CASE REPORT

Pulmonary artery catheter coiled in the main pulmonary artery trunk

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SUMMARY

Pulmonary artery (PA) catheterisation has been performed for over four decades. It is utilised in intensive care units and perioperatively to titrate fluid and pressor therapy. Major and minor complications have been reported. The catheter can infrequently loop and coil in the right atrium, right ventricle and superior vena cava. We report a case of coiling of the PA catheter in the main PA. A 33-year-old woman was admitted with multiorgan failure and shock. She required mechanical ventilation, was in severe pulmonary oedema and required vasopressors for shock. We placed a PA catheter to assist in the management of her haemodynamic collapse. The catheter coiled in the main pulmonary trunk, which is extremely rare. The catheter was removed without any complications.

BACKGROUND

Pulmonary artery (PA) catheters are placed to help guide therapy for patients with haemodynamic compromise. During their insertion, the catheter may sometimes form a loop in the right heart.^{1–6} We present a case where the PA catheter coiled in the main pulmonary trunk during insertion.

CASE PRESENTATION

A 33-year-old woman with a history of an atrioseptal defect (ASD) repaired at age 26, systemic lupus erythematosus on chronic steroids, presented with renal insufficiency and respiratory distress. The patient required intubation, mechanical ventilatory support and haemodynamic support with vasopressors. Fluid therapy was limited because of the presence of pulmonary oedema. We placed a PA catheter to assess the haemodynamics and guide fluid and

vasopressor therapy. During placement, a right ventricle (RV) waveform was obtained at 24 cm and PA tracing obtained at 40 cm. Despite multiple attempts, we were unable to obtain a PA occlusion pressure (PAOP) waveform even with advancing the catheter up to 65 cm, and therefore did not attempt to obtain a cardiac output determination. Chest X-ray revealed coiling of the PA catheter within the main pulmonary trunk (figures 1 and 2). The catheter was successfully removed without any obstruction or kink developing.

DISCUSSION

The PA catheter⁷ has been widely used in intensive care units and perioperatively since its introduction in 1970.^{8–9} Intensivists, cardiologists, surgeons and anaesthesiologists place and interpret the data obtained from these catheters. Major and minor complications have been reported.^{10–11} The incidence of a looped catheter is fairly low, ranging from 0.2% to 2.5%.^{5–10} The most frequent sites of coiling or looping of the PA catheter are in the right atrium, RV, and superior vena cava.^{1–6} Rarely, such a loop can be formed in main pulmonary trunk, as seen in our case. We obtained a PA waveform at 40 cm, which is the usual location. Despite multiple attempts at advancing the catheter up to 65 cm we were unable to obtain a PAOP waveform. We hypothesised that the failure of the catheter to advance to a normal PAOP position was because of the extreme pulmonary vasodilatation caused by chronic left to right shunting caused by the patient's ASD with resulting coiling in the main PA.

Figure 1 Pulmonary artery (PA) catheter coiling in PA.

Figure 2 Dilated pulmonary artery.

To cite: Aggarwal N, Kupfer Y, Yoon TS, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-200049

A PA catheter malposition yields an erroneously high cardiac output because of an alteration in the distance between the thermofilament and the thermostat which causes less thorough mixing of blood and an alteration in the variation of temperatures over the sampling period used during the calculation.¹² Removal of a coiled catheter is more difficult because the catheter may kink and become obstructed in the artery and may require surgical or interventional radiology removal.^{1 2 4}

Learning points

- ▶ Pulmonary artery (PA) catheters rarely may coil in the main PA trunk especially when the trunk is markedly enlarged.
- ▶ Failure to obtain a PA occlusion pressure waveform after a PA catheter waveform was obtained should alert the clinician to the possibility of coiling in the main PA.
- ▶ Coiled catheters should be removed carefully because the catheter may become kinked and obstructed in the vessel requiring surgical or interventional radiology removal.
- ▶ Cardiac output obtained by a catheter coiled in the main pulmonary trunk may be erroneously high.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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