SHORT REPORT

Autologous Fashioned Graft for Aneurysm Repair in a Contaminated Field

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Background. In situ synthetic grafts are not routinely used for aortoiliac reconstruction in the presence of active or potential infection, while the use of a venous autologous graft in these circumstances is limited by the size and length of the venous conduit that is required, the superficial femoral vein being most frequently used.

Methods. We describe a new technique in which an autologous venous conduit was constructed with side-to-side anastomosed segments of a longitudinally opened greater saphenous vein. Thus the diameter of the new conduit was increased.

Results. This venous graft was successfully used to repair an isolated common iliac aneurysm in a patient with sigmoid cancer, as part of a combined procedure. At 1 year follow-up the venous graft has not shown any signs of dilatation or stenosis on CT scanning.

Conclusions. If validated by further work, our novel graft could be used in cases of intraabdominal graft infections and mycotic aneurysms instead of deep leg veins.

Keywords: Iliac aneurysm; Venous graft; Colon resection.

Objective

The presence of gross infection or co-existing infectious abdominal pathology usually precludes the use of synthetic grafts as arterial conduits. Similarly, the simultaneous performance of aortic aneurysm repair and clean-contaminated operations, although strongly advocated,1,2 has not been generally accepted.3

To avoid graft infection, autologous tissue reconstruction has been proposed,4 mostly with the superficial femoral vein,5–8 because its diameter is closer to the diameter of the aortoiliac system. Superficial veins have been used, but these have a tendency to occlude.5,7 Reconstructed superficial venous segments (spiral grafts) have been used in cardiothoracic surgery,9 but their use in vascular surgery is limited.10,11 We describe a new technique that uses autologous material and was successfully used for aneurysm repair in a potentially contaminated field.

Technique

The greater saphenous vein (GSV) is mapped in the thigh with ultrasound and its diameter measured. Aneurysm length is measured with spiral CT. The GSV is harvested simultaneously with the aneurysm dissection. An autologous conduit is fashioned as follows: The vein is opened longitudinally and divided into 2 or 3 segments of approximately equal length with the length of the aneurysm that needs to be repaired. These segments are anastomosed side-by-side using a continuous 6-0 polypropylene (Surgipro™, US Surgical Co, Norwalk, CT, USA) suture line (Fig. 1). The diameter of this venous conduit is equal to the sum of the diameters of the venous segments that were used and therefore the number of segments that needs to be anastomosed side-by-side depends on the diameter of the neck of the aneurysm and the diameter of the GSV.
Aneurysm repair is subsequently performed with the conventional inlay technique.

Case Report

A 74 year-old male with rectal adenocarcinoma had a staging CT scan. The tumour was located 5 cm above the anal verge and there was no evidence of spread outside the pelvis. CT scan showed bilateral common iliac aneurysms measuring 3.5 cm on the left and 2.5 cm on the right side (Fig. 2). Anterior resection of the rectum was performed, deferring anastomosis until the left iliac aneurysm was repaired. The bowel anastomosis was later covered by a defunctioning colostomy. The GSV in the thigh had a diameter of 6 mm on Duplex ultrasound. The length of the aneurysm was measured intraoperatively and a segment of the GSV twice the length of the aneurysm was harvested from the thigh. This was cut in two halves and a venous conduit was constructed with side-to-side anastomosis of the segments of the longitudinally opened GSV (Fig. 1). The aneurysm was repaired using this venous conduit with the inlay technique. A 3 cm segment of the GSV was used to revascularise the internal iliac artery and was anastomosed end-to-side proximally on the venous conduit and end-to-end distally at the orifice of the internal iliac artery.

Postoperative course was uneventful and at 1-year follow-up, the patient is asymptomatic with all peripheral pulses palpable, while on CT scan there is no tumour recurrence and the venous graft has not shown any signs of dilatation.

Discussion

This is the first reported case of an aneurysm repair using reconstructed GSV. We believe that the risk of infection in a potentially contaminated field is significantly less using an autologous graft than a synthetic one. An increased morbidity and mortality with the addition of nonvascular procedures to aortoiliac reconstruction has been reported, suggesting that the benefits and risks of combining vascular and nonvascular operations must be carefully weighed. Under these circumstances an infection-resistant autologous graft would be extremely valuable.

Since our technique consists of longitudinal cut of the vein followed by side-to-side suturing, final graft diameter is the sum of the diameter of the vein grafts used.

The durability of our novel graft will be tested during long-term follow-up. Previous experience in using spiral vein grafts or GSV segments as arterial substitute is limited, with no aneurysmal dilatation reported so far.

A potential limitation of our technique is the graft length. That depends on the quality and diameter of the GSV. Our technique could be applied in cases of intraabdominal graft infections and mycotic aneurysms; this will shorten the length of the operation and may decrease overall and leg associated morbidity due to deep vein harvesting.

References


Accepted 1 December 2004
Available online 5 January 2005