Abstract:

Rationale: Because central venous catheters (CVCs) are placed at the great vessels, mechanical complications can be fatal. Using the landmark method alone can make CVC difficult to access, depending on the skill of the operator and various patient conditions, such as anatomical variations of the vessels, young age, hypovolemic state, obesity, and short neck. Therefore, ultrasound (US)-guided techniques, including visualization of the vein and needle in the lumen of the vessel, are recommended. Nevertheless, our experience demonstrated that CVC malposition or vascular penetration cannot be prevented completely, even with real-time US guidance.

Patient concerns: The first patient was a 19-year-old woman (weight = 58 kg, height = 155 cm) who underwent CVC cannulation in the right internal jugular vein (IJV) under general anesthesia using real-time US. The second patient, a 50-year-old woman (weight = 51.6 kg, height = 155.7 cm), underwent CVC insertion in the right IJV using real-time US.

Diagnoses: During guidewire insertion in the first case, the posterior wall of IJV was penetrated, and a break in the core body of the guidewire was detected. In the case of second patient, CVC was embedded in the posterior wall of IJV and misplaced in the interpleural space in the right thorax. In both cases, an out-of-plane US approach was used.

Interventions: In the first case, the broken guidewire was completely removed with real-time US guidance. In the second case, all fluid injected through CVC was aspirated, and then CVC was removed.

Outcomes: In both cases, surgeries were completed successfully and all the patients were discharged without any complications.

Lessons: Even if the needle tip is located in the lumen of IJV and blood aspiration is confirmed on real-time US, vascular penetration or CVC malposition during the procedure cannot be completely prevented because of the limitation of the US imaging field. These results suggest that care must be exercised even during US-guided CVC placement and that alternative US-guided techniques or supplementary monitoring should be considered to confirm proper CVC position.

Reference:

Lee JE, Kim MJ, Kwak KH. Posterior wall penetration of the internal jugular vein during central venous catheter insertion using real-time ultrasound: Two case reports. Medicine
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