



Vertebral fracture following prone positioning in acute respiratory distress syndrome

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To the Editor,

A 61-yr-old man who consented to this report was admitted to the intensive care unit after pulmonary endarterectomy for chronic thromboembolic pulmonary hypertension. His medical history included obesity (body mass index, 32 kg·m⁻²), hypertension, diabetes mellitus, and vertebral osteoarthritis. He developed pneumonia followed by acute respiratory distress syndrome requiring five sessions of prone positioning. Routine assessment of the spine on a thoracic computed tomography (CT) scan performed five days later showed a recent T12 body fracture (Figure, panel A). There was no pyramidal syndrome. Only the semi-recumbent position with no more than 30° inclination, in-line mobilization, and prone positioning if necessary were allowed. Surgery was not deemed indicated. Re-examination of the preoperative CT scan showed spinal ankylosis consistent with diffuse idiopathic skeletal hyperostosis (Figure, panel B).

A single further prone position session was necessary. A CT scan performed six days later showed that the T12 fracture was stable (Figure, panel C), and magnetic resonance imaging of the spine confirmed the recent nature of the fracture. Thirty-five days after the diagnosis, a CT scan showed ossification of the anterior longitudinal ligament between the two vertebral body fragments,

simulating a bone callus. The patient was released from all restrictions.

Prone positioning is an essential component of the management of severe acute respiratory distress syndrome.^{1,2} Among reported complications, the most worrying are accidental extubation, mainstem bronchus intubation, oxygen desaturation, hemoptysis, cardiac arrest and hemodynamic failure, loss of vascular access, and pressure ulcers.^{1,2} To our best knowledge, vertebral fracture has not been described.

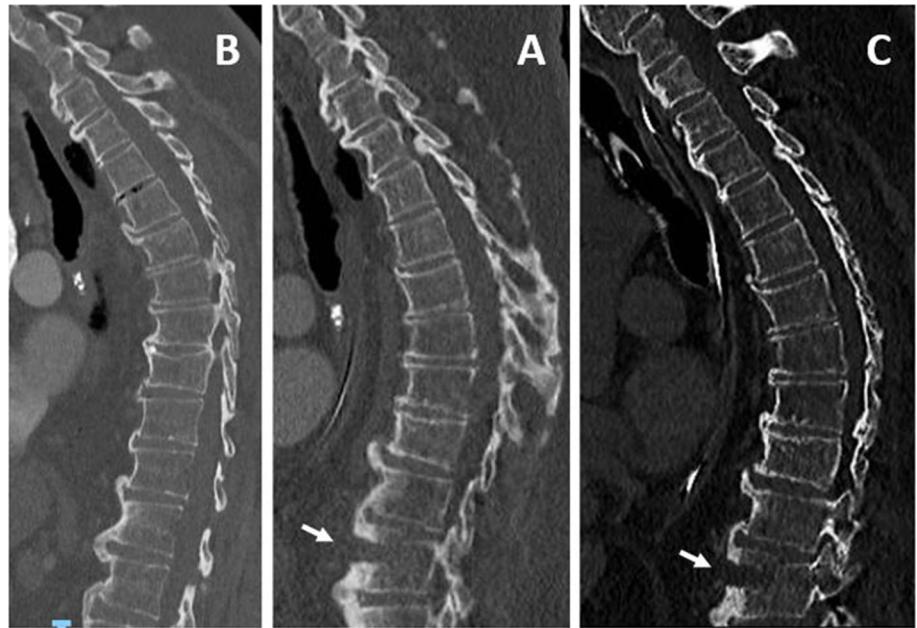
Diffuse idiopathic skeletal hyperostosis (DISH) is common (incidence 19.5%,³ and up to 42.0% in some populations⁴) but underdiagnosed. Risk factors comprise male sex, older age, hypertension, diabetes mellitus, obesity, metabolic syndrome, and hyperuricemia.^{3,4} Spinal ankylosis is associated with an increased fracture risk even after trivial trauma, with extension being the most common mechanism.⁵ Such fractures usually involve the cervical and thoracic level and tend to be unstable.⁵

The practical implication of this case is that DISH must be considered in patients with risk factors. Physicians must be alert to possible spinal cord injury during prone positioning in such patients. Although prone positioning does not seem contraindicated because of spinal ankylosis, in cases where a diagnosis of DISH is confirmed, spinal hyperextension must be avoided during the turning procedure. Assessments for new-onset pain and neurologic function should be undertaken as promptly and as frequently as possible. When a fracture is diagnosed, its stability must be assessed carefully before initiating another prone position session. In case of spinal instability, percutaneous stabilization of the fracture is mandatory. Such fractures begin to heal after five weeks.

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FIGURE Vertebral fracture following prone positioning in acute respiratory distress syndrome. (A) Computed tomography (CT) image showing a T12 body fracture. The antero-superior part of the vertebral body is torn upward by the osteophyte. The neural arch is intact. (B) A prior preoperative CT scan shows spinal ankylosis. (C) CT image showing stability of the fracture gap. The posterior arch is still intact after a new prone position session.



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