Migration of peripherally inserted central catheter likely into the azygos vein: a conservative management

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DESCRIPTION

A 31-year-old female patient with systolic heart failure (ejection fraction of 30%) and automatic implantable cardioverter-defibrillator (AICD) was admitted to the hospital with sepsis from *Staphylococcus hominis* and *Staphylococcus capitis* bacteraemia. A transesophageal echocardiogram showed AICD lead vegetation. Subsequently, the AICD was replaced. A peripherally inserted central

catheter (PICC) was placed through the left basilic vein due to difficult intravenous access. Initially, fluoroscopy (figure 1) and chest X-ray (figure 2) confirmed appropriate position of the catheter tip in the superior vena cava (SVC). A day after placement, the PICC line stopped functioning. A repeat chest X-ray (figure 3) at this time revealed the catheter tip going likely dorsally over the right main stem bronchus. The official radiology report stated that the PICC line is in azygos vein (AV). We discussed these findings with two different expert radiologists at our university hospital and concluded that PICC tip was likely in the AV and kinked. We forcefully flushed the line for 10 s with

Figure 1 Fluoroscopy imaging confirming the appropriate position of the guidewire in superior vena cava before the insertion of catheter.

Figure 2 Portable anteroposterior view of chest X-ray confirming the appropriate position of peripherally inserted central catheter tip in superior vena cava after initial placement.

Figure 3 Portable anteroposterior view of chest X-ray showing peripherally inserted central catheter tip over the right mainstem bronchus migrated likely into the azygos vein.

Figure 4 Portable anteroposterior view of chest X-ray showing repositioning of peripherally inserted central catheter tip from the azygos vein into superior vena cava after a saline flush.

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saline, after which the tip repositioned itself from the AV into SVC. Following this, PICC line was fully functional. Repeat chest X-ray confirmed that the PICC line tip had returned to SVC (figure 4).

Anatomically, AV drains abdominal and thoracic walls. It ascends in posterior mediastinum, arches ventrally over the right main stem bronchus to enter the posterior aspect of SVC.¹ Optimal position of central line tip is at the distal third of SVC.² Central line migration into the AV is a very rare complica-

tion.³ This can cause various complications like malfunction of the catheter, perforation, thrombosis, haemorrhage, infection and stenosis of AV.^{2 4}

Risk factors known to cause migration are a left-sided approach to catheter insertion and increased right atrial pressures causing AV dilation.^{1 2} This is usually resolved by retraction of the catheter and repositioning, followed by a confirmatory chest X-ray. We propose that forceful flushing of the catheter in our case caused the tip to snap back into normal position, as an opposite reaction to the jet of normal saline outflow from catheter tip.

Contributors GT identified the condition and prepared the manuscript. SO-E was involved in literature search and manuscript preparation. PT was involved in drafting and revising the article. SP was involved in editing manuscript and final revision.

Competing interests None declared.

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Learning points

- ▶ A chest X-ray may be the first test of choice to confirm the position of a peripherally inserted central catheter (PICC) line in the case of malfunction.
- ▶ A trial of forceful saline flush may be an initial intervention of choice to correct the position of PICC lines kinked at the junction of the superior vena cava and azygos vein before proceeding with dressing removal and retraction of the catheter. This can avoid the risk of complications such as bleeding and infection.
- ▶ A right-sided approach might prevent migration of PICC in high-risk patients like increased right atrial pressure.

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