Combined Endovascular/Surgical Management of a Ruptured Para-Anastomotic Aneurysm of the Left Common Iliac Artery[#]

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Abstract: A 75-year old man presented with signs and symptoms of acute abdomen and a clinical picture of hypovolemic shock. An emergency CT scan revealed a ruptured para-anastomotic left common iliac artery aneurysm. The patient had undergone an elective abdominal aortic aneurysm repair operation and placement of an aortoiliac bifurcated graft 10 years before. Para-anastomotic aneurysms had developed in all 3 (aortic and the 2 iliac) anastomosis. As the patient was high-risk, a combined endovascular/surgical approach was undertaken. The patient was discharged 4 days later.

This article discusses the applicability of endovascular procedures in emergency settings to high-risk patients.

Keywords: Endovascular procedures, high-risk patients, ruptured aneurysm repair, EVAR.

INTRODUCTION

Ruptured abdominal aortic aneurysms (rAAAs) have mortality rates as high as 90%; about half of the patients die before reaching the hospital [1]. The surgical repair of rAAAs has a perioperative mortality of up to 70% [2]. Compared with open repair, endovascular aneurysm repair (EVAR) is associated with lower perioperative (as well as long-term) mortality rates [3]. A recent retrospective study reviewing a single centre's 10-year experience with emergency EVAR for ruptured abdominal aortoiliac aneurysms showed a 30-day mortality rate as low as 13% [4]. It has been supported that "EVAR should be the gold standard for rAAAs" [5].

We present a high-risk patient with a ruptured para-anastomotic iliac artery aneurysm treated successfully with a combined endovascular and surgical approach.

CASE REPORT

A 75-year old man arrived at the Emergency Department of our Hospital with signs and symptoms of acute abdomen and a clinical picture of hypovolemic shock. His physical examination revealed a tender pulsatile mass in the lower abdomen. The following vital signs were recorded: blood pressure: 90/65 mmHg; heart rate: >100 beats/min; temperature: 37.0 °C. The patient had a hematocrit of 26.5 and a haemoglobin concentration of 8.4 g/dl.

His past medical history included an elective open abdominal aortic aneurysm repair operation with employment of an aortoiliac bifurcated bypass graft 10 years ago. A follow-up CT examination 2 years later had showed the development of para-anastomotic aneurysms in all 3 (the aortic and the 2 iliac) anastomoses. The patient suffered from chronic obstructive pulmonary disease and arterial hypertension. He had suffered an acute myocardial infarction in 2006 for which he had undergone a 3-vessel coronary artery bypass graft operation. Furthermore, he was suffering from moderate to severe cardiac insufficiency (ejection fraction: 30%). As he was a high-risk individual, it was decided that a conservative approach should be undertaken for the 3 para-anastomotic aneurysms; an annual CT scan was performed at another center to evaluate their enlargement.

An emergency abdominal CT scan revealed a rupture of the left common iliac artery aneurysm (Fig. **1a**). A digital subtraction angiography verified the diagnosis (Fig. **1b**).

Due to the patient's severe co-morbidities, a combined endovascular/surgical approach was adopted. By use of a Merate 9-inch C-arm in the operating theatre, an aorto-uni-iliac Cook Zenith® endovascular graft 36-121 mm (Cook Medical, Bloomington, IN, USA) was employed on the left side to seal the ruptured aneurysm. A second Cook Zenith® endovascular graft 12-105 mm (Cook Medical, Bloomington, IN, USA) was added as an extension. On the contralateral side, a 14-mm plug was inserted in the right external iliac artery. Finally a traditional open surgical femoral-femoral bypass was performed by use of a GORE polytetrafluoroethylene 8 mm ringed graft (Gore Medical Products, Flagstaff, AR, USA) to provide blood supply to the contralateral limb.

During the procedure, both internal iliac arteries were spared. The total amount of radio-opaque material used was approximately 90 mm. The pre- and post-operative blood cultures did not reveal any micro-organism which could be

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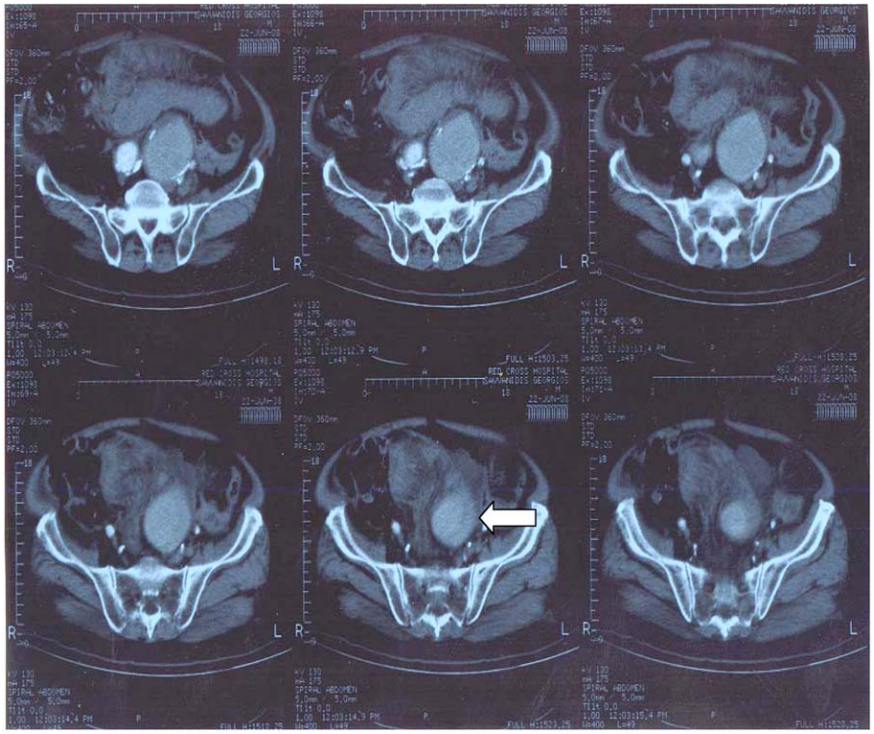

Fig. (1a). A CT scan showing the ruptured left iliac para-anastomotic aneurysm (arrow).

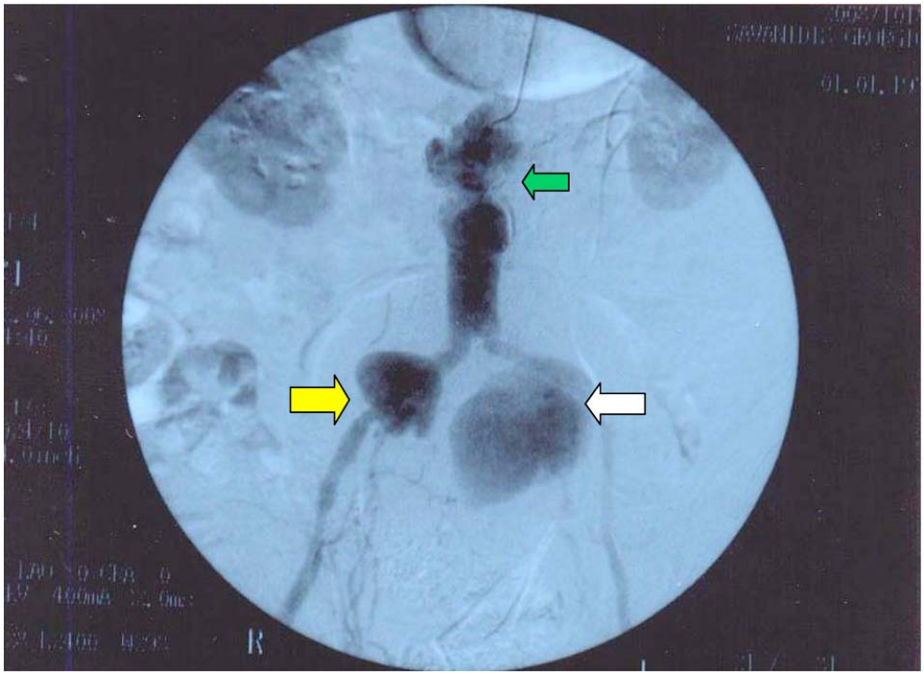

Fig. (1b). Digital subtraction angiography showing the ruptured left common iliac para-anastomotic aneurysm (white arrow), as well as the right common iliac (yellow arrow) and aortic (green arrow) para-anastomotic aneurysms.

held responsible for the development of the 3 para-anastomotic aneurysms.

The patient was hemodynamically stable during the procedure. The post-operative clinical course was excellent; the patient did not suffer from buttock claudication. He was released 4 days post-procedurally. A 3-D digital computed and magnetic aortography performed 3 months later revealed an excellent post-procedural outcome with no endoleaks (Figs. **2a** & **2b**).

DISCUSSION

By adopting a combined endovascular/surgical procedure, both the ruptured and the 2 other para-anastomotic aneurysms were successfully managed. Furthermore, as the patient was high-risk, the complications of a traditional open surgical procedure were avoided. The advantages of the endovascular approach for the management of the ruptured left common iliac artery aneurysm included avoidance

Fig. (2a). 3-D digital computed aortography 3 months following the procedure.

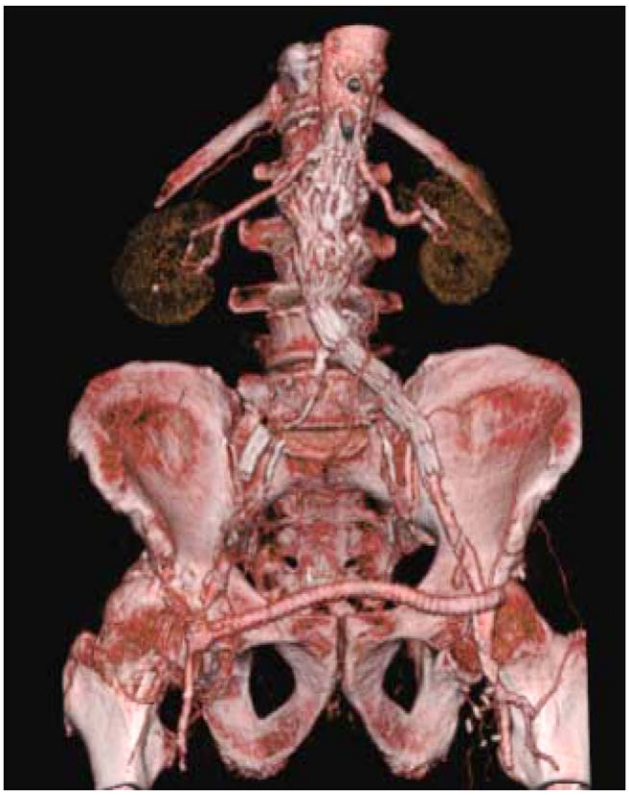

Fig. (2b). 3-D digital magnetic aortography 3 months following the procedure.

of extensive blood loss, avoidance of compromising the hemodynamic stability and a fast and painless recovery.

The adoption of EVAR for rAAAs decreases periprocedural mortality compared with open surgical repair. A recent

survival analysis comparing the results of EVAR vs. open surgical repair for rAAAs in a patient cohort of 43,033 Medicare beneficiaries suffering a rAAA matched by propensity score showed a benefit of EVAR over open surgical repair (P=0.0042) [3]. This advantage is extremely important, especially when considering the fact that most patients with AAAs are high-risk individuals. The considerable advantages that are coupled with EVAR (namely decreased mortality/morbidity rates and decreased hospital stay) render endovascular approaches more preferable when compared with open surgical repair operations [3-5].

In conclusion, our case lends support to the opinion that EVAR should be the treatment-of-choice for ruptured aneurysms if the appropriate conditions are feasible [4, 5]. The numerous advantages of this less invasive procedure may render EVAR the treatment-of-choice for the management of ruptured arterial aneurysms.

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