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Vascular Diseases Quiz – Case 15

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A 82-year-old male patient was referred to our department due to a persistent type 2 endoleak with concomitant sac enlargement, discovered during regular follow-up abdominal ultrasound study five years after endovascular aortic aneurysm repair. At presentation, he complained of low back pain and clinical examination revealed a pulsatile abdominal mass. His past medical history included ex-smoking, arterial hypertension, coronary artery by-pass surgery and CORD. The initial repair took place 5 years ago and included endovascular repair of a 6.8 cm abdominal aortic aneurysm with the use of an endograft with suprarenal fixation. Upon follow-up, CT scan at 1 and 6 months post EVAR, the patient was diagnosed with a small type 2 endoleak, with stable maximum aortic diameter (fig. 1a, b). Thereafter, he followed on a close surveillance program with abdominal duplex ultrasound studies. Three years after EVAR, the patient developed sac enlargement and a new abdominal CT scan revealed a maximum abdominal aorta diameter of 7.4 cm, with signs of persistent endoleak. Initial approach included coil embolization through the iliolumbar artery with good early results; however, 14 months after embolization, the patient became symptomatic and an emergency CT scan documented a 8.6 cm abdominal aortic aneurysm (AAA) with signs of significant blood flow within the sac and no signs of rupture (fig. 2).

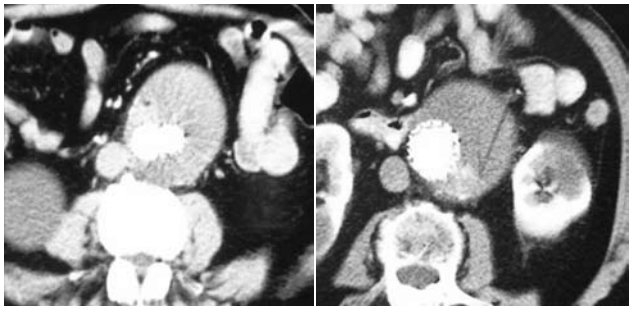

Figure 1. Follow-up CT revealing a persistent small type 2 endoleak (arrow) with stable aortic diameter (6.8 cm).

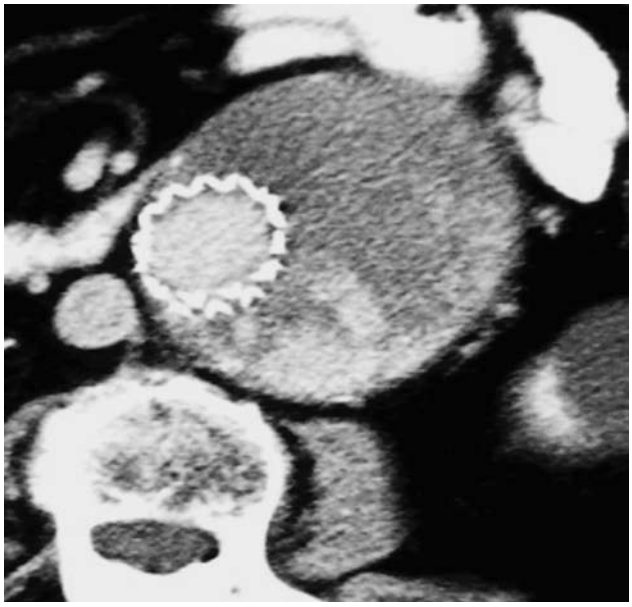

Figure 2. Fourteen months post embolization, a new significant endoleak appeared with recurrent sac enlargement (dmax: 8.6 cm) and no signs of rupture.

Quiz #1: Which is the optimum treatment strategy for this patient's condition?

Quiz #2: Is endograft removal necessary?

Comment

Endovascular aortic aneurysm repair, although it is a less invasive procedure for the treatment of patients with AAA, harbors the need for lifelong surveillance due to the risk of late complications, such as endoleaks and the possibility for reintervention. According to the EUROSTAR registry there is a 2.1% annual cumulative risk for conversion to open repair and a 1.2% risk for rupture at 3 years in patients with type 2 endoleaks after EVAR. Enlargement of the aortic sac remains a major factor for rupture in this subgroup of patients and an indication for reintervention. Management of patients with type 2 endoleaks is based upon the "wait and see" approach, by which the aneurysm diameter is closely followed up with imaging studies. In cases of persistent type 2 endoleak with concomitant sac enlargement, reintervention includes mainly endovascular therapy, by means of translumbar or coils embolization of the relevant

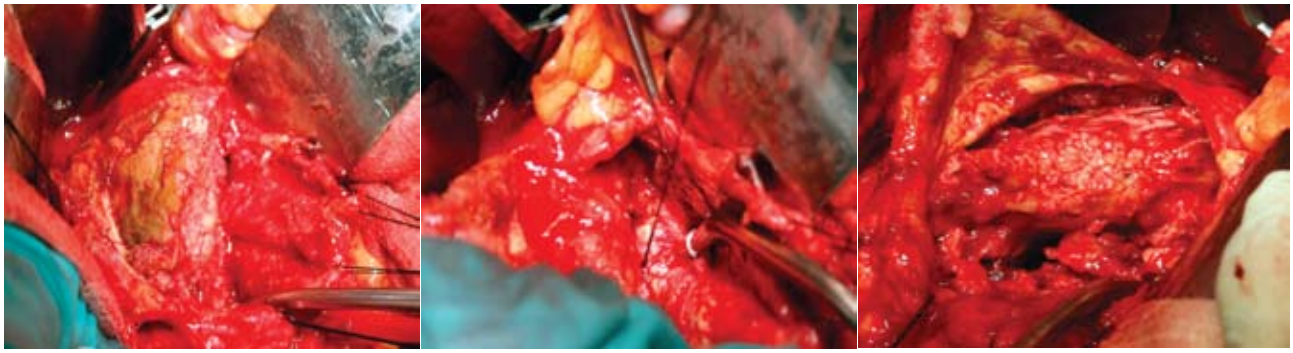

Figure 3. (a) Removal of intermural thrombus without cross-clamping; (b) lumbar artery ligation from within the sac; (c) endograft left *in situ*.

inflow vessel. Operative repair is preserved for patients in who endovascular approach has failed or is not possible, and includes laparoscopic ligation of the feeding vessels and conversion to open with or without endograft removal.

The patient discussed herein was scheduled for open repair after failure of our initial attempt to seal the endoleak by coil embolization. Due to patients' concomitant diseases, and the high risk for suprarenal cross-clamping, a modified approach to preserve the endograft was planned. Upon operation and after placement of an aortic clamp above the renal arteries, the sac was longitudinally opened but without cross clamping. After careful removal of the intramural thrombus, the site of the feeding vessel was spotted, as back bleeding from a lumbar artery. The artery was ligated from inside the sac, preserving the endograft in situ during the whole procedure (fig. 3). After hemostasis was obtained, the sac was tightly sawn over the endograft, and the wound was closed in the usual manner. Total operation time was 140 minutes, while total blood loss was 220 cc, without need for blood transfusion. The patient's postoperative course was unremarkable and he was discharged on the 5th postoperative day. An abdominal CT scan was obtained prior to discharge, as a new base for future follow-up. The patient remained well, with no signs of endoleak one year after operation (fig. 4).

Understanding of the hemodynamics and the natural history of type 2 endoleaks is essential in decision making of these patients. Removal of the endograft with revascularization of the lower extremities, by means of in situ or extra-anatomic bypass surgery, is linked with significant mortality in this group of high-risk patients. Ligation of the feeding vessels by maintaining the endograft and avoiding aortic cross-clamping is a safe and less invasive procedure to treat these patients. Lifelong endograft surveillance is mandatory to detect and treat late complications after EVAR.

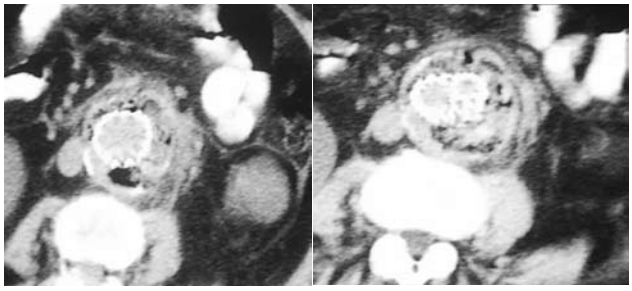

Figure 4. Postoperative CT scan with patent endograft and no signs of endoleak. Air within the sac suggests closure over the maintained endograft.

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