Non-traumatic parasternal pericardiocentesis

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DESCRIPTION

A breathless woman in her 30s was admitted with cardiac tamponade following resection of her left upper lung lobe with carcinoid tumour over 6 months prior. She had inflammatory polyarthropathy and incidental pulmonary embolism confirmed on CT pulmonary angiogram. This was treated with full anticoagulation with low-molecular-weight heparin. To perform her pericardiocentesis, three possible methods were considered; (1) subcostal approach had overlying liver and abdominal adiposity rendering this conventional access inadvisable, published series indicate an up to 20% complications rate which is also the most indirect route and in current practice it accounts for the bulk of adverse events[1 2]; (2) apical approach was hindered by breast, chest adiposity and overlying lung with the potential of causing pneumothorax and finally; (3) parasternal approach which is increasingly done in the emergency department by non-cardiologists and was favourable.[3] Her echocardiogram (figure 1A) revealed significant effusion around the heart with tamponade physiology on doppler and evidence of diastolic right ventricular collapse. The ultrasound probe was used to mark an ideal "X" spot 1 cm from the left sternal edge in the fourth intercostal space with the patient in supine posture, overlying the cardiac notch. This area is usually devoid of lung tissue, where the parietal pericardium abuts the chest wall and this measured 3 cm for this patient (figure 1B). Importantly, the left internal mammary artery which runs > 13 mm from the sternum could be avoided. A 21 gauge needle from the Cook Micropuncture Pedal Introducer Access Set (Cook Medical, Bloomington, USA) was used to enter the pericardial space; this needle has a length of 4 cm, which means that there is no risk of going too deep to penetrate any cardiac structures. Therefore removing the need for simultaneous ultrasound guidance during needling. Otherwise, using a bigger and longer 18 gauge x 15 cm standard needle, this would have to be advanced at an angulation under the ultrasound probe with the potential of puncturing the left internal mammary artery.[3 4] In this case, as the needle was inserted vertically, the first flush-back indicated entry into the pericardial space and a thin 0.018″ wire was placed as seen in the fluoroscopic

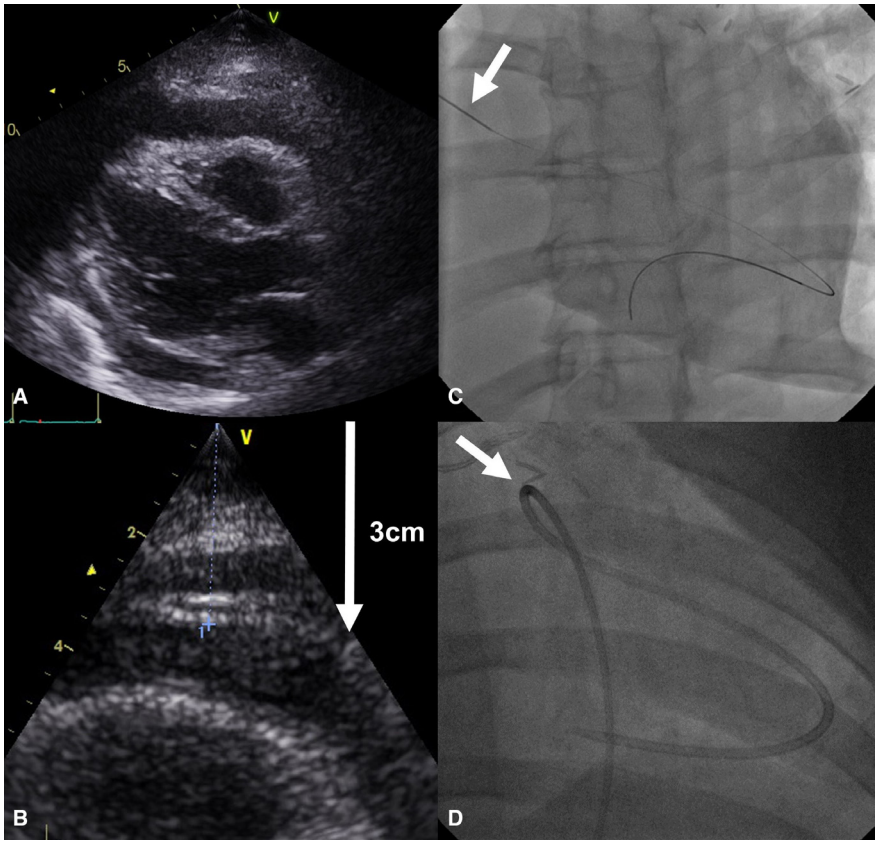

Figure 1 Large pericardial effusion on echocardiogram (A), distance between chest wall and parietal pericardium (B, arrow), small 21 gauge needle and thin 0.018″ wire in pericardial space (C) and pericardial drain in situ (D).

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Learning points

- Pericardial effusion causing cardiac tamponade is an increasingly common medical emergency. Recent general availability of echocardiogram in the accident and emergency department means that the sickest patients with it are being diagnosed requiring on-the-spot pericardiocentesis.
- There are three common approaches to pericardiocentesis: subcostal, apical and parasternal. The first approach though conventional and standard practice is the least direct and is associated with the most complications.
- Applying a slender technique to the parasternal approach to pericardiocentesis potentially makes the procedure simple, safe and predictable.

picture in left anterior oblique (LAO) view (figure 1C). Utilising the Seldinger Method, a 4 French cannula (diameter 1.33 mm × length 7 cm) which came in the pack was put into the pericardial space for pressure measurements. The mean pericardial pressure was 17 (< 4) mm Hg, confirming cardiac tamponade. Finally, a 0.035″ wire from the PERIVAC Pericardiocentesis Kit (Boston Scientific, Massachusetts, USA) was introduced via the cannula and an 8.3 French drain provided was positioned with ease along the upper border of the rib thus avoiding the neurovascular bundle, as seen in the lower fluoroscopic picture in posterior anterior (PA) view (figure 1D). After 200 mL of blood-stained fluid was withdrawn, the pericardial pressure fell to a mean of 0 mmHg with immediate symptomatic relief. Slender techniques are generally non-traumatic.[5] This two-step technique was previously described elsewhere and it allows accessing the pericardial space at a first pass in a fully anticoagulated patient.[6] This additional step potentially renders the procedure as safe as a diagnostic pleural tap.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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