

Splenic rupture secondary to ruptured abdominal aortic aneurysm

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SOUHRN

Rupturu aneurysmatu břišní aorty je nutno rychle diagnostikovat a co nejdříve zahájit její léčbu; v opačném případě je toto postižení spojeno s vysokou mortalitou. U pacientů s rupturou aneurysmatu břišní aorty je třeba zkontrolovat stav orgánů v oblasti břicha a rozhodnout o vhodném léčebném postupu. V této kazuistice popisujeme pacienta s časnou rupturou sleziny, u něhož byla pro rupturu aneurysmatu břišní aorty provedena endovaskulární náhrada aorty (endovascular aortic replacement, EVAR).

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ABSTRACT

Abdominal aortic aneurysm (AAA) rupture requires rapid diagnosis and treatment and has a high mortality rate without treatment. In patients with abdominal aortic aneurysm rupture, the conditions of the abdominal organs should be evaluated and the treatment approach should be determined accordingly. In this report, we present our patient with early splenic rupture who underwent endovascular aortic replacement (EVAR) due to ruptured AAA.

Introduction

Abdominal aortic aneurysm (AAA) is a progressive disease that is more common in older ages. Hypertension, advanced age, smoking, and genetic predisposition are generally defined as risk factors in patients. It is most common at the age of 65 and over. It occurs three times more often in men than women.^{1–4}

When left untreated, the size of the aneurysm grows progressively and results in fatal rupture. The risk of aneurysm rupture has been shown to be proportional to aneurysm size, with aneurysms measuring less than 5.4 cm having an annual rupture rate of approximately 1%, whereas those greater than 7.0 cm in diameter have an annual rupture rate of 32.5%.⁵ The treatment of abdominal aortic aneurysm is performed either as conventional surgery or EVAR.

In the case of AAA rupture, the abdominal organs should be examined and the treatment strategy should be determined according to the situation. In this report, we present the patient with early splenic rupture who underwent endovascular aortic replacement (EVAR) due to ruptured AAA.

Case report

A 69-year-old male patient presented to the emergency department with a sudden onset of abdominal pain and weakness. In the examination, his general condition was poor, his blood pressure was 70/40 mmHg and his heart rate was 124/minute. A pulsatile mass with no murmur was detected in the abdomen. Peripheral pulses were weakly palpable. Computed tomography (CT) revealed a 7.5 cm diameter ruptured abdominal aortic aneurysm in the infrarenal segment and 15 × 8.5 cm hematoma in the left retroperitoneal area (Figs 1, 2). The patient was taken to the angiography unit and EVAR was performed (Fig. 3). On the first postoperative day, the patient underwent abdominal CT again due to the development of defense and rebound in the abdomen and a decrease in hemoglobin level. CT showed no contrast leakage in the abdominal aorta and stent graft. However, there was a rupture in the splenic capsule and hematoma around it (Figs 4–6). The patient was consulted with the general surgery clinic. Splenectomy was performed with a median laparotomy. Retroperitoneal hematoma was cleared. On the postoperative 20th day, multiorgan failure developed due to septic shock and the patient died.

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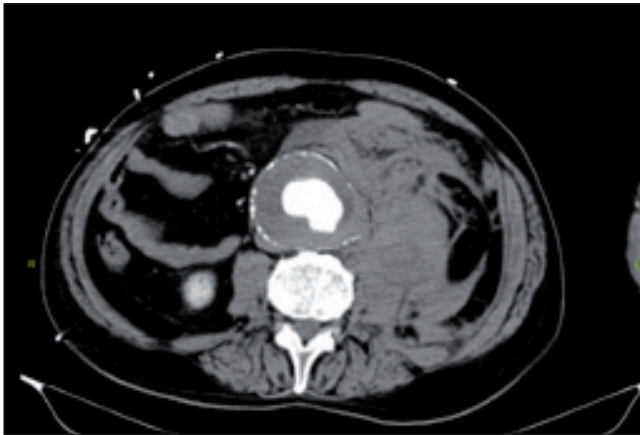


Fig. 1 – Preoperative computed tomography (CT) revealing a 7.5 cm diameter ruptured abdominal aortic aneurysm in the infrarenal segment and 15 × 8.5 cm hematoma in the left retroperitoneal area.

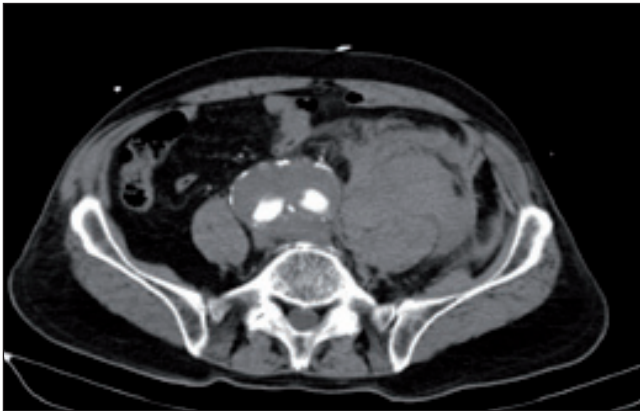


Fig. 2 – Preoperative computed tomography (CT) revealing a 7.5 cm diameter ruptured abdominal aortic aneurysm in the infrarenal segment and 15 × 8.5 cm hematoma in the left retroperitoneal area.



Fig. 3 – Intraoperative image.

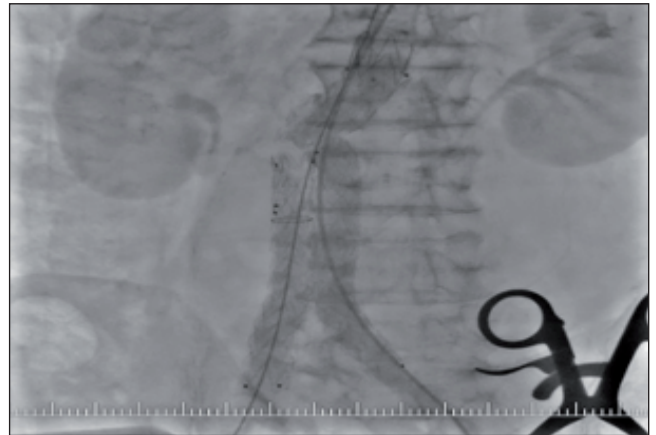


Fig. 4 – Intraoperative image of EVAR.

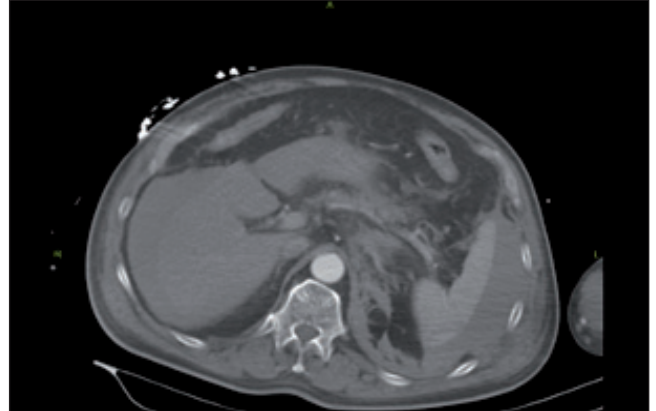


Fig. 5 – Postoperative computed tomography (CT) revealing rupture in the splenic capsule and hematoma around it.

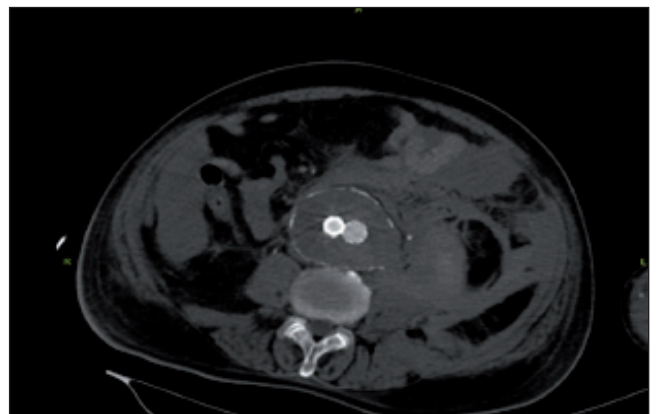


Fig. 6 – Postoperative computed tomography (CT) revealing rupture in the splenic capsule and hematoma around it.

Discussion

Abdominal aortic aneurysm may be treated with open surgery or EVAR. Conventional surgery is the procedure of removing the aneurysmatic segment and placing a syn-

thetic graft in its place. The patient is faced with serious morbidity and mortality due to reasons such as major surgery by opening the abdomen, ischemia-reperfusion injury due to aortic clamping time, blood transfusion, and infection.^{6,7}

EVAR is the process of placing a stent in the aneurysm using a delivery mechanism through the femoral artery in the angiography unit. EVAR was first applied by Parodi in 1991 and is now being performed in many vascular centers.⁶ Some studies showing that postoperative morbidity and mortality rates decrease in the early period with the EVAR method, have been published rapidly.⁷

In a cochrane study, EVAR was shown to reduce early mortality rates compared to open repair, but long-term outcomes were not different with open surgery.⁸ The EVAR method is successfully performed in suitable patients with rupture.^{9,10}

AAA case with rupture is expected to become hemodynamically stable in the early period after repair by surgical or EVAR method. Despite all interventions, it is generally thought that rupture continues in hemodynamic instability. In our patient, hemoglobin level remained low in the early period despite blood transfusions. Although the fluid support and high dose inotropic agents treatment, hypotension and tachycardia persisted. It was thought that the rupture was continuing in the retroperitoneal region and control CT was performed. CT showed no leakage in the abdominal aorta and stent. Splenic rupture and extensive hematoma in the retroperitoneal area were detected. The patient urgently underwent splenectomy via laparotomy.

In cases of AAA with rupture, the condition of the abdominal and retroperitoneal organs should be evaluated using clinical or imaging systems. The addition of another pathology to ruptured AAA, which has high mortality rates, may increase the mortality rate. In this case, we observed that the increase in the amount of hematoma in the retroperitoneal area was caused by a rupture in the capsule of the spleen.

We believe that a vascular surgeon approaching a ruptured AAA case should keep this rare pathology in mind and adjust the surgical strategy accordingly.

Conflict of interest

None.

References

1. Wilmink AB, Pleumeekers HJ, Hoes AW. The infrarenal aortic diameter in relation to age: only part of the population in older age groups shows an increase. *Eur J Vasc Endovasc Surg* 1998;16:431–437.
2. Scott RA, Wilson NM, Ashton HA, Kay DN. Influence of screening on the incidence of ruptured abdominal aortic aneurysm: 5-year results of a randomized controlled study. *Br J Surg* 1995;82:1066–1070.
3. Vlijmen-van Keulen CJ, Pals G, Rauwerda JA. Familial abdominal aortic aneurysm: a systematic review of a genetic background. *Eur J Vasc Endovasc Surg* 2002;24:105–116.
4. Vardulaki KA, Walker NM, Day NE. Quantifying the risks of hypertension, age, sex and smoking in patients with abdominal aortic aneurysm. *Br J Surg* 2000;87:195–200.
5. Gorham TJ, Taylor J, Raptis S. Endovascular treatment of abdominal aortic aneurysm. *Br J Surg* 2004;91:815–827.
6. Parodi JC, Palmaz JC, Barone HD. Transfemoral intraluminal graft implantation for abdominal aortic aneurysms. *Ann Vasc Surg* 1991;5:491–499.
7. Greenhalgh RM, Brown LC, Kwong GP, et al. EVAR trial participants. Comparison of endovascular aneurysm repair with open repair in patients with abdominal aortic aneurysm (EVAR trial 1), 30 day operative mortality results: randomised controlled trial. *Lancet* 2004;364:843–848.
8. Paravastu SCV, Jayarajasingam R, Cottam R, et al. Endovascular repair of abdominal aortic aneurysm. *Cochrane Database Syst Rev* 2014 Jan 23;(1):CD004178.
9. Peppelenbosch N, Yilmaz N, Marrewijk C, et al. Emergency treatment of acute symptomatic or ruptured abdominal aortic aneurysm. Outcome of a prospective intent-to-treat by EVAR protocol. *Eur J Vasc Endovasc Surg* 2003;26:303–310.
10. Badger S, Forster R, Blair PH, et al. Endovascular treatment for ruptured abdominal aortic aneurysm. *Cochrane Database Syst Rev* 2017;5:CD005261.