

Subacute Rare Complication in a Patient with Diffuse Idiopathic Skeletal Hyperostosis Accompanied by Minor Trauma-Induced Lumbar Fracture: A Large Abdominal Aortic Pseudoaneurysm

Masafumi Goto^{1,2)}, Masafumi Fukuda¹⁾, Nobuhisa Hirayu¹⁾, Masakazu Nabeta¹⁾,
Kimiaki Yokosuka²⁾, Norio Yamashita¹⁾ and Osamu Takasu¹⁾

1) *Advanced Emergency and Critical Care Center, Kurume University Hospital, Fukuoka, Japan*

2) *Department of Orthopaedic Surgery, Kurume University Hospital, Fukuoka, Japan*

Keywords:

abdominal aortic pseudoaneurysm, dislocation fracture of the lumbar vertebra, diffuse idiopathic skeletal hyperostosis, minor trauma, endovascular treatment

Spine Surg Relat Res 2025; 9(2): 263-265

dx.doi.org/10.22603/ssrr.2024-0195

Introduction

Aortic injury associated with vertebral fracture often results from high-energy trauma¹⁾. However, in older adults with underlying ankylosing spinal disorders (ASD), vertebral fracture can be caused by mild trauma, such as falls. Occasionally, concurrent aortic injury at the fracture site can occur^{2,3)}. In vertebral fracture patients with underlying ASD, the incidence of complications and the mortality rate are increased⁴⁾. We experienced a patient with diffuse idiopathic skeletal hyperostosis (DISH) who sustained a dislocation fracture of the fourth lumbar vertebra due to a fall and who developed a concurrent large abdominal aortic pseudoaneurysm. We presently report that aneurysmal rupture was avoided and that the patient's life could be saved by endovascular treatment.

age of the contrast medium was noted, and because of the slow progression of anemia, no clear active bleeding was observed. Postoperative CT revealed expansion of the hematoma (Fig. 2, 3). Hence, contrast-enhanced CT was repeated. A large hematoma (height×width×depth: 75 mm×150 mm×100 mm) was observed in the posterior part of the abdominal descending aorta 50 days after spinal surgery, with an influx of contrast medium into the hematoma from the aorta (Fig. 4). The patient was diagnosed with an abdominal aortic pseudoaneurysm. A stent-graft was inserted into the abdominal descending aorta 55 days after spinal surgery, and the influx of contrast medium into the aneurysm disappeared (Movie S1 and S2). After vascular surgery, the patient developed several complications, including bacteremia and heart failure, but was transferred to a rehabilitation hospital 5 months after injury.

Case Presentation

A 90-year-old woman presented with DISH and was referred to our hospital to undergo surgery for a dislocation fracture of the fourth lumbar vertebra associated with a fall (Fig. 1). As the dislocation could not be repositioned surgically, and considering that approximately 10 days had passed since the injury, the patient opted for posterior spinal fusion alone (Figure S1 and S2). Preoperative contrast-enhanced computed tomography (CT) revealed a hematoma in the retroperitoneal space. However, no extravascular leak-

Discussion

Reports of aortic pseudoaneurysms accompanying spinal fractures triggered by minor external injuries are extremely rare^{2,3,5)}. Furthermore, it is uncommon to find late-onset aortic pseudoaneurysms³⁾. Vertebral fractures in patients with ASD are highly unstable and readily dislocated^{6,7)}; therefore, there can be a high risk of aortic injury onset.

If a pseudoaneurysm has the potential to become life-threatening when ruptured⁸⁾, vascular surgery must be performed immediately after the diagnosis³⁾. Endovascular treat-

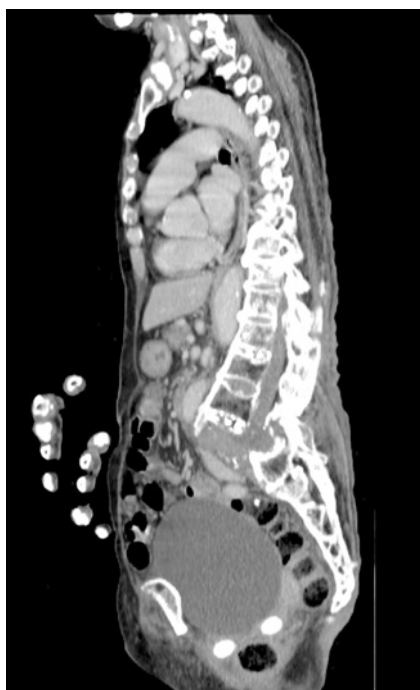


Figure 1. Ten days after the injury, contrast-enhanced CT, sagittal.

A dislocation fracture is observed in the fourth lumbar vertebra, with a bone spur situated adjacent to the aorta.

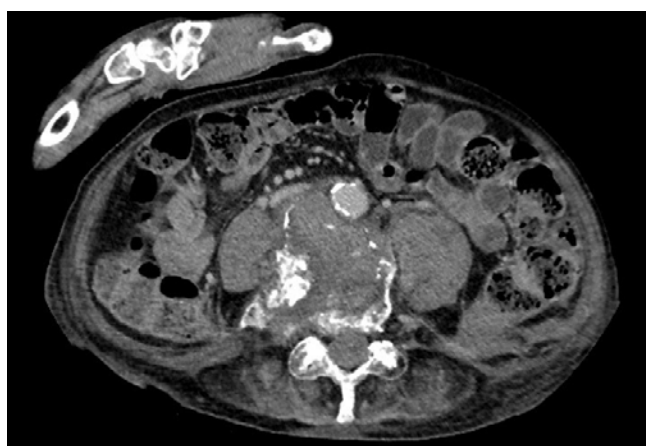


Figure 2. Ten days after the injury, contrast-enhanced CT, axial (fourth lumbar vertebra level).

A small hematoma is observed in the retroperitoneal space. No apparent extravascular leakage of the contrast medium is noted.

ment using a stent-graft has recently gaining popularity as the first choice of treatment from the perspective of minimal invasiveness and effectiveness^{9,10}. However, endovascular therapy can be challenging, depending on the location of the aneurysm³. In the present case, the injury site was at the lower lumbar vertebral level; therefore, the stent-graft could be placed without affecting the aortic branches.

In the present case, the slow formation of the pseudoaneurysm led to late diagnosis. It is conceivable that the mechanism underlying the slow formation of pseudoaneu-

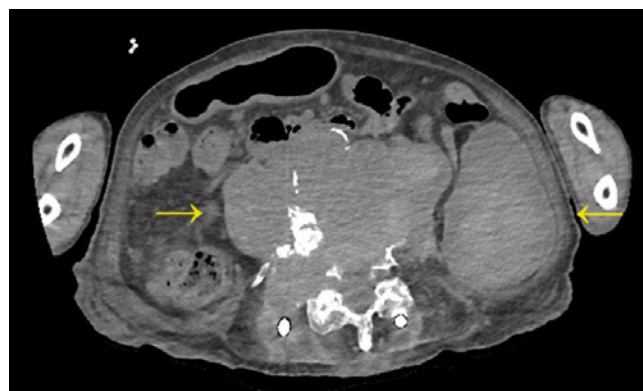


Figure 3. Sixty-one days after the injury, fifty days after the spinal surgery, simple CT, axial.

An expansion of the hematoma is observed in the retroperitoneal space (rightward yellow arrow). A new hematoma is also noted on the left side of the retroperitoneal space (leftward yellow arrow).

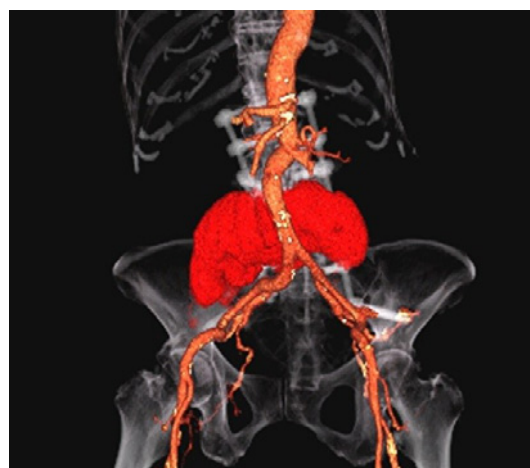


Figure 4. Sixty-one days after the injury, fifty days after the spinal surgery, contrast-enhanced CT, 3D angiography, frontal view.

A large (height×width×depth: 75 mm×150 mm×100 mm) aortic pseudoaneurysm is observed in the posterior part of the abdominal descending aorta. The position of the aneurysm corresponds to the dislocation fracture site in the lumbar vertebra.

rysm involves intimal injury caused by direct injury from osteophytes and/or blunt injury from excessive traction and distortion of the aorta associated with trauma. When treating spinal fracture from minor external injuries in patients with underlying ASD, spine surgeons should always consider the possibility of complicated aortic injury. Even during the initial consultation if contrast-enhanced CT does not reveal any obvious vascular damage, spine surgeons should consider repeating the procedure.

Conflicts of Interest: The authors declare that there are no relevant conflicts of interest.

Sources of Funding: None

Author Contributions:

Conceptualization: Masafumi Goto

Writing - original draft: Masafumi Goto, Masafumi Fukuda

Visualization: Masafumi Goto

Writing - review and editing: Osamu Takasu

All authors read and approved the final manuscript.

Ethical Approval: Ethical approval by the ethics committee was waived because this is a single case report.

Informed Consent: Informed consent for publication was obtained from the patient's family.

References

1. Neschis DG, Scalea TM, Flinn WR, et al. Blunt aortic injury. *N Engl J Med*. 2008;359(16):1708-16.
2. Lifshutz J, Lidar Z, Maiman D. Thoracic aortic pseudoaneurysm after spine trauma in ankylosing spondylitis: case report. *J Neurosurg Spine*. 2005;2(2):218-21.
3. Shoji H, Sawakami K, Tanaka Y, et al. Large aortic pseudoaneurysm after fusion surgery for hyperextension-type lumbar fracture

in diffuse idiopathic skeletal hyperostosis: illustrative case. *J Neurosurg Case Lessons*. 2022;4(5):CASE2281.

4. Westerveld LA, van Bommel JC, Dhert WJA, et al. Clinical outcome after traumatic spinal fractures in patients with ankylosing spinal disorders compared with control patients. *Spine J*. 2014;14(5):729-40.
5. Ishii H, Nakamura K, Nakamura E, et al. Aortic pseudoaneurysm due to simple vertebral compression fracture treated with conservative management. *Ann Vasc Dis*. 2016;9(4):349-51.
6. Lange U, Pape HC, Bastian L, et al. Operative management of cervical spine injuries in patients with Bechterew's disease. *Unfallchirurg*. 2005;108(1):63-8.
7. Surin VV. Fractures of the cervical spine in patients with ankylosing spondylitis. *Acta Orthop Scand*. 1980;51(1):79-84.
8. Parmley LF, Colonel L, Mattingly TW, et al. Non penetrating traumatic injury of the aorta. *Circulation*. 1958;17(6):1086-101.
9. Pang D, Hildebrand D, Bachoo P. Thoracic endovascular repair (TEVAR) versus open surgery for blunt traumatic thoracic aortic injury. *Cochrane Database Syst Rev*. 2019;2(2):CD006642.
10. Harky A, Bleetman D, Chan JSK, et al. A systematic review and meta-analysis of endovascular versus open surgical repair for the traumatic ruptured thoracic aorta. *J Vasc Surg*. 2020;71(1):270-82.

Spine Surgery and Related Research is an Open Access journal distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view the details of this license, please visit (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).