Confirmation of Central Line Placement Using Power Doppler

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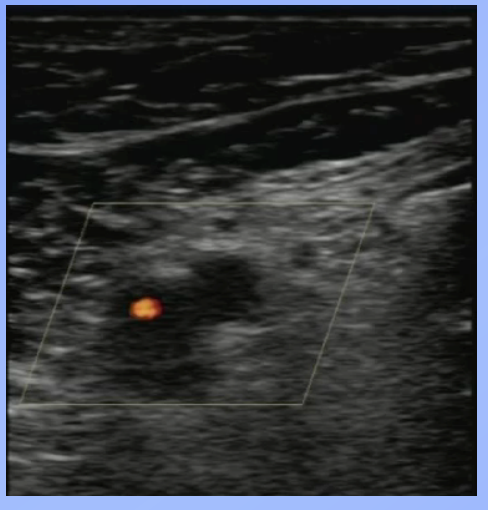
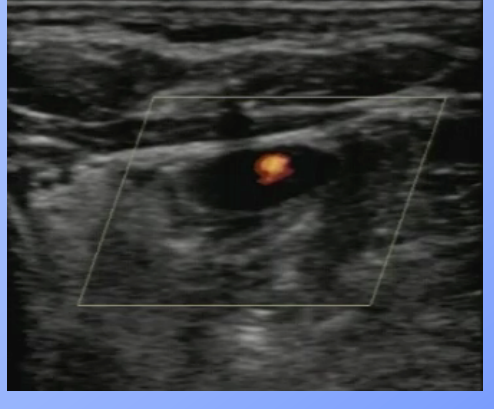
Objective: Verification of central lines within the appropriate vessel after placement is crucial for use. We encountered one episode of easy flushing through all three ports of a triple lumen catheter but were unable to easily aspirate blood through the ports. The cannula of the central line was not echogenic and therefore not easily visualized by two-dimensional (2D) ultrasound gray scale imaging. We describe a method which can verify the position of a non-echogenic catheter using power Doppler ultrasound.

Methods: A triple lumen central line was placed in the femoral vein using Seldinger technique. Venipuncture was attained under ultrasound guidance and the procedure was performed using sterile technique. Ultrasound was then used to verify the placement of the cannula within the vessel. A linear ultrasound probe was placed superior to the inguinal groove in a position transverse to the lumen of the catheter. The vein was confirmed on ultrasound using compression technique. Flushes of sterile saline were infused into the triple lumen catheter and visualized using power Doppler. Images were captured as still frames and video images.



Doppler flush technique in femoral vein



Doppler flush technique in internal jugular vein

Results: Upon performing the sterile saline flush under power Doppler, doppler signals were visible in a confined area within the vein consistent with signal in the cannula of the central line. No other Doppler signal was seen either intravascularly or extravascularly. The flushes were repeated multiple times with similar results on all occasions.

Conclusion: After placement of a central line, position of the catheter can be verified using Power Doppler. By instilling sterile saline flushes into the line, isolation of Doppler signal limited to the cannula of the catheter without any other intra or extravascular signal can reveal the location of the difficult to see non-echogenic catheter. As ultrasound becomes used more frequently for initial venipuncture for the central line, extension of ultrasound use for verification of placement is a logical next step. The technique is easy with reproducible results on our attempts.

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