

CASE REPORT

VASCULAR SURGERY // INTERNAL MEDICINE

A Rare Case of Abdominal Aortic Aneurysm with Ureteral Compression

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ARTICLE HISTORY

Received: May 12, 2021
Accepted: May 23, 2021

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ABSTRACT

Introduction: In this report, we present a rare case of aortic aneurysm with associated left ureter obstruction and consequent hydronephrosis. **Case presentation:** A 62-year-old man was admitted for epigastric and periumbilical pain, extended in the spine, and anuria. As for associated diseases, he presented arterial hypertension stage II/III, chronic ischemic cardiomyopathy, acidosis, hyperpotassemia, spondylosis with radiculopathy, acute renal failure, renal lithiasis, and eating difficulties. After performing a CT scan, the patient was diagnosed with giant abdominal infrarenal aortic aneurysm with ureter compression, and retroperitoneal rupture with common and internal iliac arteries occlusion. We performed a xifo-pubian laparotomy with endoaneurysmorrhaphy and aortoiliac bilateral bypass using silver Dacron vascular prosthesis (16 × 8 mm in diameter). Douglas drainage was necessary, ending with laparoraphy. The patient presented a favorable postoperative evolution. **Conclusion:** Open surgery remains the gold standard method of treatment for large aortic aneurysms, given the inability of endovascular procedures to solve problems caused by compression.

Keywords: laparotomy, ureteral compression, Douglas drainage, laparoraphy, abdominal aortic aneurysm

INTRODUCTION

An abdominal aortic aneurysm (AAA) is a vascular disorder of multifactorial origin, with a high fatality rate. AAA represents a significant challenge for the surgeon because of the extensive periaortic inflammation, and retroperitoneal and perianeurysmal fibrosis, which can compromise the structure of the urinary tract.

Progressive expansion, compression of the visceral organs, rupture, but also embolization and thrombosis are the main characteristics of an AAA.¹ In developed countries, AAA represents 1–3% of the incidence of mortality concerning men aged 65–85 years. It is more common in men, but it seems that female patients have a higher risk of rupture and worse prognosis.² Risk factors for the development of AAA include atherosclerosis, cerebrovascular disease, coronary

artery disease, first-degree relative with AAA, history of other vascular aneurysms, hypercholesterolemia, hypertension, male gender, obesity, older age, and tobacco use.

Patients are usually complaining about back pain and abdominal pain, but sometimes the AAA is asymptomatic until the rupture occurs, which can be a real catastrophe. Patient monitoring, using abdominal ultrasound, computed tomography (CT) angiography, and magnetic resonance (MR) angiography, plays an important role in attenuation of the rupture risk and also provides an accurate measurement of the aneurysm size.³ AAA with ureteral obstruction occurs in 35% of patients with obstructive uropathy.⁴ Compared to open surgical repair, endovascular interventions are preferred in AAA due to the low mortality and morbidity. Dissection and vascular control are challenging in the open surgical intervention, and there is also a significant risk of accidental injury of the surrounding visceral structures such as the ureters, left renal vein, inferior vena cava, duodenum, and sigmoid colon.⁵

CASE PRESENTATION

We present the case of a 62-year-old man, who at first presented to the emergency department of a territorial hospital, complaining of pain in the epigastric and umbilical regions, accompanied by anuria and extension of the pain in the back. The complaints started suddenly, 48 hours before. After CT imaging, the patient was diagnosed with giant abdominal aortic aneurysm with ureteral compression (Figure 1). He was transferred to a tertiary care hospital, the

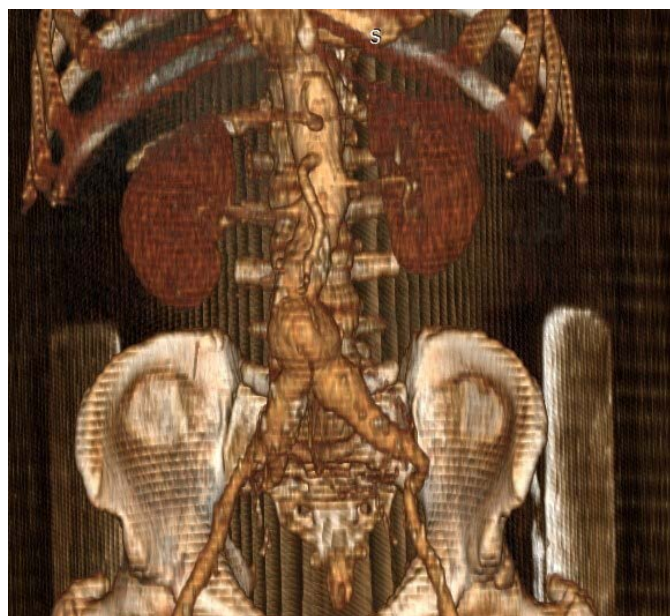


FIGURE 1. Abdominal aortic aneurysm with ureteral compression

Vascular Surgery Clinic of the Emergency Clinical County Hospital of Târgu Mureș, Romania. As comorbidities, he had arterial hypertension stage II/III, chronic ischemic cardiomyopathy, acidosis, hyperpotassemia, spondylosis with radiculopathy, acute renal failure, renal lithiasis, and eating difficulties. The patient went into surgery, at the beginning of which a small/medium amount of ascites was found in the abdominal cavity, without blood in the peritoneum. We exposed the giant pulsatile tumoral mass and prepared the abdominal aorta and the iliac arteries bilaterally (Figure 2). The left common iliac artery and the left internal iliac artery were aneurysmal and thrombosed, without pulsation. Systemic heparinization, 2500 Ivo in bolus was given before clamping the subrenal aorta and iliac arteries. A longitudinal incision was performed along the aneurysm until the healthy aorta wall, and extended to the aortic bifurcation. Intraluminal thrombosis was discovered together with a thick aortic wall (3 cm), injury/rupture of the posterior aortic wall (ca. 5 × 5 cm) above the spine, and the presence of retrograde blood flow from the right common iliac artery. A T-T proximal anastomosis at subrenal aortic level was performed using a 4.0 surgi-pro wire. A silver Dacron bifurcated vascular prosthesis (16 × 8 mm diameter) was inserted (Figure 3). The branches of the prosthesis were clamped to the proximal anastomosis, and the body was clamped again. Next, we performed a bilateral aortoiliac tunneling. On the left side we also performed a T-T anastomosis with a 4.0 surgical wire, with the ligation of the proximal arterial branch. On the right side a T-L anastomosis was performed using 4.0 surgical wire. The aorta was unclamped, the hemostasis was managed, and the aneurysmal sac was sutured over the vascular prosthesis. The patient agreed to the pub-



FIGURE 2. Infrarenal aortic aneurysm

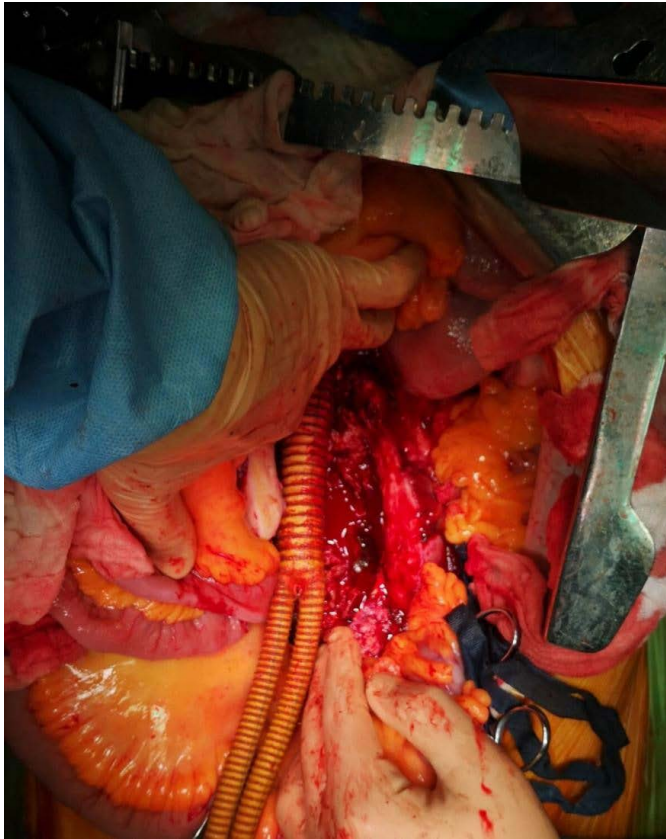


FIGURE 3. Silver Dacron bifurcated vascular prosthesis

lication of his data and the institution where the patient had been admitted, approved the publication of the case.

DISCUSSIONS

Besides pharmacological treatment, there are two common types of surgical treatment for AAA: endovascular (interventional placement of a stent graft) and open repair (vascular graft via laparotomy). Selection of the type of repair is strictly individualized, depending on age, anatomy, and comorbidities. In a German clinical research (practice guideline published) in 2018, the majority of patients received endovascular treatment (EVAR), and only those with a lower morbidity rate benefited from open surgery. As a result, the 30-day mortality rate was lower in patients with EVAR (1.16%), compared to those with open repair (3.27%). The study concluded that endovascular treatment offers a higher degree of safety and is more preferred for patients with asymptomatic AAA.⁶

Open AAA repair can have several major complications such as myocardial infarction, pulmonary edema, cardiac arrhythmia, and acute renal failure. Elderly patients and smokers have a higher risk of major complications. In a retrospective cohort study, the authors analyzed the correla-

tion between fluid balance and complications in 100 consecutive patients. Patients with complications had greater cumulative positive fluid balance after surgery, from $p < 0.01$ on day 0 to $p < 0.04$ on day 3. Moreover, they had significantly longer stays in the intensive care unit and in the hospital.⁷

Besides complications that occur during the AAA repair, there are also graft-related complications. In a study that included 307 patients who underwent AAA repair between 1957 and 1990 at the Mayo Clinic and two affiliated hospitals, 29 patients had graft-related complications. The most common complication was anastomotic pseudoaneurysm (3%), followed by graft thrombosis, graft infection, graft-enteric erosion/fistula, colon ischemia, and atheroembolism.⁸

Another factor that impacts recovery after an AAA repair is gender. According to a population-based survey in Sweden, patients with ruptured AAA showed significant differences in recovery between women and men, and female patients presented a greater risk of death in case of a symptomatic aneurysm (81.1% for women and 68.5% for men).⁶

CONCLUSIONS

Open surgery remains the gold standard method of treatment for large aortic aneurysm, given the inability of endovascular procedures to solve problems caused by compression.

CONFLICT OF INTEREST

Nothing to disclose.

REFERENCES

- Legg JS, Legg LM. Abdominal Aortic Aneurysms. *Radiol Technol*. 2016;88:145-163.
- Ullery BW, Hallett RL, Fleischmann D. Epidemiology and contemporary management of abdominal aortic aneurysms. *Abdom Radiol*. 2018;43:1032-1043.
- Aggarwal S, Qamar A, Sharma V, Sharma A. Abdominal aortic aneurysm: A comprehensive review. *Exp Clin Cardiol*. 2011;16:11-15.
- von Fritschen U, Malzfeld E, Clasen A, Kortmann H. Inflammatory abdominal aortic aneurysm: A postoperative course of retroperitoneal fibrosis. *Journal of Vascular Surgery*. 1999;30:1090-1098.
- Wilt TJ, Lederle FA, Macdonald R, Jonk YC, Rector TS, Kane RL. Comparison of endovascular and open surgical repairs for abdominal aortic aneurysm. *Evid Rep Technol Assess (Full Rep)*. 2006;144:1-113.
- Schmitz-Rixen T, Böckler D, Vogl TJ, Grundmann RT. Endovascular and Open Repair of Abdominal Aortic Aneurysm. *Dtsch Arztebl Int*. 2020;117:813-819.
- McArdle GT, Price G, Lewis A, et al. Positive Fluid Balance is Associated with Complications after Elective Open Infrarenal Abdominal Aortic Aneurysm Repair. *European Journal of Vascular and Endovascular Surgery*. 2007;34:522-527.
- Hallett JW, Marshall DM, Petterson TM, et al. Graft-related complications after abdominal aortic aneurysm repair: Reassurance from a 36-year population-based experience. *Journal of Vascular Surgery*. 1997;25:277-286.