

Case Report

A rare case of hepatic vein puncture during attempted pericardiocentesis mimicking right atrium perforation

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ABSTRACT

Emergency pericardiocentesis done for hemodynamically significant cardiac tamponade is associated with rare but life-threatening complications including cardiac chamber perforation. Echocardiography is the usual tool to diagnose procedural complications of pericardiocentesis. We are reporting a case of attempted pericardiocentesis where apparent cardiac chamber perforation by saline contrast echo turned out to be an inconsequential hepatic vein puncture.

Keywords: Echocardiography, Hepatic vein, Pericardiocentesis, Tamponade

INTRODUCTION

Evacuation of pericardial fluid by percutaneous drainage is routinely done for diagnostic or therapeutic purposes in many clinical conditions.¹ Currently, ultrasound-guided pericardiocentesis is the recommended practice for hemodynamically significant pericardial effusion.² Reported procedural morbidity and mortality associated with pericardiocentesis are 1-3% and 1% respectively.³ Cardiac chamber perforation is one of the most feared complications of pericardiocentesis.⁴ We are reporting a rare case of clinically inconsequential hepatic vein punctured during pericardiocentesis which mimicked right atrial perforation.

CASE REPORT

A 14-year-old female child presented to the pediatric outpatient department with complaints of loss of appetite, generalised weakness, mild grade fever and dyspnea on exertion. She was evaluated and found to have pulsus paradoxus. She was sent for urgent echocardiography

which showed large circumferential pericardial effusion with mild diastolic right ventricular collapse. Respiratory variation along the AV valve was suggestive of exaggerated ventricular interaction. The patient was planned for pericardiocentesis under conscious sedation and was shifted to the coronary care unit. However, after receiving intravenous midazolam she became hypotensive and blind pericardiocentesis through sub xiphoid space was attempted. Guidewire went easily through the puncture needle and a 5 French sheath was placed over the wire. Aspirated fluid through the sheath appeared as frank blood. Agitated saline was injected through the sheath to confirm its position. Saline contrast was found filling the right atrium and right ventricle on echo (Figure 1). A tentative diagnosis of right atrium puncture was made and the patient was shifted to the cardiac catheterization laboratory for attempted closure using amplatzer duct occluder 2 device. On careful examination of the recorded echo loop, saline contrast was found to fill the right atrium through the superior vena cava. The patient was shifted for cardiac CT which showed a course of pericardiocentesis sheath from a

hepatic vein, inferior vena cave, right atrium and superior venacava (Figure 2 and 3). The tip of the sheath was in superior venacava. A 035-guide wire was introduced through the sheath into the superior vena cava. The sheath was removed keeping the wire in situ to keep the access. A serial blood sample taken at one-hour intervals did not show any fall in haematocrit. Echo-guided pericardiocentesis was done and the guide wire was pulled out after four hours.

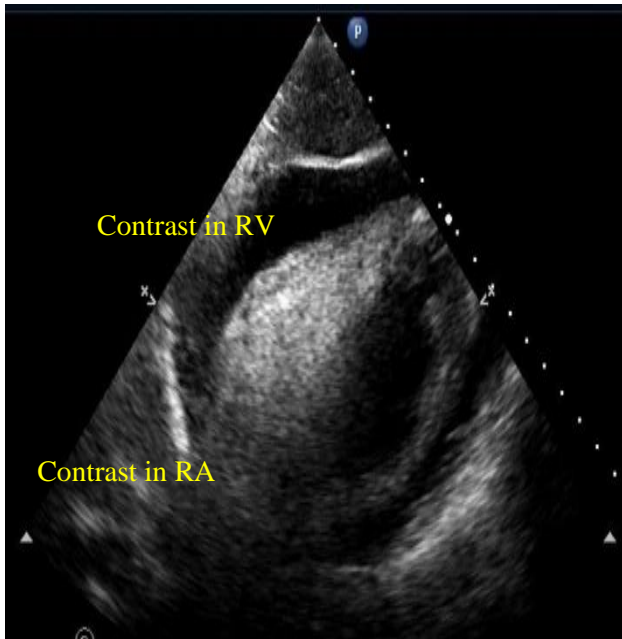


Figure 1: Saline contrast through pericardiocentesis sheath filling right atrium and right ventricle on echocardiography.

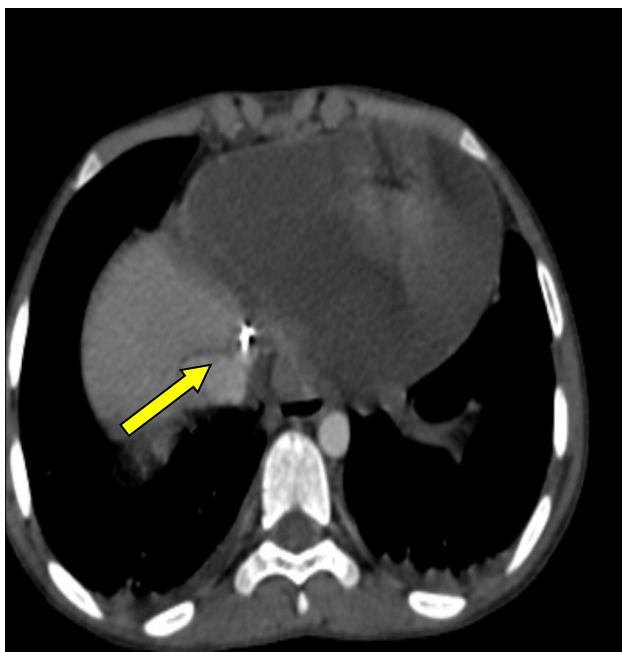


Figure 2: CT abdomen guide wire inside sheath at the junction of hepatic vein and inferior vena cava.

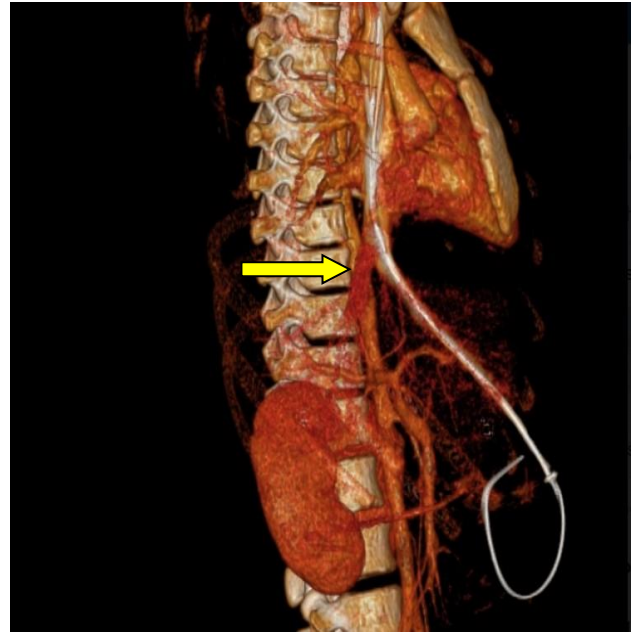


Figure 3: Guide wire inside sheath showing the course on 3D CT reconstruction.

DISCUSSION

Major complications during pericardiocentesis include vascular injury like a coronary artery, coronary vein, pulmonary artery lacerations, cardiac chamber perforation and cardiac chamber pseudoaneurysm formation.⁵

Echocardiography guided pericardiocentesis is currently recommended method for evacuation of pericardial fluid.⁶ Echo guidance provides site of maximum pericardial collection, location of puncture site, and needle trajectory to avoid vital structure.⁷ Detailed echocardiographic examination is done to localise the site of maximum pericardial collection and pericardiocentesis is done by three approaches namely apical, parasternal and subxiphoid. Each approach has its own advantages and disadvantages however right atrial puncture is more common with subxiphoid approach.¹

In this case, patient was planned for echo guided pericardiocentesis but loading doses of drugs given for conscious sedation caused transient systemic hypotension aggravating the hemodynamic effect of tamponad. Blind pericardiocentesis was attempted through subxiphoid approach in view of hemodynamic instability. Agitated saline injected through sheath opacified right atrium and right ventricle giving an impression of right atrial perforation. Cardiac CT however confirmed the site of puncture at the junction of hepatic vein and inferior vena cava. Position of sheath in any vascular structure draining into heart will opacific heart on agitated saline injection and we emphasize the importance of cardiac imaging before planning therapeutic strategy for such complications during pericardiocentesis.

CONCLUSION

To the best of our knowledge, this is a rare of clinically inconsequential hepatic vein punctured during pericardiocentesis which mimicked right atrial perforation.

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Ethical approval: Not required

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