

AORTIC RUPTURE COMPLICATING THE FRACTURE OF AN ANKYLOSED LUMBAR SPINE

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Key-word: Aorta, rupture

Background: A 79-year-old man was transferred to the emergency department after a fall on the forehead. On arrival, he seized and went into shock and apnea. His medical history included ankylosing spondylitis and alcoholism with recurrent falls. An initial ultrasonographic examination was strongly limited by obesity and intestinal air. Therefore, a CT scan of the abdomen was immediately performed.

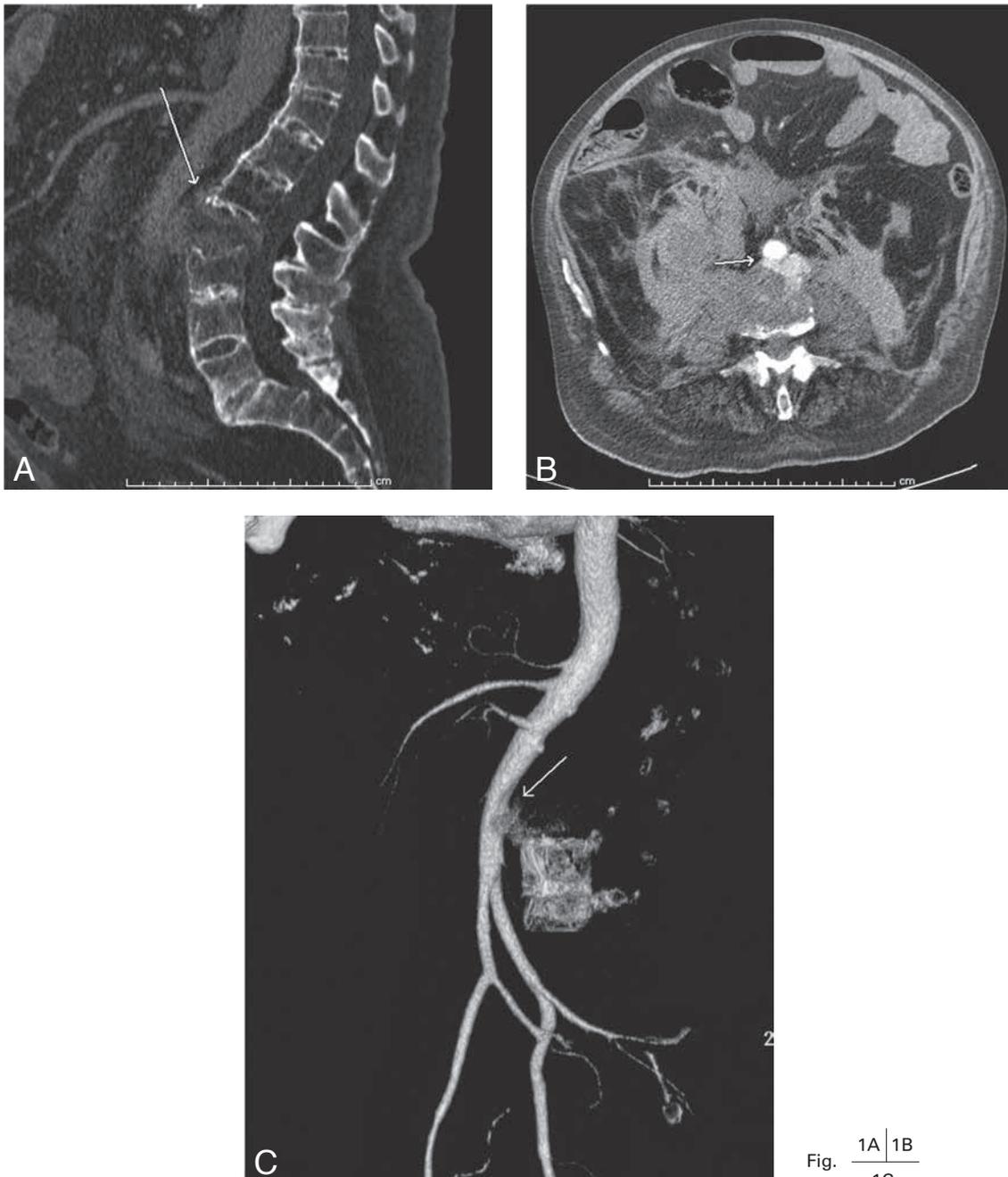


Fig.

1A	1B
1C	

Work-up

CT scan of the abdomen (Fig. 1), sagittal reformatted image (MPR) (bone window setting) (A) shows horizontal fracture through the intervertebral ankylosis at the level L2-L3 and severe diastasis of the intervertebral space at this level (arrow). Contrast-enhanced CT scan of the abdomen in the arterial phase (B) demonstrates infrarenal aortic laceration (arrow) with retroperitoneal bleeding reaching the intervertebral space. 3D volume rendered reconstruction (C) reveals a tear at the level of the infrarenal segment of the aorta (arrow).

Radiological diagnosis

Based on the radiological findings, the diagnosis of *traumatic abdominal aortic rupture in association with a fractured ankylosed lumbar spine segment* was made. In the presented case, the patient underwent surgery with infrarenal bifurcal aortic prosthesis placement.

Discussion

Ankylosis of the spine results in biomechanical changes that are predisposing patients with ankylosing spondylitis (AS) to serious spinal injury. The forces necessary to invoke a spinal fracture in such patients, are much smaller than in patients without ankylosis. Even minor trauma can cause spinal fracture in these circumstances and sometimes fractures occur without any recognizable trauma. The cervical spine is reported to be the most common site for fracture in patients with AS.

Vascular complications due to spinal fracture in patients with AS are very rare. Aortic injuries in association with spinal fractures in AS patients are due to direct mechanical trauma or blunt forces associated with the spinal fracture.

However, laceration may be the result of pathophysiological changes that cause the aorta to become firmly adherent to the anterior longitudinal ligament and subject this structure to shearing

forces during fracture dislocation. In our case the laceration occurred at the level of the ostium of the lumbar artery.

MDCT with multiplanar reconstruction is the imaging modality of choice in patients with advanced ankylosing spondylitis and suspicion of spinal fracture. As demonstrated CT findings in more advanced AS often show ankylosed vertebral segments (joints, discs and ligaments variably involved) with sometimes the typical ‘bamboo spine’ appearance. Spinal fractures in AS patients often involve the three columns with or without dislocation. Fractures occur more often at the cervicothoracic and thoracolumbar junctions. Minimally displaced fractures are often difficult to detect due to osteopenia and deformity, and it is important to specifically look for disk space widening and discontinuity of the ossified paraspinal ligaments. Aortic laceration in association with spinal fracture in patients with AS is manifested by signs of retroperitoneal bleeding and extravasation of contrast agent.

Even when there is no evidence of abdominal aorta aneurysm in patients with ankylosis who present with hypotension, traumatic aortic injury caused by spinal fracture should be ruled out.

Bibliography

1. Savolaine E.R., Ebraheim N.A., Stitgen S., et al.: Aortic rupture complicating a fracture of an ankylosed thoracic spine: a case report. *Clin Orthop Relat Res*, 1991, 272: 136-140.
2. Schaberg J.: Aortic injury occurring after minor trauma in ankylosing spondylitis. *J Vasc Surg*, 1986, 4: 410-411.
3. Wang Y.F., Teng M.M.H., Chang C.Y., et al.: Imaging manifestation of spinal fractures in ankylosing spondylitis. *AJNR*, 2005, 26: 2067-2076.
4. Westerveld L.A., Verlaan J.J., Oner F.C.: Spinal fractures in patients with ankylosing spinal disorders: a systematic review of the literature on treatment, neurological status and complications. *Eur Spine J*, 2009, 18: 145-156.