
Abstract:

Objective. Accidental arterial cannulation during ultrasound-guided central venous cannulation is rarely reported and should be much less likely with dynamic guidance. Although accidental arterial penetration with the needle may occur periodically without notice and with little harm, actual arterial dilation and line placement may result in serious complications.

Methods. This series reports 6 such cases of accidental arterial cannulation and central line insertion under dynamic ultrasound guidance.

Results. Two of the arterial cannulations resulted in airway loss, with 1 of these ending in death. The remaining 4 arterial lines led to serious local complications. Ultrasound video analysis of each line placement or postplacement analysis was reviewed, and common pitfalls were extracted. In 3 cases, a central line went directly through the internal jugular vein (IJ) and into the carotid artery. In 1 case, a cordis introducer sheath traveled through the posterior wall of the common femoral vein and into the deep femoral artery branch below. Each patient was hypotensive and hypoxic, making traditional safety checkpoints such as aspiration of bright red blood and pulsatile flow from the syringe hub less reliable in
Accidental arterial cannulation. All ultrasound-guided cannulations were performed by a standard short-axis approach with high-resolution linear array ultrasound transducers on modern equipment.

Conclusions. The short-axis approach, as seen in this series, can provide a false sense of security to the practitioner and allows for potentially dangerous accidental arterial cannulation. In the setting of critically ill patients, it may be prudent to not only visualize the entire path of the needle with the long-axis approach but also confirm correct cannulation by tracing the guide wire in the long axis before line placement.