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Abstract:

**Introduction:** The palpation technique is generally used for radial artery catheterisation, but is associated with a high rate of failure and complications. Dynamic needle tip positioning (DNTP) is a new ultrasound-guided technique. We aimed to compare the traditional palpation technique with DNTP performed by four anaesthesiology residents.

**Methods:** The study was a randomised, controlled, patient-blinded, crossover study. Forty patients underwent bilateral radial artery catheterisation using both techniques. The primary endpoint was the first attempt success rate. The secondary endpoints were: 1) number of skin perforations, 2) number of needle retractions, 3) needle manipulation time, 4) total time, 5) attempts lasting >180 seconds, 6) number of catheters used, 7) frequency of aborted attempts or crossovers, and 8) pain scores (VAS).

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**Results:** The first attempt success rate was significantly higher in the DNTP group compared with the palpation group (36/40 vs. 28/40,  $p = 0.022$ ).

The palpation technique group required a higher number of skin perforations (44 vs. 60,  $p = 0.016$ ), needle retractions ( $p = 0.001$ ) and catheters (42 vs. 52,  $p = 0.011$ ) compared with the DNTP group. Neither the total time required for arterial catheterisation, the needle manipulation time nor the VAS scores were significantly different between the groups (all  $p > 0.407$ ). Aborted attempts were only seen in the palpation group (7/40,  $p = 0.016$ ).



Conclusions: Ultrasound-guided arterial catheterisation using the DNTP technique is superior to the standard palpation technique. This study favours the ultrasound-guided DNTP technique as the first choice rather than merely being viewed as a rescue procedure.

Reference:

Gopalasingam, N., Hansen, M.A., Thorn, S., Sloth, E. and Juhl-Olsen, P. (2017) Ultrasound-guided radial artery catheterisation increases the success rate among anaesthesiology residents: a randomised study. *The Journal of Vascular Access*. June 6th. .

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