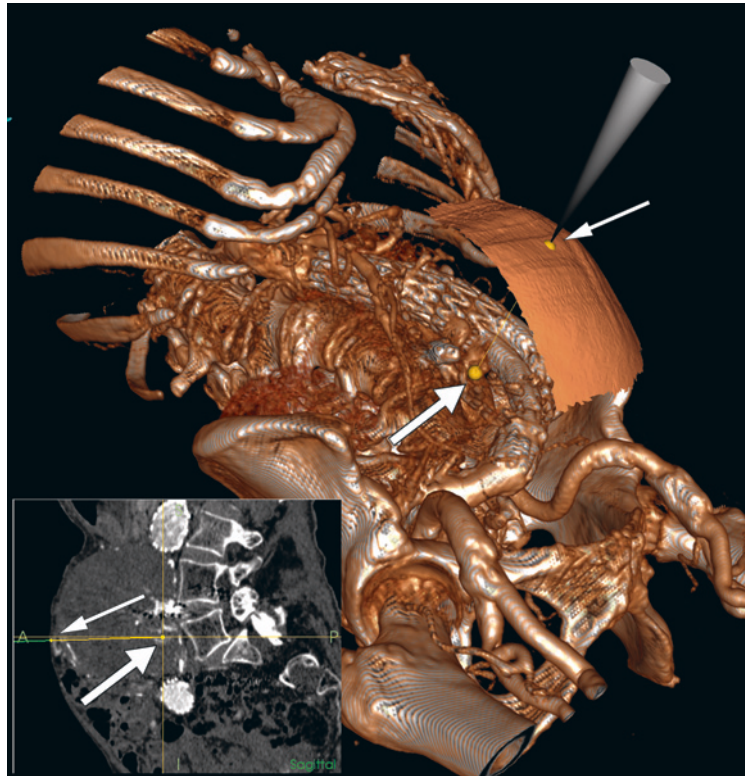


Leak after aortic stent-graft repair



In a female patient given a stent-graft repair to treat an abdominal aortic aneurysm, a retrograde blood flow arose via collateral vessels through two lumbar arteries and in between the aortic wall and the stent graft. CT scans showed the aneurysm enlarging, with constant risk of rupture. Attempts at endovascular embolisation of the blood vessels, which normally supply the network of collateral vessels, were unsuccessful. An attempt was therefore made to embolise the vessels directly using a microcatheter through a percutaneously inserted needle with the needle point close to the lumbar arteries. The needle placement is normally CT-guided, but that involves transferring the patient to an angiography suite where the actual embolisation is performed, and it is not possible to reposition the needle.

The Norwegian National Competence Centre for Ultrasound and Image-Guided Therapy has developed a navigation system (1) that continuously shows the position of different instruments in a three-dimensional image. In an angiography suite with integral 3D imaging equipment it was possible using this navigation system to perform percutaneous embolisation without having to move the patient. The large image is a 3D image of the patient with the needle point placement

on the surface of the skin (thin arrow) and directed towards one of the lumbar arteries (thick arrow). This method permits the needle to be placed to optimum effect and its position monitored throughout the procedure with the possibility for *multiple* insertions based on the same CT-image acquisition. The small image is that of the same setup in the sagittal plane. The microcatheter was introduced via the needle, and the lumbar arteries embolised with Onyx injections. A check-up eighteen months later showed no leak and the size of the aneurysm was unchanged. The method is experimental and is part of an ongoing research project.

The patient has consented to the publication of this article.

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References

1. Manstad-Hulaas F, Tangen GA, Dahl T et al. Three-dimensional electromagnetic navigation vs. fluoroscopy for endovascular aneurysm repair: a prospective feasibility study in patients. *J Endovasc Ther* 2012; 19: 70–8.

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