

Retrograde Flow of Radial Arterial Line Flush Solution Captured with Ultrasound Imaging in a Neonate

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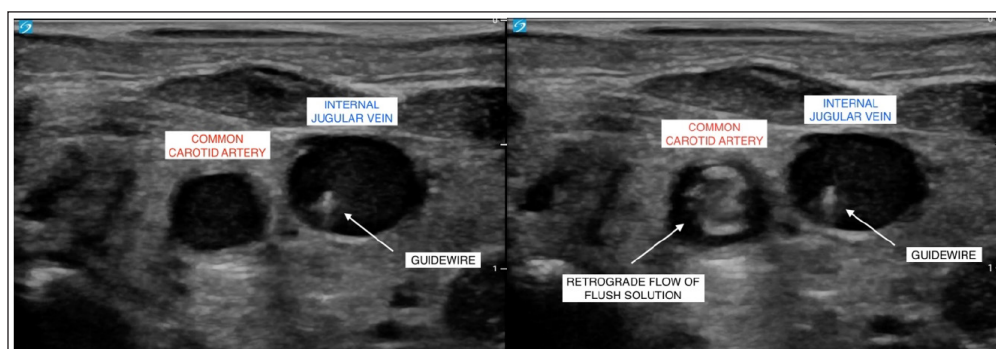
A 3.5kg, four-day-old, term infant with prenatal diagnosis of transposition of the great arteries (TGA) presented for arterial switch operation (ASO). Following induction of general anesthesia and nasotracheal intubation, a right radial arterial line and right internal jugular vein central line were placed using the Seldinger technique and ultrasound guidance. When guidewire position in the jugular vein was confirmed with ultrasound, turbulent flow was seen in the right common carotid artery. It was recognized this flow occurred during manual flush of the arterial line and represents retrograde flow in the arterial system. Video documentation of the event was obtained and still images are shown below.

Arterial line placement is performed routinely in cardiac surgical patients. The radial artery is frequently chosen for cannulation because of its accessibility and low incidence of complications in infants, children, and adults [1,2]. After aspiration of arterial blood, the line must be flushed to prevent thrombosis and maintain catheter patency. However, retrograde flow in arteries proximal to the site of catheter insertion has been clearly demonstrated in pediatric and adult patients during use of the pressurized flush system and during manual flush of the line.

In these studies, the rate of flush solution injection was directly related to the probability of retrograde flow. A rate of manual injection faster than 0.5-1mL/5s in neonates and 1mL/s in adults has been shown to embolize microbubbles and reverse arterial flow respectively [3,4].

References

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