Three-Dimensional Images of Extra-Anatomic Arterial Bypass Graft Using Multidetector Row Spiral Computed Tomography Data With Volume Rendering

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A 71-year-old patient was referred to our department for postoperative evaluation of an extra-anatomic aortobifemoral bypass graft (Dacron) from the distal thoracic aorta to both common femoral arteries. Eight days earlier, the patient had undergone surgical resection of an anastomotic aneurysm with interposition of a short new graft segment at the right distal anastomosis of the bypass graft. The extra-anatomic aortobifemoral bypass had been implanted 9 years previously due to a severe infection of an infrarenal aortic bifurcation prosthesis. At that time, the infected prosthesis was removed, with subsequent ligation of the infrarenal abdominal aorta.

Multidetector row spiral computed tomography (MDCT) angiography (Somatom Volume Zoom, Siemens AG) was performed after the administration of 120 mL of iodixanol (Visipaque 300, Nycomed Amersham Imaging AS) at a flow rate of 3 mL/s using a power injector. The entire anatomic area from the supraaortic vessels down to the femoral arteries was scanned within 1 breathhold by using a collimation of 2.5 mm and a table feed of 25 mm/s. Images were reconstructed with a slice width of 3 mm and a reconstruction interval of 2 mm. Three-dimensional volume-rendering images of the MDCT data sets were performed (Figures 1 and 2 and Online Figure I).

MDCT angiography allowed evaluation of the entire extra-anatomic aortobifemoral bypass graft. Proximal and distal graft anastomosis could be evaluated in detail. The presence of vascular clips used for vessel ligation did not alter image quality.

Retrograde filling of contrast material into the left internal and right external artery was visible. Otherwise, no abnormal finding of the extra-anatomic bypass graft was detected on MDCT angiography. The patient was discharged on the eighth postoperative day.
Figure 1. Color-enhanced, 3D volume-rendering images using multidetector row spiral CT data set. A, Anterior view; B, Posterolateral view. The aortobifemoral bypass graft from the thoracic aorta (black arrowhead) to the right and left common femoral artery (thin white arrows) can be demonstrated. The distal graft anastomosis can be appreciated in good anatomic detail, despite the presence of surgical clips. In addition, an interposed short new graft segment is also visible (thick white arrows). Note retrograde filling of contrast material into the left internal and left external iliac artery (white arrowheads) and complete ligation of infrarenal abdominal aorta.

Figure 2. Targeted, color-enhanced, 3D volume-rendering reconstruction of the distal arterial bypass graft confirms the normal appearance of the distal anastomoses (thin white arrows). Note postoperative clip material (white arrowheads) and additional interposed short new graft segment (thick white arrow).
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