72-year-old male with a history of hypertension complained of a painful pulsatile mass and extensive bruit in the left groin one week after coronary angioplasty and stent placement. Colour Doppler Imaging (Acuson, Sequoia 512 Mountain View) showed a lobulated pseudoaneurysm with two cavities, the larger of which was 38 mm in diameter, arising just above the femoral bifurcation. The pseudoaneurysm was compressed under ultrasound guidance for 30 minutes, resulting in thrombosis of the greater cavity. However, swirling colour flow remained in the 26.8 mm smaller locule (Figure 1), together with a typical to-and-fro flow signal in a track leading from the femoral artery to the locule (pseudoaneurysm neck) (Figure 2).

While anticoagulation was continued, ultrasound-guided injection of thrombin was decided upon and informed consent was obtained from the patient. The thrombin was obtained from a commercial kit for the local management of bleeding from vascular access sites (D-stat, Vascular Solutions, Minneapolis, USA) and was diluted in physiological serum with calcium chloride (1 ml = 1000 U). The affected groin was cleaned with povidone-iodine and covered with a sterile drape. Using a freehand technique, a sterilized linear 7.5 MHz array transducer was used to guide a 20-gauge, echogenic needle with side delivery port percutaneously to the middle of the pseudoaneurysm, away from the neck. Slow injection (0.1 ml/s) of 0.5 ml of the thrombin was performed under continuous sonographic guidance (Figure 3). After the first injection, colour Doppler confirmed partial thrombosis of the pseudoaneurysm (Figure 4) and an additional injection of 0.5 ml without needle repositioning was needed in order to achieve complete thrombosis of the cavity (Figure 5). Once the pseudoaneurysm was thrombosed the needle was withdrawn and the presence of normal flow in the superficial and deep femoral artery was confirmed by colour Doppler ultrasound. The patient was restricted to bed rest for 4 hours and a repeat ultrasound examination 24 hours later showed no evidence of recurrent flow inside the pseudoaneurysm.

Ultrasound-guided percutaneous thrombin injection is a safe and efficacious first-line method of treating post-catheterisation pseudoaneurysms with a distinct neck, demonstrating an overall thrombosis rate of 93-100%. In the majority of patients a thrombin dose of 500-1000 U is adequate. The procedure can be performed in any relatively clean room with standard ultrasound.
equipment and needles. Anticoagulation does not seem to affect the efficacy of the procedure. Most interventionalists favour the use of human thrombin since bovine thrombin has the potential to induce allergic reactions.

After this encouraging initial experience we intend to use this method in our institute as initial treatment, instead of the traditional ultrasound-guided compression, because of its advantages in saving time for the operator and avoiding discomfort for the patient.

References