

Risk of Aortic Rupture by Displaced Vertebral Bone Fragment Following Spinal Trauma: A Case Report with Review of the Literature

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Abstract

Case Report

Spinal injuries represent a diagnostic and therapeutic emergency that interest especially the young and active population, they present a great risk of instability and neurological disorders involving the vital and functional prognosis, we present a case of a patient aged 30 years, admitted to the emergency room for trauma of the dorsolumbar spine, the CT scan of the spine objective an unusual displacement of a sharp fragment of the vertebral body L1 putting at risk the abdominal aorta under renal.

Keywords: Emergency, vertebral fracture, abdominal aorta, nerve damage, vascular damage, osteosynthesis.

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INTRODUCTION

Fractures of the thoraco-lumbar region are among the most common fractures of the spine. The average frequency of neurological disorders, regardless of severity, is approximately 20%. Most often, high-energy fractures with neurological disorders affect young patients and can have disastrous socioeconomic consequences. Treatment will be guided primarily by the criteria of neurological impairment, mechanical instability and sagittal deformity (kyphosis). We report a rare clinical case of post-traumatic anterior displacement of a corporal vertebral fragment with risk of aortic rupture [1, 2].

CASE REPORT

Patient aged 30 years with no notable history, victim of a fall of 6 meters with landing on the feet and who accused of lumbar pain, he was admitted to the emergency room with a sharp lumbar pain without particular radiations, the clinical examination found a conscious patient with a Glasgow score of 15/15, Hemodynamically stable with a blood pressure of 120/70 mmHg and a respiratory rate of 15 cycles/min,

pulse oxygen saturation of 99%, no sensory-motor deficits of the lower limbs on admission and in the hours that followed.

The biological work-up showed a B rhesus + blood grouping, a hemoglobin of 14 g /dl, a Prothrombin rate of 100%, the dorso-lumbosacral CT scan showed a wedge-shaped fracture with a horizontal line of the upper third of the vertebral body of L1 with detachment of the anterosuperior wedge whose lower edge comes into contact with the sub-renal abdominal aorta without a clearly individualizable parietal lesion, associated with a recoil of the posterior wall of L1 filling the anterior epidural space associated with a Fracture also of the left lateral lamina, of the left pedicle of the left transverse apophysis of L1 (Figure 1). The rest of the body scan was without abnormalities. The patient was scheduled for osteosynthesis of the L 1, surgery classified as high risk bleeding, requiring invasive monitoring, blood reserve, vascular surgeon advised by the risk of aortic rupture, The patient was admitted to the operating room, under general anesthesia, taking a central venous jugular line, radial arterial catheter, put in ventral decubitus, he received an osteosynthesis by minimally invasive technique with

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screwing of the displaced fragment (Figure 2). The postoperative period passed without incident, the post

operative period was simple.

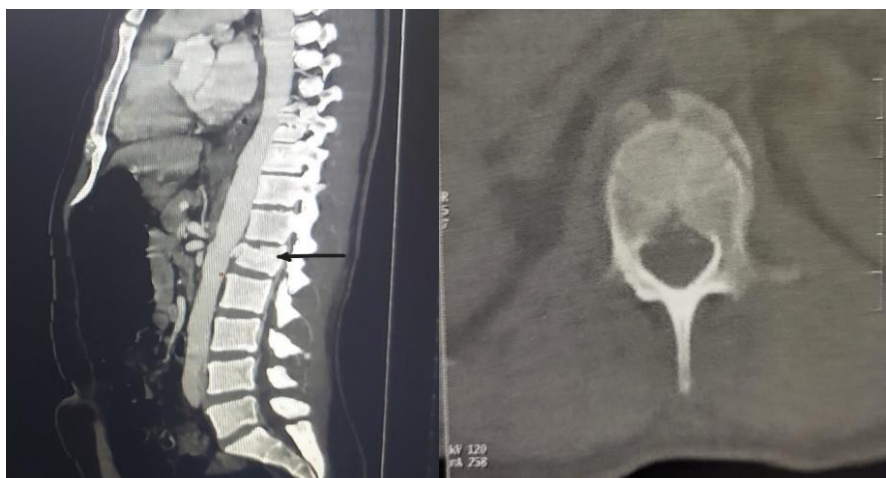


Figure 1: Sagittal CT-scan reconstruction of a horizontal wedge fracture of the upper third of the vertebral body of L1 with detachment of the anterosuperior corner whose inferior edge comes into contact with the sub-renal abdominal aorta

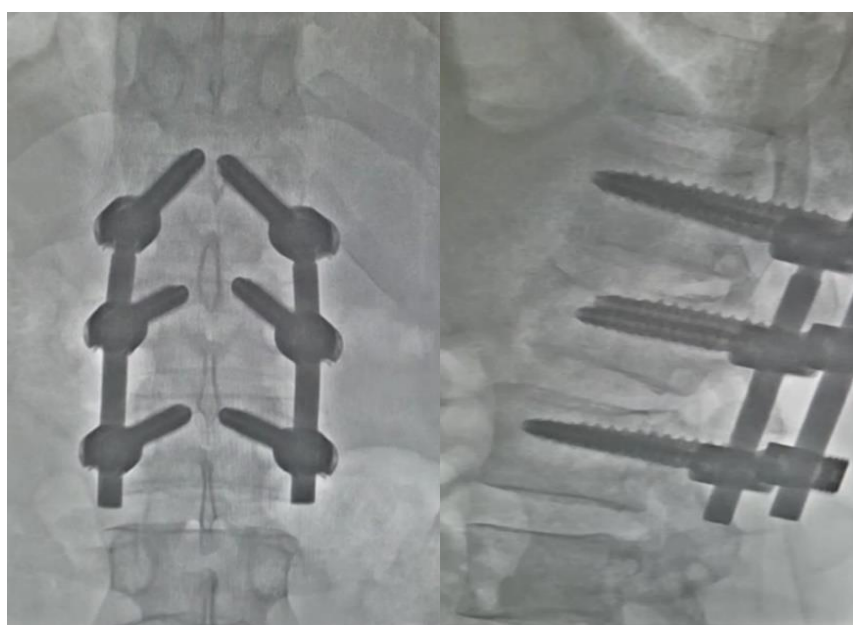


Figure 2: Standard X-ray image showing minimally invasive osteosynthesis with screwing of the displaced body fragment

DISCUSSION

There are two peaks in the incidence of spinal fractures: the first is around the age of 20-30 years and concerns mainly young subjects following road accidents or falls from height in 40-50% of cases; the second peak occurs after the age of 60 years and concerns rather women with bone demineralization [3].

At the scene of the accident, the management of these patients is crucial, the prognosis depends on the conditions of collection because 15% of secondary accidents occur in this stage, in fact it is necessary to consider any comatose trauma as fractured cervical spine and the collection must be done by immobilizing the entire spine and maintaining the axis head / neck /

trunk rigid according to the recommendations of the Advanced Trauma Life Support (ATLS) [4].

In the hospital, once the vital functions have been stabilized, a neurological examination is performed according to the criteria of the American Spinal Injury Association (ASIA) informing about the level of injury, the completeness or not, the motor skills, the sensitivity, the perineal sensitivity and the sphincter function, as well as their evolution in time. The spine can be radiologically explored. Very often, patients have already had a body scan. The CT-scan allows to detect the presence of possible corporal fractures, posterior wall recoil, intra canal disc and bone fragments, Magnetic resonance imaging (MRI) offers sagittal slices and provides high quality images of the spinal cord. However, the main, and probably the only,

indication for emergency MRI is spinal cord injury without detectable bone damage [5].

Once the morphology of the vertebral lesion(s) has been determined, the therapeutic decision takes into account the patient's age, vital functions, any associated thoracoabdominal lesions and neurological disorders. Most spinal injuries without neurological disorders are treated non-surgically. Most spinal injuries with neurological disorders are treated surgically, especially patients with partial and progressive neurological disorders. The timing of surgery for these patients is still controversial, but it is generally accepted that surgery should be performed within six hours of the trauma if the best chance of functional recovery is to be achieved [6]. At present, the routine use of corticosteroids has been abandoned [7].

The goals of surgical treatment are to decompress the spinal canal in cases of partial or progressive neurological disorders and to mechanically stabilize the spine. In cases of significant mechanical instability, fractures without neurological deficit may sometimes require surgical treatment, especially unstable fractures with secondary displacement. Our patient presents a corporal bone detachment endangering the subrenal abdominal aorta and an instability of the middle vertebral segment, in particular the posterior wall recession, which poses the surgical indication for osteoarticular fixation in order to avoid the risk of vascular and neurological damage

Many advances have been made in surgical techniques, including minimally invasive techniques that reduce operating time and soft tissue damage. The implantation of percutaneous pedicle screws, thus preserving the spinal musculature and reducing postoperative pain. The development of biologically active cements also makes it possible today to treat the vertebral body indirectly by percutaneous cementoplasty, a technique previously reserved for osteoporotic fractures in the elderly. However, this technique is not yet recognized as a standard for the treatment of non-porotic fractures and should only be applied in well-defined situations. These new surgical techniques reduce the risk of intraoperative bleeding,

thus facilitating the management of secondary spinal cord injuries of systemic origin (SSCAs) [8].

CONCLUSION

Spinal fractures of the thoracolumbar region are the most common. Fractures resulting from high-energy trauma affect a young and active population and are associated with neurological disorders in an average of 20% of cases. These patients are often polytraumatized and priority in their management is given to the stabilization of vital functions; surgical treatment is reserved for unstable fractures with risk of secondary displacement and neurological and vascular damage.

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