Background: Palpation and fluoroscopy are currently the ‘standard’ for transfemoral artery access (TFA). However, it can be challenging in patients with large thigh circumference. Previous small-scale studies have suggested that the use of ultrasound (US)-guidance in patients with thigh circumference greater than 60 cm may reduce puncture attempts required for successful catheterisation. The aim of this analysis was to assess the effect of US-guided femoral access in patients with thigh circumference ≥ 60 cm.

Methods: As part of the SURF trial, we randomised 1388 patients undergoing coronary angiography into radial or femoral access and standard or US-guidance in a 2 × 2 factorial design. Of these, 392 patients underwent TFA with a recorded thigh circumference measurement. Thigh circumference was measured at the level of the medial inguinal crease due to difficulty of measuring at the femoral puncture site. Sonosite S-Cath Ultrasound machine was used with a 6cm depth and a 6-13MHz Linear Array Transducer.

Results: 423 patients had thigh circumference ≥ 60 cm while 169 patients were ≥ 60 cm. In patients with thigh circumference ≥ 60 cm, US significantly reduced venipuncture (3.05% vs. 20.1%, *p* = 0.031) and access attempts (1.23 ± 0.53 vs. 2.02 ± 1.42, *p* < 0.001) and, improved first-pass success (82.1% vs 48.8%, *p* < 0.001). There was no significant difference in vascular complications or bleeding events.

Conclusion: US was shown to significantly improve access outcomes in patients with larger thigh circumferences. This suggests that it would be useful on a routine basis for TFA.

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