

Endovascular Repair of a Ruptured Mycotic Aneurysm of the Common Iliac Artery

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Abstract This report describes the case of a ruptured mycotic aneurysm of the left common iliac artery, successfully treated with endovascular stent-grafting. A 64-year-old woman underwent diagnostic coronary angiography complicated by an infected hematoma of the left groin. Seven days later, she developed methicillin-resistant *Staphylococcus aureus* septicemia and CT scan evidence of perivascular inflammation around the left common iliac artery. This was followed by rupture of a mycotic aneurysm of the left common iliac artery. The lesion was successfully treated with a stent-graft and prolonged antibiotic therapy, and the patient remains free of infection 10 months later. Accumulating evidence suggests that endovascular repair can be used safely for the repair of ruptured infected aneurysms.

Keywords Ruptured · Mycotic aneurysm · Common iliac artery · Endovascular repair

Introduction

Although endovascular stent-grafting is not standard therapy for mycotic aneurysms, there is a gradual realization that endovascular repair together with long-term antibiotic therapy is a viable option in selected patients [1–4], particularly when the aneurysm is caused by relatively low-

virulence organisms such as *Salmonella* species [5, 6]. Similarly, endovascular repair of ruptured iliac artery aneurysms has been reported in the literature [7]. Less reported is stent-graft repair of ruptured mycotic aneurysm of the aorta or iliac arteries caused by infection with a virulent organism such as methicillin-resistant *Staphylococcus aureus* (MRSA). An English-language literature search of MEDLINE found two reported cases [8, 9] of ruptured mycotic aneurysm of the iliac artery and one of the abdominal aorta secondary to MRSA, which were treated endovascularly with successful outcomes [10]. We report the case of a ruptured mycotic aneurysm of the left common iliac artery (CIA) secondary to MRSA infection, which was successfully treated with placement of stent-grafts.

Case Report

A 64-year-old female patient underwent percutaneous coronary angiography through a left common femoral artery approach. Due to body habitus (body mass index: 37), access was difficult; the rest of the procedure was uneventful. The patient developed a groin hematoma, was observed overnight, and was discharged the next day. Seven days later she represented with severe lower abdominal pain and clinical evidence of sepsis. Her white cell count was $18.6 (\times 10^9/L)$ and the serum C-reactive protein level was 192 mg/L. The patient was hemodynamically stable, with a hemoglobin level of 11.9 g/dl. A CT scan of her abdomen and pelvis was ordered, which revealed minimal perivascular edema around the left CIA [10]. Blood cultures revealed MRSA septicemia and she was treated with intravenous vancomycin antibiotic therapy.

Eight days later the patient developed an acute exacerbation of the lower abdominal pain. By then a pulsatile

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Fig. 1 A large ruptured left common iliac artery mycotic aneurysm revealed on a CT scan (left) and repeat angiography (right)

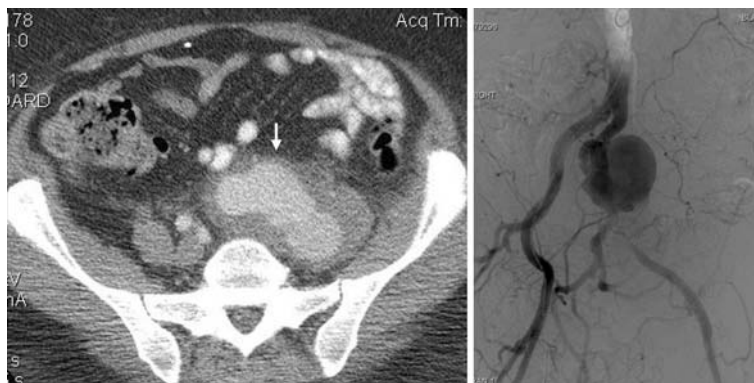
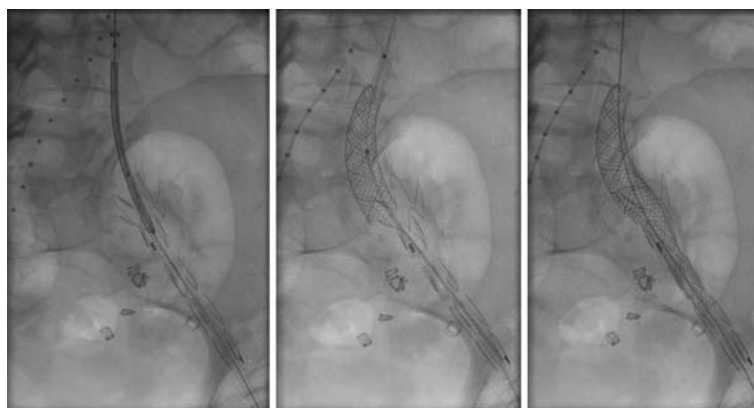


Fig. 2 Sequential DSA images recording deployment of the two 14-mm Wallgrafts within the migrated Talent device (left to right)



mass was palpable in the left iliac fossa, together with extensive bruising in the left groin. She had remained hemodynamically stable, but there was a drop in hemoglobin level to 8.6 g/dl. She remained septic, with a white cell count of $22 (\times 10^9/L)$ and serum C-reactive protein level of 261 mg/L. A CT scan of the abdomen confirmed the diagnosis of a ruptured mycotic aneurysm of the left CIA (Fig. 1).

Surgical treatment of this lesion was unattractive because of the patient's body habitus, general condition, and previous bilateral long saphenous varicose vein surgery, limiting the availability of biological conduit for bypass. The decision was made to perform endovascular repair of this lesion with embolization of the left internal iliac artery (IIA).

Under general anesthesia, percutaneous access into the right common femoral artery was gained. The left IIA was occluded by coil embolization. The left femoral artery was exposed through a groin incision, to enable the insertion of a 16-mm Talent covered stent-graft (75 mm long; Medtronic, Minneapolis, MN). During the removal of the nose cone, the device migrated distally, therefore two 14-mm Wallgraft endoprotheses (5 mm long; Schneider, Minneapolis, MN) were deployed within the Talent device and across the defect of the false aneurysm (Fig. 2).

A CT scan 7 days following the procedure revealed a proximal endoleak (Fig. 3). This was confirmed on angi-

ography and was successfully treated with the insertion of a further proximal stent-graft (14-mm Wallgraft), again through the left femoral approach (Fig. 4).

The patient was maintained on intravenous antibiotic therapy and her general condition gradually improved. She was discharged home on day 26, on long-term oral antibiotic therapy. Upon discharge the white cell count was $10 (\times 10^9/L)$ and the serum C-reactive protein level was 48 mg/L. Upon discharge the patient was switched to oral antibiotic therapy in the form of rifampicin and trimethoprim.

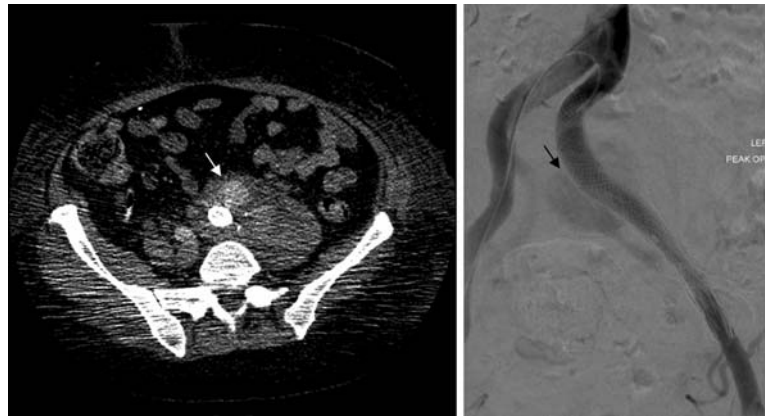
She remains alive and well 10 months later. She developed nondisabling intermittent claudication due to in-stent stenosis. This has been treated successfully with percutaneous stenting. She is maintained on oral antibiotic therapy.

Duplex follow-up of the area shows that the aneurysm remains excluded and the inflammatory mass is resolving. Exclusion of the aneurysm was also confirmed at angiography 8 months after the initial presentation.

Discussion

Improved diagnostic procedures, appropriate antibiotic therapy, and safe surgical techniques have reduced the high mortality associated with mycotic aneurysms of the aorta

Fig. 3 Type 1 endoleak following stent-graft exclusion of the left common iliac artery mycotic aneurysm revealed on a CT scan (**left**) and repeat angiography (**right**)



and iliac vessels [11]. However, definite evidence-based conclusions with regard to a surgical strategy cannot be drawn from the data available in the published literature due to the paucity of reports and lack of large patient series [3]. Accumulating evidence in the literature suggests that endovascular treatment may offer a benefit, especially in critically ill patients or those with significant severe medical comorbidities [9].

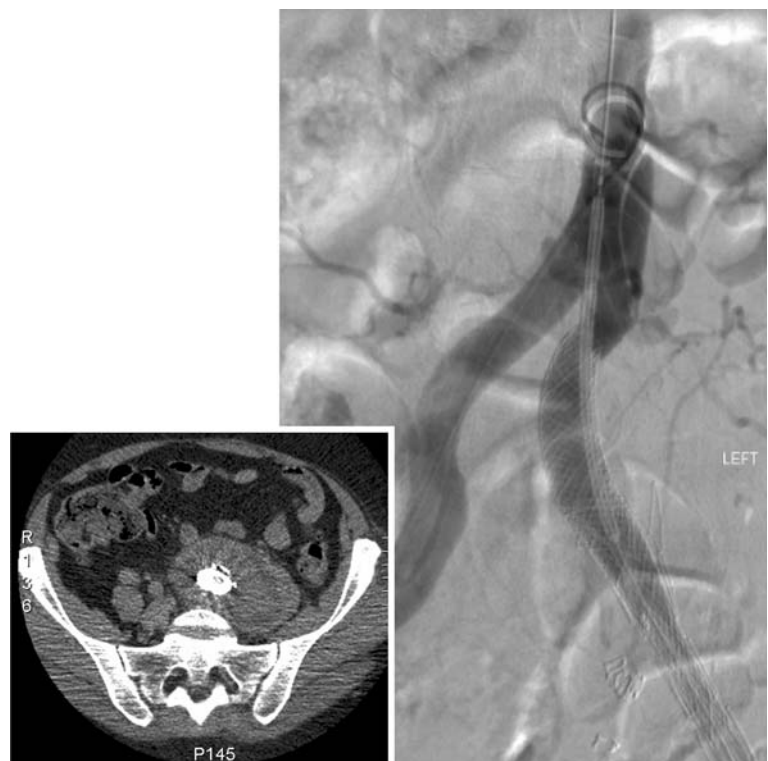
In this case the progression of CT findings from subtle perivascular edema to a ruptured mycotic aneurysm (Fig. 1) was rapid, occurring over 8 days. This has also been the experience of Serafino et al. [10]. Therefore in the presence of persistent sepsis and clinical findings suggesting the presence of an aneurysm, a recent CT scan that

does not reveal a mycotic aneurysm cannot serve to reassure the clinicians that such a lesion has not developed since the last imaging [10].

Endovascular repair of ruptured mycotic aneurysms of the abdominal aorta and iliac arteries avoids the risks associated with a long procedure requiring aortic cross-clamping and its associated high mortality [11]. Endovascular therapy interferes minimally with either subsequent endovascular or open surgical repair if the initial endovascular repair is unsuccessful. In this case it was possible to treat the early endoleak with placement of a further endovascular device.

In this study the authors used a covered unilateral iliac stent to treat a mycotic aneurysm of the CIA. This ap-

Fig. 4 Successful exclusion of the endoleak in Fig. 3 revealed on a postprocedure CT scan (**left**) and completion angiography (**right**)



proach necessitated prior coil embolization of the left IIA [12]. Insertion of a unilateral iliac stent was possible, as this aneurysm was saccular in morphology and its neck was situated well below the aortic bifurcation (Fig. 1). An alternative endovascular approach to a CIA aneurysm is the insertion of a bifurcated aortic stent-graft [12]. Such an approach may obviate the need for coil embolization of the IIA, although in this case, the proximity of the neck of the aneurysm to the common iliac bifurcation would have necessitated coil embolization of the left IIA. Greenberg et al. reported encouraging results for the endovascular management of CIA aneurysms with branched endovascular grafts which preserve IIA blood flow and remove the need for embolization of the IIA [13].

There have been continuing concerns that endovascular repair does not allow for surgical debridement of the infected tissues, and that the presence of a foreign body in an infected area presents a risk of continued infection despite antibiotic treatment [3, 9]. The intraluminal position of the stent-graft does not seem to eliminate the risk of graft infection [3].

Nevertheless, this Case Report confirms the feasibility of endovascular repair of ruptured mycotic aneurysm of the CIA. This may be a valuable and lifesaving option, which can be performed quickly and safely in patients with a life-threatening condition and precludes the need for a difficult, prolonged high-risk procedure with significant mortality in the emergency setting.

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