Percutaneous common iliac artery aneurysm repair – a case report

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D Mukherjee, M Bowen. Percutaneous common iliac artery aneurysm repair – a case report. *Int J Angiol* 2009;18(1):37-39.

Endovascular repair of common iliac artery aneurysms has become the preferred form of treatment, provided the appropriate anatomy for endovascular repair exists. The Zenith abdominal aortic aneurysm

graft converter (Cook Medical Inc, USA), by virtue of its design, appears to be the ideal device for such a repair. A case to illustrate the same is presented.

Key Words: Aneurysm; Artery; Common iliac; Endovascular; Percutaneous; Repair

Aneurysms of the common iliac artery represent 2% to 7% of all aortoiliac artery aneurysms. Repair of aneurysms exceeding 3.0 cm to 3.5 cm in diameter is recommended to prevent the risk of rupture. Rupture of common iliac artery aneurysms is associated with a risk of mortality approaching 70% (1-3).

Endovascular repair of aortoiliac aneurysms is commonplace; however, the repair of isolated common iliac artery aneurysms requires appropriate anatomy to achieve a stable repair. Preserving the internal iliac arteries is possible only for aneurysmal involvement of the proximal common iliac artery with an adequate distal landing zone available proximal to the origin of the internal iliac artery. Good results from endovascular repair of common iliac artery aneurysms have been reported (4-7).

We describe the repair of a common iliac artery aneurysm with challenging anatomy, where a seal could only be achieved in the external iliac artery using the unique design of a Zenith abdominal aortic aneurysm graft converter (Cook Medical Inc, USA) to transition from the generous common iliac artery to a 9.0 mm external iliac artery.

METHODS

A 75-year-old man with numerous risk factors for atherosclerosis and previous open repair of an abdominal aortic aneurysm with a tube graft presented for follow-up. The right common iliac artery was noted to have progressively increased in size to 3.5 cm at the greatest aneurysmal diameter (Figure 1), and the patient elected to undergo endovascular repair.

The length of the right common iliac artery aneurysm was 85.0 mm, involving the mid and distal common iliac artery. The internal iliac artery arose from the posterior and medial aspects of the aneurysm requiring exclusion, with distal seal possible only in the external iliac artery. The proximal common iliac artery was normal over a length of 2.5 cm and measured 14 mm in diameter.

Arterial access was established by way of the right common femoral artery. Two French ProGlide devices (Abbott Laboratories, USA) for preclosing the access were used to place sutures in the common femoral artery and left loose until the end of the procedure. An 8 Fr sheath was placed over the wire

in the right common femoral artery. The patient was anticoagulated. A Lunderquist wire (Cook Medical Inc, USA) was advanced through the aortoiliac system to straighten the tortuous common iliac artery. A buddy wire was placed alongside the Lunderquist wire, over which a marker catheter was advanced into the distal aorta, and digital subtraction angiography using the OEC 9800 C-arm (GE Healthcare, United Kingdom) was performed (Figure 2).

Repair was performed by placing a 20 mm × 55 mm Zenith iliac extender limb from the aortic bifurcation into the common iliac artery aneurysm. Next, a 24 mm × 55 mm Zenith iliac extender limb was placed with a 1.5 stent overlap into the first stent, and, within this, a 24 mm × 12 mm × 80 mm abdominal aortic aneurysm graft converter was placed in the tapered stent of the graft converter, transitioning from the common iliac artery into the external iliac artery. The proximal and distal landing sites as well as the junctions were balloon expanded using a 32 mm Coda balloon catheter (Cook Medical Inc, USA).

RESULTS

A final angiogram after completion demonstrated total exclusion of the common iliac artery aneurysm with no attachment or retrograde endoleak from the internal iliac artery.

The ProGlide sutures were cinched down to close the arterial access without problems. The anticoagulation was reversed, and palpable distal pulses were noted in the extremity on completion of the procedure.

During follow-up ultrasound examination, the common iliac artery aneurysm was shown to have been totally excluded, suggesting a successful repair.

DISCUSSION

Endovascular aneurysm repair has become the preferred method for treatment of aneurysms of aorta and iliac arteries when the anatomy is favourable for such a repair. Patient and surgeon preferences also favour endovascular repair, even when the anatomy is less favourable but not impossible, to achieve durable results.

Endovascular repair of isolated common iliac artery aneurysms has been well described in the literature using iliac limbs,

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Figure 1) Noncontrast computed tomography scan showing the presence of a 3.5 cm right common iliac artery aneurysm

Figure 2) Intraoperative angiogram showing the right common iliac artery aneurysm and internal iliac artery arising from the aneurysm

with the repair isolated to the common iliac artery and extending into the external iliac artery, when a distal landing zone is inadequate in the common iliac artery (8-10).

Use of the abdominal aortic aneurysm graft converter for common iliac artery aneurysm repair has also been previously described (11); however, many differences between the above-described repair and the previously reported use of this device are noted.

Percutaneous single femoral artery access and placement of the graft converter within a 24 mm × 55 mm Zenith iliac extender limb were unique to the present case.

The design of the abdominal aortic aneurysm graft converter incorporates a tapered stent as the second of a total of

Figure 3) Zenith iliac extender limbs with abdominal aortic aneurysm converter device (Cook Medical Inc, USA), with distal fixation in the external iliac artery

four stents over the length of the device (12). The tapered stent is placed against the origin of the internal iliac artery, providing a seal and allowing the two 12 mm stents to extend into the external iliac artery to provide a generous distal endoseal in a normal vessel. The unique design of the tapered stent is likely to obviate the need for previous embolization of the internal iliac artery (Figure 3).

Embolization of the internal iliac artery can be associated with a number of complications including buttock claudication and impotence, particularly if embolization coils are used and if thrombosis of the internal iliac artery branches is induced (13,14). Use of the abdominal aortic aneurysm graft converter with the tapered second stent of the device placed snugly against the origin of the internal iliac artery is probably no different than placing an occluder or coils in the main trunk of the internal iliac artery and not incurring the risks of internal iliac artery embolization.

The downside of this technique is the increased complexity of trying to seal a type II endoleak from the internal iliac artery when direct access to this artery is no longer available.

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