- **Bedside point-of-care-ultrasonography (POCUS):** revealed a plethoric inferior vena cava and large pericardial effusion with complete right ventricular (RV) collapse and early right atrial (RA) collapse suggestive of tamponade physiology (figure 2).

Management and clinical evolution:

- She underwent emergent pericardiocentesis with drainage of 500 mL of bloody pericardial effusion. Post-pericardiocentesis POCUS showed resolution of pericardial effusion and tamponade physiology. Her AKI subsequently resolved, and patient was eventually discharged home.

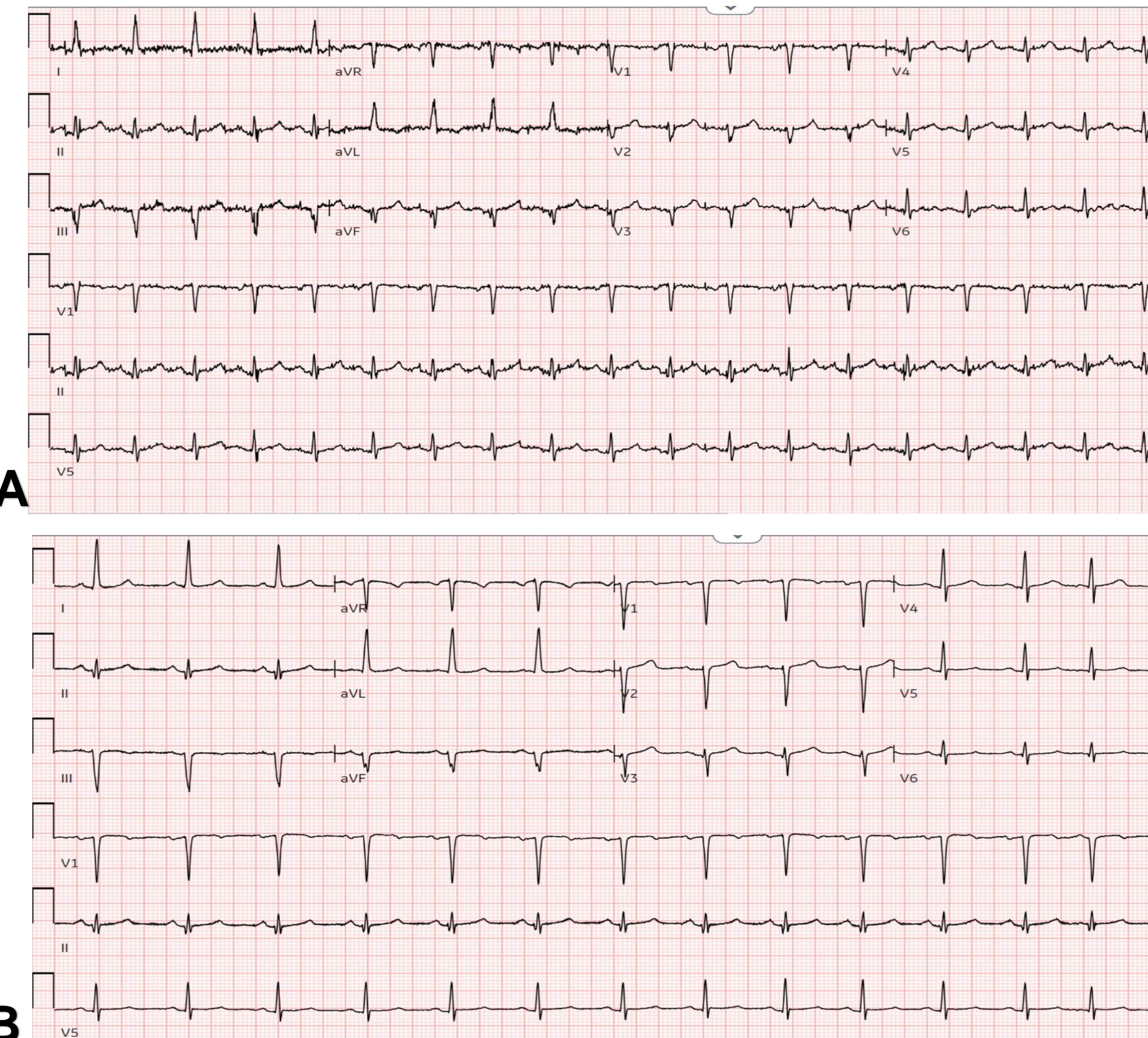


Figure 1. ECG findings of low-voltage QRS complexes in pre-cordial leads leads (A), markedly dampened compared to ECG from three weeks prior (B).

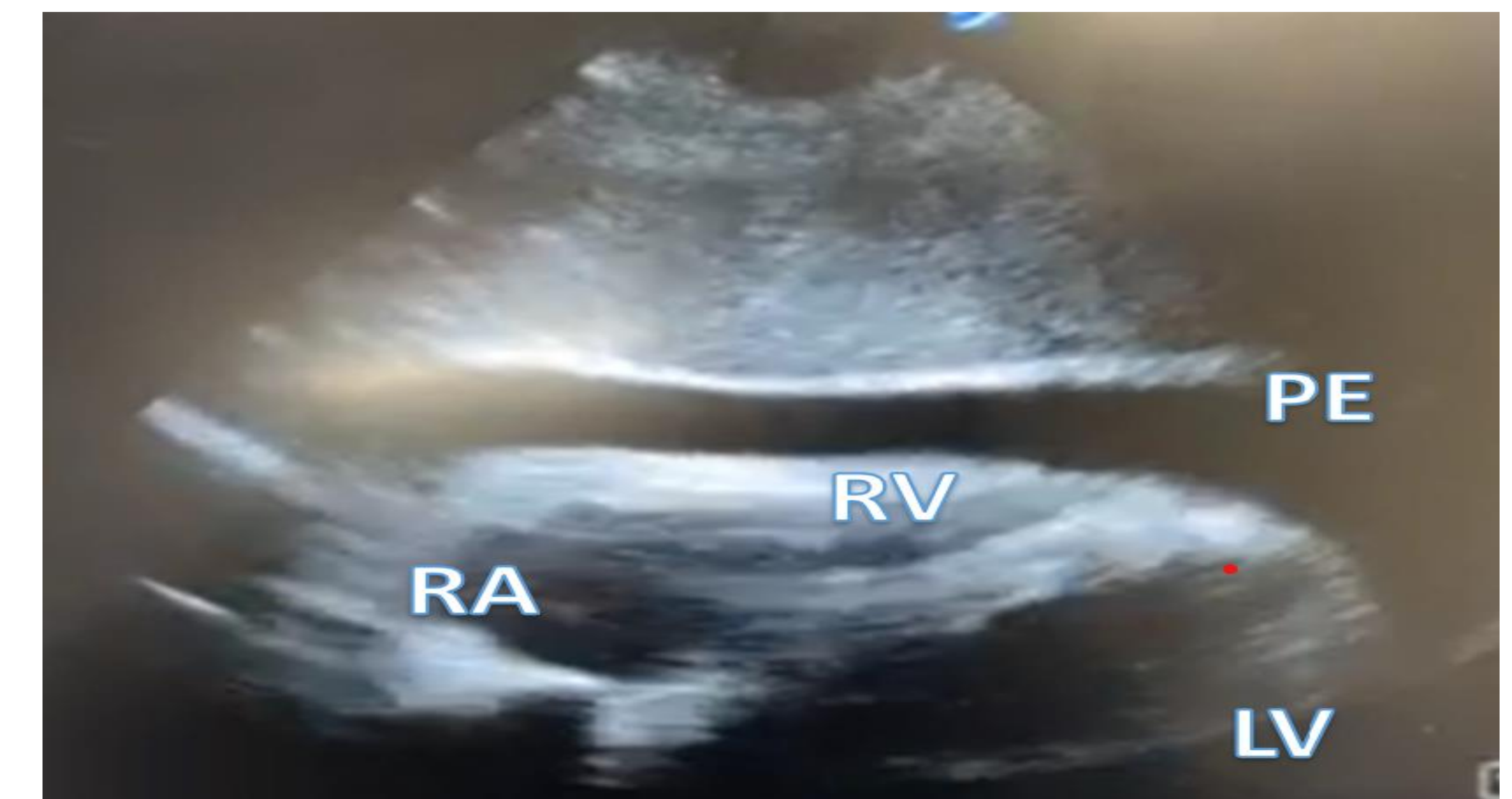


Figure 2. POCUS Subcostal 4-Chamber View showing large pericardial effusion with complete right ventricular collapse and early right atrial collapse suggestive of tamponade physiology

Discussion

- Iatrogenic pericardial tamponade is a rare complication of invasive cardiac procedures, which varies in rate from 1 to 4.8%.
- Although the mechanism underlying the hypertensive response is not completely understood, it is suggested that impaired cardiac filling from pericardial fluid accumulation results in a compensatory sympathetic surge responsible for increased peripheral vascular resistance and tachycardia. Once confirmed, management is pericardiocentesis just as in the acute presentation.
- The clinical presentation of subacute cardiac tamponade is often subtle. A detailed history and the use of auxiliary non-invasive diagnostic modalities such as POCUS are key in the early recognition of potential complications associated with cardiac interventions.

References

- 1) Adamczyk, M., Wasilewski, J., Niedziela, J., Rozentryt, P., & Gąsior, M. (2019). Pericardial tamponade as a complication of invasive cardiac procedures: A review of the literature. *Advances in Interventional Cardiology*, 15(4), 394–403. <https://doi.org/10.5114/aic.2019.90213>
- 2) Argulian, E., Herzog, E., Halpern, D. G., & Messerli, F. H. (2012). Paradoxical hypertension with cardiac tamponade. *The American Journal of Cardiology*, 110(7), 1066–1069. <https://doi.org/10.1016/j.amjcard.2012.05.042>
- 3) Hein, A., & Wai, Y. H. (2022). Subacute cardiac tamponade with massive pericardial effusion. *Cureus*. <https://doi.org/10.7759/cureus.32250>
- 4) Price, M. J., Valderrábano, M., Zimmerman, S., Friedman, D. J., Kar, S., Curtis, J. P., Masoudi, F. A., & Freeman, J. V. (2022). Periprocedural pericardial effusion complicating transcatheter left atrial appendage occlusion: A report from the NCDR Laao Registry. *Circulation: Cardiovascular Interventions*, 15(5). <https://doi.org/10.1161/circinterventions.121.011718>