

## ЗАМІТКИ ІЗ ПРАКТИКИ

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Shaafiya Ashraf<sup>1</sup>, Ankit Prabhakar<sup>1</sup>, Shivani Sharma<sup>2</sup>, Dawood Iqbal Wani<sup>3</sup>**Radiological Findings in Chronic Contained Rupture of Abdominal Aortic Aneurysm in a Patient Presenting with Lower Back Pain**<sup>1</sup>Department of Radiodiagnosis and Imaging, Government Medical College Srinagar, India.<sup>2</sup>Department of Obstetrics and Gynaecology, Government Medical College Jammu, India.<sup>3</sup>Department of Surgery, Government Medical College Jammu, India.

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**Abstract.** There is a diagnostic and therapeutic dilemma in cases of chronic contained rupture of abdominal aortic aneurysm, as the symptoms can be more subtle including dull back pain, and thus lacking the typical features of rupture.

**The objective** of this research was to introduce a case report emphasizing the need to relate the low back pain with atypical radiological appearances of entities, as aortic abdominal aneurysms, capable to compromise the patients' clinical diagnosis, prognosis and treatment.

**Keywords:** back pain; aneurysm; rupture; aorta

**Background**

A well-known yet rare entity known as "chronic contained rupture of an abdominal aortic aneurysm" (CCR-AAA) is a subtype of abdominal aortic aneurysm (AAA) rupture (2.7% of operated infrarenal AAAs). In this case, the retroperitoneum seals off the hematoma by compressive resistance to extravasation [1].

There is a diagnostic and therapeutic dilemma in these cases, as the symptoms of CCR can be more subtle and include abdominal or back pain, and thus lacking the typical features of hemorrhagic shock usually seen in frank rupture (mortality of about 60%) [2].

The clinical picture of AAA may present as the classical triad of pain, shock and pulsatile abdominal mass, which in few cases can affect the vertebral integrity [3]. Other symptoms, like obturator neuropathy, obstructive jaundice and groin herniation, sometimes occur [4].

A thorough clinical and radiological workup including careful look at all structures surrounding the vertebral body is essential. Computed tomography (CT) is the most reliable diagnostic test, while pathology confirms an organized hematoma [5]. Since the contained leaks are at high risk for free rupture, urgent intervention is necessary. Mortality in CCR-AAA is equivalent to that associated with aortic aneurysms repaired electively, if it is detected radiologically and repaired early. Surgical options include either open or endovascular procedures.

**The objective** of this work was to introduce a case report emphasizing the need to relate the low back pain with atypical radiological appearances of entities, as aortic abdominal aneurysms, capable to compromise the patients' clinical diagnosis, prognosis and treatment.

We present a case of CCR-AAA leading to vertebral destruction and total thrombosis, as evidenced by contrast-enhanced CT and magnetic resonance imaging (MRI).

**Case Presentation**

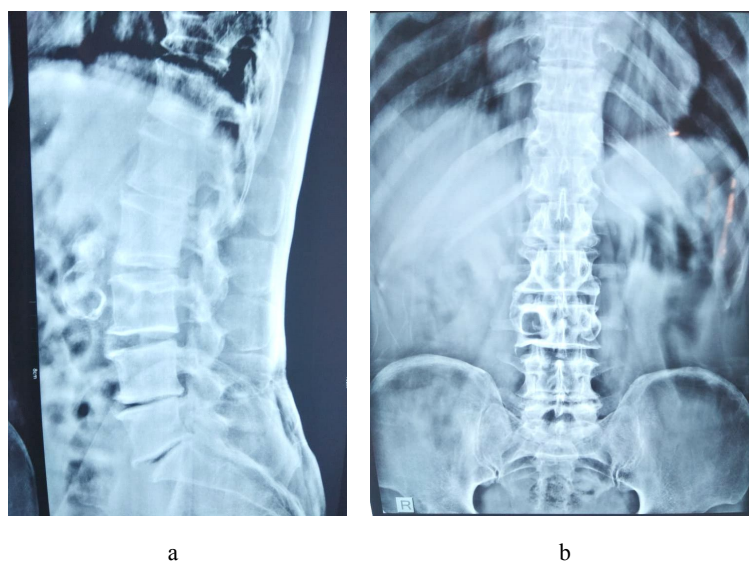
We report a case of a 65-year-old Asian male who presented to an orthopedician with a history of back pain. His medical history included non-hypertensive, non-diabetic, euthyroid status. He had no past surgical history. His physical examination revealed heart rate of 76 beats/minute, blood pressure of 126/84 mm Hg. Laboratory findings revealed haemoglobin level of 13.8 mg/dL (normal value range: 12.2–15.2 mg/dL). He presented with a 4-month history of low back pain. 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 was normal. His local spine examination was normal. He was, thus, referred to our department for further work up for the cause of back pain.

**Imaging Findings**

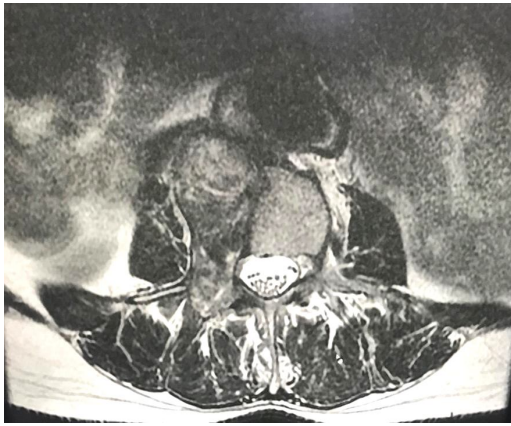
The initial lumbar sacral (LS) spine X-ray revealed degenerative spondylotic changes with marginal osteophytes and reduced disc height at multiple levels, especially the L4-L5 and the L5-S1 levels.

Increased lucency at the L3 vertebral body on the right side with mild sclerotic margins was present. Tubular calcification was seen in the prevertebral region (Fig. 1).

LS MRI showed well-defined altered marrow signal with expansion seen in the right L3 vertebral body and pedicle measuring approximately 3.3 x 6.5 cm (transverse and anteroposterior). It showed sclerotic margins with deficient anterior cortex and extending contiguously into the prevertebral



**Fig. 1.** a) Lateral LS spine view with tubular calcification in the prevertebral region opposite the L3 vertebra; b) anteroposterior LS spine view with increased lucency at the L3 vertebral body on the right side with mild sclerotic margins



a



b



c



d



e



f

Fig. 2. a) T2 axial image; b) T2 sagittal image; c) post-contrast T1 axial image; d) post-contrast T1 sagittal image; e) post-contrast T1 coronal image; f) 3-D angio reconstruction

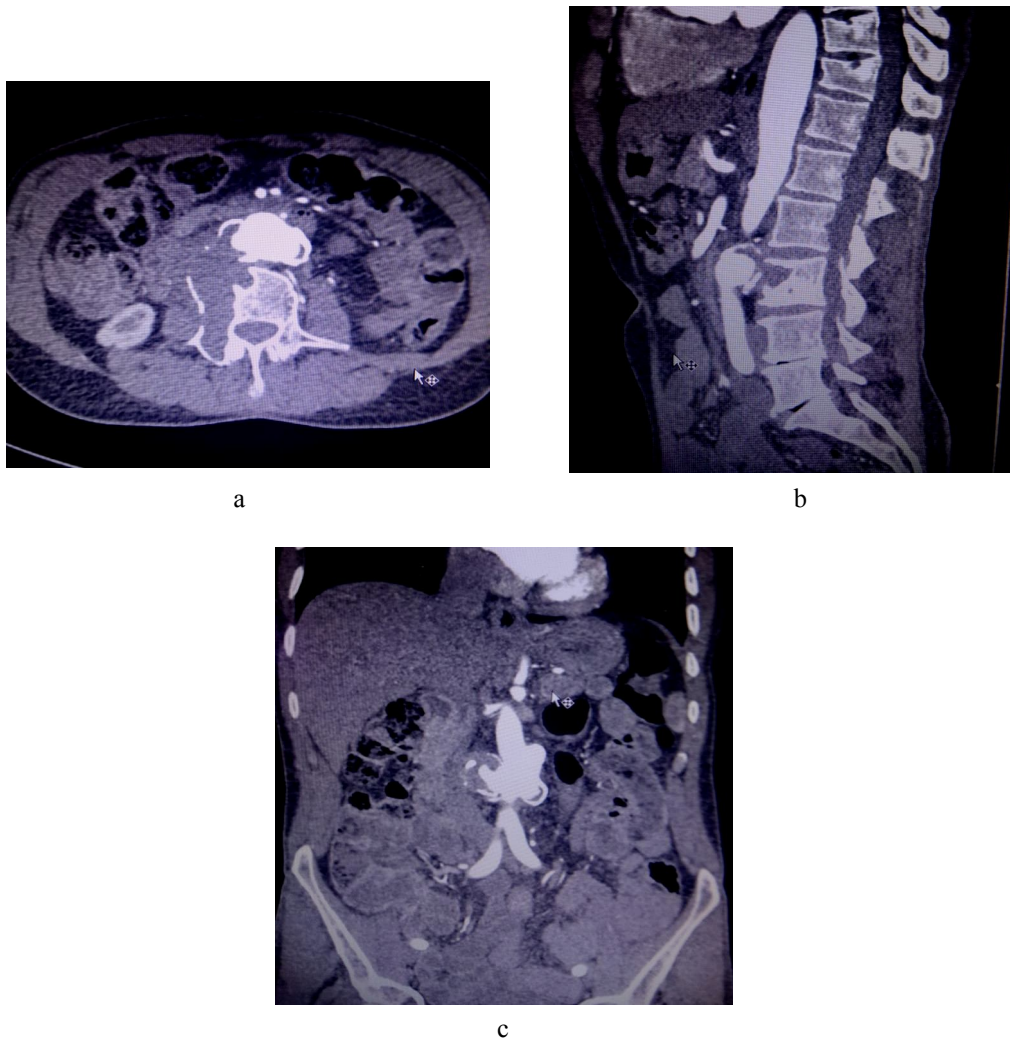


Fig. 3. a) Axial post-contrast image; b) sagittal image; c) coronal image

space, reaching up to the abdominal aorta. A suspicious aortic wall defect measuring 2.2 x 3 cm was seen. The aorta showed focal irregular dilation at the site with maximum diameter of 3.9 x 2.8 cm, for a length of 3 cm. It showed focal outpouchings at the superior and inferior ends of the dilated segment towards the left. The superior outpouching measured 12 x 12 mm and the inferior one measured 10 x 13 mm in size.

The content of the lesion showed peripheral hyperintensity on T1 weighted images with no significant post-contrast enhancement (Fig. 2).

Background degenerative spondylotic changes were noted in the lumbar spine as well.

The patient underwent contrast 256-slice multi-detector computed tomography (MDCT) that confirmed multiple saccular outpouchings arising from the abdominal aorta about 3 cm distal to the origin of renal arteries, extending over a length of about 4 cm. The largest outpouching on the right side measured 7 x 5 x 4 cm which showed thrombosis with peripheral wall calcification and caused scalloping/erosion of the L3 vertebral body extending up to the posterior elements. Another outpouching was present on the left side measuring 1.4 x 1.9 cm and showed partial thrombosis of the lumen. The volume rendered and maximum intensity projection images demonstrated the extent of the aneurysm and showed normal origins of the celiac, superior mesenteric, and bilateral renal arteries. There was no accessory

renal artery, and no active extravasation of contrast into the periaortic soft tissue was seen (Fig. 3).

Retrospectively, ultrasonogram of the abdomen was done which showed a fusiform aneurysm of the infrarenal aorta, measuring 4 cm in craniocaudal span, and having a maximum transverse diameter of 5 cm, exhibiting turbulent flow on Doppler ultrasonography (USG) (Fig. 4).

Our provisional diagnosis was therefore AAA with multiple areas of contained rupture in the right as well as the left wall; the right-sided component causing erosion and expansion of the L3 vertebral body and pedicle with the contents in the vertebral body showing predominant thrombosis with little contrast enhancement.

Thereof, the decision of surgical repair of AAA with a graft was ultimately taken by the surgeon.

Intraoperative findings were confirmed, which showed a large aortic thrombus with lateral wall perforation in the right aortic wall.

Follow up: Repeated CT of the lumbar spine 4 months later revealed the improvement in the status of the patient with the graft.

#### Discussion

CCR-AAA was first described by Szilagyi et al. in 1961 [6]. Only 4% of all ruptured aortic aneurysms is constituted by CCR-

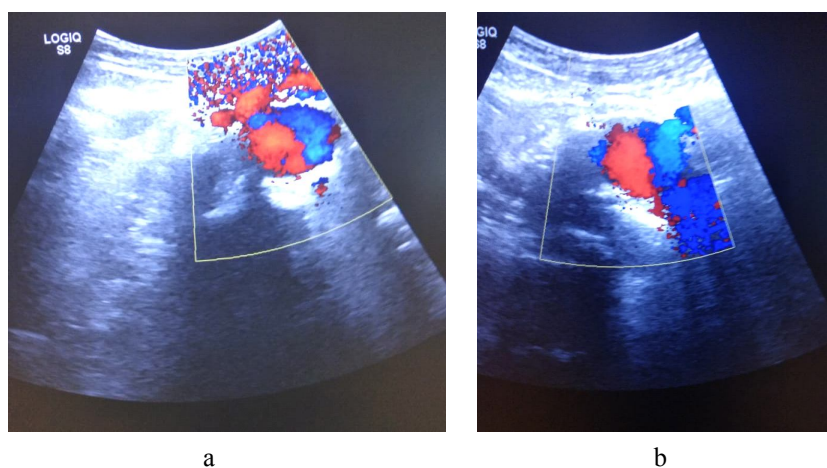


Fig. 4. a) Colour Doppler USG; b) colour Doppler USG

AAA [7].

The diagnostic criteria for CCR-AAA has been recently described: known AAA; previous pain symptoms that may have resolved; a patient whose condition is stable and whose haematocrit is normal; CT scan showing retroperitoneal hematoma; pathological confirmation of organized hematoma. However, this entity may manifest itself with misleading clinical and radiological findings.

It is imperative to differentiate vertebral erosion caused by CCR-AAA from that caused by pyogenic infection. In CCR-AAA, erosions are usually smooth, whereas in vertebral pyogenic infection, bony destruction is irregular and poorly delineated [9].

Halliday and Al-Kutoubi mentioned a 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 [10].

This imaging finding was observed in all 6 patients with a contained leak, and only 1 patient of the 68 controls [11]. Furthermore, the draped aorta sign can differentiate a contained rupture from both uncomplicated AAA and a frank rupture. The latter may be suspected when overt contrast media leakage through the retroperitoneal tissue is seen.

A high attenuating “crescent sign” is caused by blood leakage through the mural thrombus, indicating imminent rupture [12]. Unenhanced CT should be performed first to reveal acute bleeding through the mural thrombus.

The draped aorta sign was considered in this case, as a distinct line between the lateral wall of the aorta and the adjacent structures was not identifiable, in addition to the fact that the posterior aorta followed the lumbar vertebral contour [10, 11].

Another specific imaging finding observed in this case was smooth and well-corticated vertebral body erosions with sclerotic borders, which is usually caused secondary to chronic repetitive arterial pulsations of aneurysms [11].

Additional important imaging findings in chronic contained aneurysms like soft tissue density in vicinity of the aorta, displaced

abdominal structures, discontinuous rim of calcification in the arterial wall and lack of contrast appearance in the mural hematoma also serve as clues for diagnosis; all of them were observed, to some extent, in the present case.

### Conclusions

Thus, we confirm that CCR-AAA should be considered clinically in the differential diagnosis of back pain and radiologically in the differential diagnosis of anterior erosion of the lumbar vertebrae. Awareness and recognition of such typical signs 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.

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