

AN UNUSUAL CAUSE OF HEMATURIA AND FLANK PAIN

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Abstract

Hematuria and flank pain are a typical urology emergency, often presented as the primary complaint. However, in patients with previous aortoiliac surgery, these symptoms may rarely indicate external compression of the urinary tract by an anastomotic pseudoaneurysm. We herein describe an unusual case of a 50-year-old man who presented to the urologist with hematuria and right flank pain due to ureteric compression by an aortic anastomotic pseudoaneurysm. He had undergone an open aortoiliac revascularization procedure with a bifurcated graft 9 years earlier and the pseudoaneurysm was found at the proximal anastomosis pressurizing the right ureter. The patient was successfully treated with a pigtail placement and an endograft implantation resulting in resolution of his symptoms. Urological symptoms in patients with a history of previous aortoiliac surgery should raise the suspicion of an anastomotic pseudoaneurysm.

Keywords: aortic anastomotic pseudoaneurysm, hematuria, flank pain, endograft, ureter compression

INTRODUCTION

Non-traumatic hematuria and flank pain are common symptoms in the emergency room and encompass a spectrum of etiologies, including urinary tract infections, kidney stones, kidney tumors, bladder cancer, and other certain kidney diseases (e.g. IgA nephropathy⁽¹⁾). Notably, thorough evaluation of such symptoms with imaging modalities may reveal extrinsic compression of the ureter, involving occasionally major vascular structures, such as the renal artery or infrarenal aorta⁽²⁾.

In the presence of a history of retroperitoneal surgical treatment with an open aortoiliac bifurcated graft, an aortic anastomotic pseudoaneurysm represents a rare but severe clinical entity that could potentially put pressure on the urinary tract constituting a sinister sign for unilateral ureteral obstruction⁽³⁾. Diagnosis requires a high index of suspicion and treatment strategy consists of various vascular surgical options, including the endovascular means.

We describe a rare case of hematuria and flank pain due to pressure by an aortic anastomotic pseudoaneurysm on the right ureter that was treated by endovascular means in our unit.

METHODS

The patient provided written informed consent for treatment and report of his case details and imaging examinations. No protected health information was disclosed. No institutional review board approval was required.

CLINICAL CASE

A 50-year-old male presented to the urologist complaining of intermittent hematuria and progressive right flank pain. He was a heavy smoker. Nine years earlier, he had undergone an open aortoiliac revascularization procedure with a bifurcated graft, which was anastomosed distally to the common femoral artery on the right and to the common iliac artery on the left. Computed tomography (CT) demonstrated hydronephrosis of the right kidney and dilatation of the upper one-third of the ipsilateral ureter, which was in close proximity with the aortic bifurcated graft. Despite the pigtail insertion, the pain and microscopic hematuria persisted.

Following a vascular surgery consult, a CT angiography was performed and revealed an aortic pseudoaneurysm involving the proximal anastomosis of the graft and pressurizing the right ureter (Figure 1). The patient was transferred to our unit for definitive management. Apart from the open aortoiliac procedure, he had a complex arterial history due to peripheral arterial disease, including right and left iliac stenting 11 years earlier, and right common femoral artery patch endarterectomy and iliac stent-grafting 10 years earlier. He also suffered a thrombosed right common femoral artery pseudoaneurysm with severe claudication and limb ischemia 5 years earlier, but he refused any intervention. Finally, 4 years earlier, he underwent above knee amputation of his right limb due to tissue necrosis. There were no clinical, analytical, microbiological or imaging signs suggestive of graft infection. Given the patient's poor general health status, anatomic imaging characteristics, and as graft infection was not suspected, an endovascular approach was preferred.

The initial aorto-bi-iliac/femoral graft was 16 mm x 8 mm in size and the infrarenal aorta proximal to the aortic anastomosis measured approximately 14 mm in diameter, that is a proximal landing zone of 14 mm in diameter and a distal landing zone of 8 mm in diameter. Although many limbs and/or aortic cuffs from different manufactures would have been acceptable options, a slightly oversized tapered tube endograft would be ideal to fit this anatomy. As a result, we opted for a 16 mm x 12 mm x 120 mm Gore Excluder limb (W.L. Gore and Associates Inc., Flagstaff, AZ). Under local anesthesia and a left common femoral artery cutdown, the Excluder limb was advanced through a 12 Fr-33 cm DrySeal Flex introducer sheath (Gore) and was deployed at the intended position. The endograft was subsequently dilated with a molding balloon. Completion angiogram confirmed satisfactory exclusion of the aortic pseudoaneurysm (Figure 2).

The patient had an uneventful recovery and his symptoms resolved. Post-procedural antithrombotic treatment included single antiplatelet therapy with clopidogrel (75mg OD). He had been under regular follow-up in the outpatient clinic. At 1 year, CT documented shrinkage of the pseudoaneurysm (Figure 3). The patient died approximately 3 years later due to lung cancer and brain metastases.

DISCUSSION

Aortic anastomotic pseudoaneurysms are late complications of previous open aortic repair for occlusive or aneurysmal disease resulting from the loss of anastomotic structural integrity⁽⁴⁾. These pseudoaneurysms have been increasingly recorded among patients with a history of aortic reconstruction and are associated with high morbidity and mortality rates⁽⁵⁾. More rarely, aortic pseudoaneurysms have

been observed in cases related to gallstone pancreatitis or Brucella infection^(6, 7). Edwards et al⁽⁸⁾ in their retrospective cohort study monitored 111 patients with aortic grafts and found 7 patients with anastomotic pseudoaneurysms. Of these, 5 pseudoaneurysms were at the aortic anastomoses, 1 was at the iliac anastomosis, and 1 was at the proximal aortorenal anastomosis. The life-table analysis indicated that the incidence of anastomotic pseudoaneurysm was 1% at 8 years but increased up to 20% by 15 years⁽⁸⁾. Indeed, in our case, the anastomotic pseudoaneurysm was found 9 years after the open aortoiliac procedure.

Aortic pseudoaneurysm remains one of the main life-threatening complications following aortic surgery since it may lead to devastating sequelae, including rupture with massive hemorrhage⁽⁹⁾. Of equal concern is the potential for fistula formation between the urinary tract and aorta, presenting with massive hematuria. It is reasonable to assume that risk factors for such a fistula include history of pelvic surgery, previous radiation therapy, and history of prolonged ureteral stenting⁽¹⁰⁾. Even though diagnosis may be demanding, the combination of episodes of macroscopic hematuria with a surgical history of aortoiliac grafting should raise clinical suspicion⁽³⁾. Interestingly, in an earlier stage, an anastomotic pseudoaneurysm may put pressure on the nearby ureter causing various symptoms, including progressive flank pain and intermittent hematuria. Perhaps, the most important educational point of this case is that hematuria and flank pain in a patient with previous aortoiliac grafting should prompt consideration of an anastomotic pseudoaneurysm or, in more advanced cases, a possible aorto-ureteric fistula.

There is no established treatment algorithm for the management of aortic anastomotic pseudoaneurysm. Traditional open surgical repair may be associated with a high rate of perioperative morbidity and mortality, whereas, endovascular means are considered less invasive and, thus, guarantee lower mortality and morbidity rates⁽¹¹⁾. In a recent study, Nowrouzi et al⁽⁴⁾ followed 102 patients, with a history of open distal aortic repair, who underwent 108 repairs for anastomotic pseudoaneurysms of the distal aorta. An open approach was used in 81% and an endovascular approach in 19% of patients. Eight operative deaths were recorded, with no deaths in the endovascular group. The investigators concluded that anastomotic pseudoaneurysms are severe complications that can be treated endovascularly and surgically with acceptable outcomes⁽⁴⁾. Another retrospective study indicated that endovascular treatment of anastomotic pseudoaneurysms with aortic cuffs, especially under local anesthesia, has been attempted with satisfactory early and midterm results⁽¹²⁾. Therefore, center experience, infection status, and pseudoaneurysm location should be taken into consideration before opting for the appropriate treatment strategy. Individualized care tailored to each patient is the most effective management of this intricate disease.

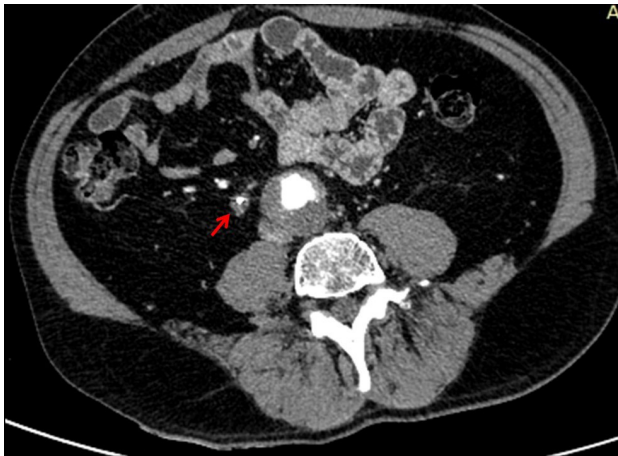


Figure 1a)

Preoperative CT angiography. Axial views (a-d) showing the pigtail catheter (red arrow) into the right ureter and the anastomotic pseudoaneurysm along with its close proximity and pressure to the right ureter. 3D reconstruction (e) demonstrating the aortoiliac bifurcated graft (ABIG) and the pseudoaneurysm (white arrow) at the proximal anastomosis (e). Key: APA: anastomotic pseudoaneurysm; Rt: right; Lt: left

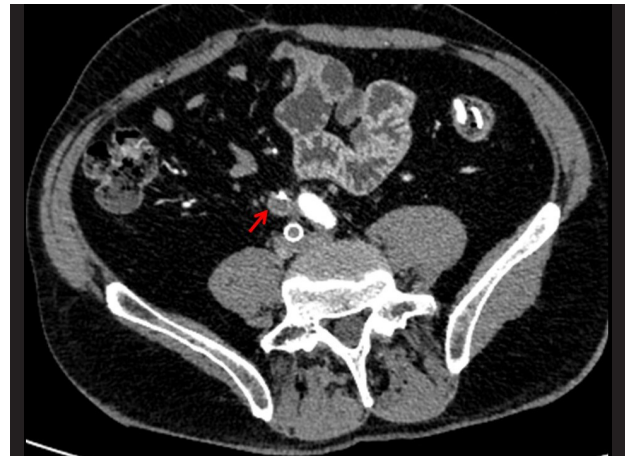


Figure 1d)



Figure 1b)



Figure 1c)

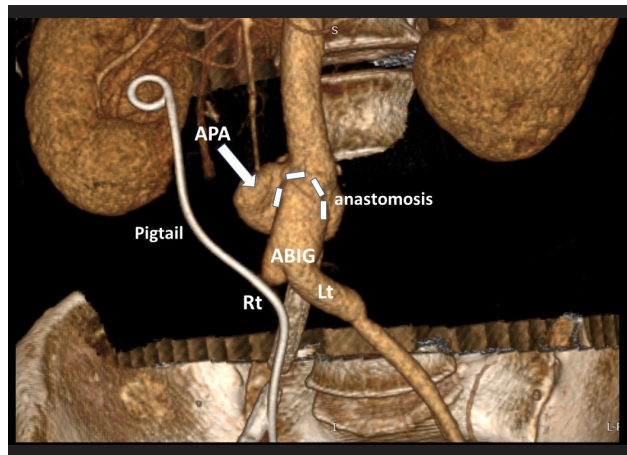
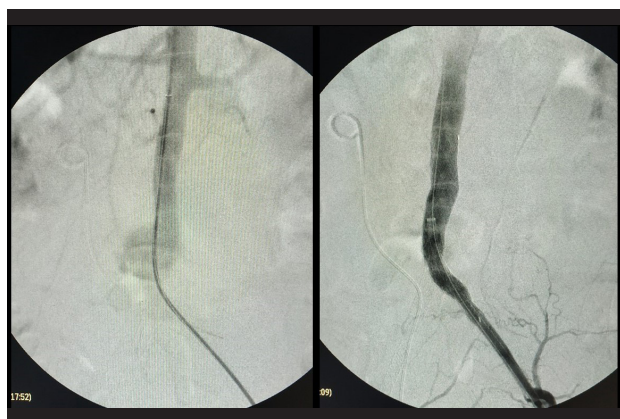


Figure 1e)


Figure 2

Intraoperative angiogram displaying the successful deployment of the stent graft.


Figure 3

One-year postoperative CT angiography showing shrinkage of the anastomotic pseudoaneurysm.

CONCLUSIONS

Aortic anastomotic pseudoaneurysms continue to be a severe, but fortunately rare complication following aortic reconstructive procedures, occasionally imitating urinary tract symptoms, such as hematuria and flank pain. Prompt and accurate diagnosis requires high index of clinical suspicion and is essential due to the potential for significant morbidity and mortality. Endovascular exclusion may represent a safe and effective alternative to open repair in selected patients, particularly when infection is not suspected and surgical risk is high.

Declaration of Conflicting Interests

The authors declare that there is no conflict of interest with respect to the research, authorship, and publication of this article.

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