A 63-year-old Caucasian male presented with a 4-month history of low back pain associated with bilateral intermittent claudication. A contrast enhanced CT scan demonstrated a 4 cm abdominal aortic aneurysm (AAA), along with severe bilateral aorto-iliac disease, a right psoas collection, and extensive vertebral erosion. An MRI of the lumbar spine suggested spondylodiscitis at L4–L5. After an unsuccessful and prolonged course of antibiotics, a decision was ultimately made to repair the aneurysm and bypass the aorto-iliac disease. Intra-operatively, a chronic contained rupture (CCR) involving the posterior aortic wall was encountered and repaired with an aorto-bifemoral bypass graft.

Keywords: chronic contained rupture (CCR), abdominal aortic aneurysm (AAA), vertebral erosion

Introduction

A chronic contained rupture of an abdominal aortic aneurysm (CCR-AAA) is a well-documented subtype of abdominal aortic aneurysm (AAA) rupture in which the hematoma is sealed by the retro-peritoneum. Patients with a sealed AAA rupture often present a diagnostic and therapeutic dilemma as they lack the typical features of hemorrhagic shock usually seen with frank rupture. Patients are often stable for variable periods of time and may only present with abdominal or back pain, symptoms also seen with uncomplicated AAA.¹

Although contrast enhanced computed tomography (CT) and magnetic resonance imaging (MRI) are the diagnostic modalities of choice in sealed AAA,² we have recently encountered a case with misleading radiological features that resulted in a delay in management. In this patient, an abdominal aortic aneurysm presented with radiological evidence of vertebral spondylodiscitis and a psoas collection that was presumed to be secondary to an infective process. These radiological findings were subsequently found to be due to a contained AAA rupture with no signs of sepsis intra-operatively.

Fortunately, the delay in diagnosis did not alter the long-term outcome and the patient recovered well after appropriate surgical management.

Case Report

We report a case of a 63-year-old Caucasian male who is a chronic smoker, hypertensive, and dyslipidemic. He was presented with a 4-month history of low back pain and a 1-year history of limiting bilateral intermittent claudication. On examination, he had a pulsatile expansile abdominal mass with absent femoral and distal pulses. The ankle-brachial index was 0.61 on the right and 0.46 on the left with no distal tissue loss. The rest of the examination was otherwise unremarkable with good cardiac and respiratory status. Further lab workup including a complete blood count, renal function, liver function, coagulation profile, and erythrocyte sedimentation rate (ESR) were normal except for an elevated C-reactive protein (CRP) of 26.

The initial CT aortogram showed a 4 cm infra-renal AAA (Fig. 1). Visualization of the common iliac arteries revealed tight stenosis and focal occlusion on the right and left side respectively. In addition, a right-sided 5 cm × 2.8 cm psoas muscle collection was evident along with erosion of the L4 vertebrae (Fig. 2). A lumbar spine MRI confirmed this collection and showed evidence of spondylodiscitis at L4–L5 manifesting by erosive vertebral changes.

Our provisional diagnosis was therefore spondylodiscitis at L4–L5 complicated by vertebral erosion and a psoas abscess. Although it was suspected, whether or not the aorta was involved in the infective process or even ruptured with a contained hematoma was a question yet to be answered.

With these findings in mind, the patient was immediately referred to our infectious disease and neurosurgery service that opted to treat the spine infection non-operatively and obtain a CT-guided aspirate of the psoas collection.
A small amount of yellowish turbid fluid was obtained. The sample, however, yielded negative culture results and the patient was ultimately put on a prolonged antibiotic course. A repeat MRI of the lumbar spine 2 months later revealed a slight improvement of the discitis and psoas collection with no other significant changes.

Although our patient’s back pain slightly improved with antibiotics, he still complained of claudication that was limiting his normal daily activities. A decision was ultimately made to surgically repair the abdominal aortic aneurysm and bypass the aorto-iliac occlusive disease.

Nevertheless, the possibility of aortic wall infection and abdominal sepsis required careful pre-operative planning. An axillo-bifemoral bypass had to be considered in the event that an infected field was encountered intra-operatively.

On the morning of the procedure, our patient spiked a high fever of 39°C associated with rigors. A septic workup revealed a markedly elevated white cell count and a rise in his CRP level from 26 to 78. After a detailed review of the patient, a collective decision involving our anesthetist and intensivist was made to monitor and stabilize the patient in an ICU setting. An CT aortogram at this time showed a significant 1 cm increase in the size of the AAA (within 3 months of the previous CT scan). After 24 h in the ICU, the patient was still haemodynamically stable and the fever had settled with no other potential source of infection. We, therefore, decided to proceed with the operation.

A trans-peritoneal anterior approach was undertaken. Extensive small bowel and duodenal adhesions to the anterior wall of the aorta were encountered. Consequently, a lateral approach to the aorta was undertaken from the left side. After systemic heparinazation, proximal and distal control was achieved as routine. Aortotomy was performed in the usual fashion. After evacuating a large aortic thrombus, we encountered a 5 cm × 3 cm perforation in the distal posterior aortic wall with no frank pus or any signs of purulence (Fig. 3). Cultures of the aortic wall and thrombus all yielded negative results for bacteria and fungi including TB and brucellosis. An aorto-bifemoral bypass using a silver impregnated Dacron graft was performed with no complications. The patient recovered well post-operatively and had palpable bilateral pedal pulses. He was discharged from the hospital on the 6th day post-operatively in excellent condition and an ABI of 1.0 bilaterally. By 2 weeks post-op, he was mobilizing with no difficulty and his back pain had disappeared. A follow-up CT scan and MRI 2 months later revealed a marked reduction in the psoas collection together with a resolving discitis. He continues to be in excellent condition.

**Discussion**

A chronic contained rupture of an abdominal aortic aneurysm is a well known phenomena first described by Szilagyi et al. in 1961. While AAA is a common disorder, CCR-AAA constitute only 4% of all ruptured aortic aneurysms. The diagnostic criteria for CCR-AAA has been recently described as the following: (1) known AAA; (2) previous pain symptoms that may have resolved; (3) a patient whose condition is stable and whose hematocrit is normal; (4) a CT scan showing a retroperitoneal hematoma; and
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Although seen in only 7% of uncomplicated AAA and 2% of cases with frank rupture, vertebral erosion was found in all 6 patients with CCR-AAA reported by Apter et al. It is believed that the continuously pulsating aneurysm compressing the vertebral body produces extensive bone destruction. Yet, it is imperative to differentiate the vertebral erosion caused by a CCR-AAA from that caused by infection. Erosions caused by CCR-AAA are usually smooth, in comparison to that caused by a vertebral pyogenic infection in which bony destruction is usually irregular and poorly delineated. While vertebral erosion has been documented in several reported cases of CCR-AAA as a misleading finding denoting primary spinal pathology, Apter et al. suggests that it can be helpful in diagnosis. Although seen in only 7% of uncomplicated AAA and 2% of cases with frank rupture, vertebral erosion was found in all 6 patients with CCR-AAA reported by Apter et al.

Halliday and Al-Kutoubi describe another CT sign typical for a contained leak known as the “draped aorta” sign. The posterior wall of the aorta drapes along the contour of the adjacent vertebral body and becomes indistinct from the surrounding structures. During a second view of our patient’s CT scan, a draped aorta sign was clearly seen raising our suspicion of a contained rupture even more so. Apter et al. also reported this sign in all six of their patients and only 1 of the 68 controls.

Thus, we confirm that a combination of vertebral erosion together with a draped aorta sign seen on CT can be helpful in distinguishing a contained rupture from uncomplicated AAA. Awareness and recognition of such typical features on CT can avoid a delay in diagnosis, which can have life threatening consequences despite the stable clinical condition of the patient on initial presentation.

Conclusion

This report confirms that chronic contained rupture of AAA truly exists. Clinically, it can mimic infective spondylodiscitis, and presents with peculiar radiological findings. Therefore, a high index of suspicion is required to prevent life threatening consequences.

Disclosure Statement

All authors have no conflict of interest regarding the publication of this paper.

References