SHORT REPORT

Endovascular Stent-graft Repair for Infrarenal Aortic Pseudoaneurysm Caused by Penetrating Atherosclerotic Ulcer: Report of Two Cases

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Penetrating atherosclerotic ulcer (PAU) of the infrarenal aorta is rare and occurs when an atherosclerotic plaque ulcerates through the intima. PAU can be complicated by the development of intramural hematoma, adventitial pseudoaneurysm, and rupture. We report two cases that were treated by endovascular stent-graft placement and discuss the literature.

Keywords: Penetrating atherosclerotic ulcer; Infrarenal aorta; Pseudoaneurysm; Rupture; Endovascular repair.

Case One

A 74-year old man was referred for the evaluation of an ultrasonography finding of an enlargement of the infrarenal aorta. The patient had persistent low back pain for the past 3-weeks. Abdominal examination was unremarkable. All peripheral pulses were full and intact. The patient was afebrile. Laboratory investigations showed a normal C-reactive protein (CRP). CT scan revealed a pseudoaneurysm below the renal arteries while the aorta was of normal caliber (Fig. 1a). Angiography confirmed the lesion 3 cm below the renal arteries (Fig. 1b). The patient underwent transfemoral placement of a 26×140×14 mm³ aortouniiliac Endofit stent graft (Endomed, Arizona, USA) under local anaesthesia. The patient had an uneventful postoperative course and was discharged on the second postoperative day. A CT scan 3 months after the procedure revealed an intact stent graft with no endoleak or migration (Fig. 1c). At last follow-up 6 months after the procedure the patient remained well and had neither signs of abdominal sepsis nor symptoms regarding the procedure. On CT scan stent graft was patent and there was no evidence of migration, twisting or dilation of the diseased aortic segment.

Case Two

A 70-year old man presented complaining for a 1-week history of persistent abdominal pain around the lower border of the umbilicus. His abdomen was soft, but mildly tender to the left of the umbilicus. A pulsating mass was palpable. CT scan revealed a pseudoaneurysm below the renal arteries (Fig. 2a). Angiography, showed that the pseudoaneurysm contained fresh thrombus (Fig. 2b). The aorta was of normal caliber. The patient underwent transfemoral placement of two exclucer tube grafts 3.5×23 mm² (W.L. Gore and Associates, Flagstaff, AZ, USA) under local anaesthesia. The patient had an uneventful postoperative course and was discharged on day 2. A CT scan 3 months after the procedure revealed intact stent grafts with no endoleak or migration (Fig. 2c). Six months after the procedure the patient remained well. The stent grafts were patent and there was no evidence of

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migration or twisting on CT scan. The affected aortic segment showed no signs of dilation.

**Discussion**

Penetrating atheromatous aortic ulcer (PAU) is defined as ulceration of an atheromatous plaque that penetrates through the elastic lamina. A PAU may be complicated by aortic intramural hematoma formation. The ulceration may extend along the media and in some cases can cause stretching of the weakened aortic adventitia, forming a pseudoaneurysm. Intramural hematoma and pseudoaneurysm associated with PAU may rupture. PAU is common in elderly individuals with arteriosclerotic disease such as angina pectoris.

PAU is rare in the ascending aorta and aortic arch, and common in the middle and distal segments of the descending thoracic aorta. There are few reports of PAU in the abdominal aorta. Rupture of a nonaneurysmal infrarenal aorta, as a result of PAU, is rare.

CT scan and MRI can be used for the diagnosis of PAU. Intramural hematoma, advential pseudoaneurysm, and rupture with extra-aortic hematoma may be seen. Angiographic confirmation of PAU establishes the diagnosis.

Early intervention is recommended in complicated PAU. A less invasive treatment for this entity, endovascular stent grafting was first used by Vasquez and co-workers. We believe endovascular stent-graft placement has a place in the treatment of PAU of the abdominal aorta, especially in elderly patients with comorbid conditions.

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Fig. 1. (a) Contrast enhanced abdominal CT scan showing a pseudoaneurysm below the renal arteries in addition to a heavily calcified intima and aortic wall. Note the focal rupture in the left-anterior surface of the infrarenal aorta, which is related to the break in the calcified aortic wall. This area is protruding left-anteriorly to form the pseudoaneurysm. (b) Angiography demonstrating the lesion below the renal arteries with very localized extravasation of contrast medium. (c) CT angiogram 3 months after the procedure demonstrating an intact stent-graft with no endoleak or migration.
References


Accepted 27 January 2005