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## Femoral arterial cannulation performed by residents: A comparison between ultrasound-guided and palpation technique in infants and children undergoing cardiac surgery

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**Background:** Percutaneous cannulation of the femoral artery in the pediatric age group can be technically challenging, especially when performed by residents in training.

**Objective:** We examined whether the use of real-time ultrasound guidance is superior to a palpation landmark technique for femoral artery catheterization in children undergoing heart surgery.

**Methods:** Patients were prospectively randomized into two groups. In the palpation group, the femoral artery was cannulated using the traditional landmark method of palpation of arterial pulse. In the ultrasound group, cannulation was guided by real-time scanning with an ultrasound probe. Ten minutes were set as time limit for the resident's trials during which the time taken for attempted cannulation (primary outcome), number of attempts, number of successful cannulations on first attempt, and success rate were compared between the two groups. Adverse events were monitored on postoperative days 1 and 3.

**Results:** A total of 106 patients were included in the study. The time taken for attempted femoral artery cannulation was shorter ( $301 \pm 234$  vs.  $420 \pm 248$  s; difference in mean: 119; 95% confidence interval (CI) of difference: 26-212;  $P=0.012$ ) and the number of attempts was lower [1 (1-10) vs. 2 (1-5); difference in median: 1, 95% CI of difference: 0.28-1.72;  $P=0.003$ ] in the ultrasound group compared with the palpation group. The number of successful cannulations on first attempt was higher in the ultrasound group compared with palpation group [24/53 (45%) vs. 13/53 (25%); odds ratio (OR): 2.54, 95% CI: 1.11-5.82;  $P=0.025$ ]. The number of patients who had successful cannulation was 31 of 55 (58%) in the palpation group and 40 of 53 (75%) in the ultrasound group (OR: 2.18, 95% CI: 0.95-5.01;  $P=0.06$ ). None of the patients had adverse events at days 1 and 3.

**Conclusion:** Ultrasound-guided femoral arterial cannulation in children when performed by anesthesia residents is superior to the palpation technique based on the reduction of the time taken for attempted cannulation and the number of attempts, and improvement in first attempt success.

### Biography

Kaddoum R N has joined AUBMC in 2011 as an Assistant Professor at the Department of Anesthesiology from St. Jude Children's Research Hospital in Memphis TN where he has worked from 2008 to 2011. He has conducted clinical research at St. Jude and his main interests were the management of chronic pain in children with cancer, pediatric regional anesthesia, and pediatric airway management in children with mediastinal masses. He is currently the Director of Pediatric Anesthesia and Director of the Operating Room at the American University of Beirut Medical Center. He has also been recently promoted to Associate Professor of Clinical Anesthesiology. His main focus at AUBMC is pediatric open-heart anesthesia.

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