



Case Review

A 47-Year-Old Man With a Spinal Cord Injury After a Parachute Jump



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A 47-year-old man was participating in a parachute demonstration when he became tangled with another member of the demonstration team and suffered a free fall of approximately 20 to 25 feet. On the initial jump, the patient's parachute deployed without incident. Unfortunately, however, the chute opened immediately before landing and tangled with another team member. The patient sustained a direct fall, landing feet first on a grass field. Subsequently, he then fell backwards. Ground emergency medical services were on-site for the event and immediately assessed the patient. He was unable to ambulate and complained of left foot pain and back pain. He was wearing a helmet and denied loss of consciousness. The patient initially had a blood pressure of 147/87, heart rate of 83, and an oxygen saturation of 98% on room air.

Once assessed, the patient had a cervical collar placed, and he was secured to a backboard. He received several doses of fentanyl for pain. He remained hemodynamically stable without additional complaints and was taken to the closest level III trauma center for further evaluation without incident.

On arrival, the provider assessed his critical systems, and they were not altered. However, during the neurologic examination, he was noted to be able to dorsiflex and plantarflex without compromise of his strength in the right lower extremity but was unable to raise his right leg off the bed. On the left lower extremity, the patient had a deformity to the ankle, and he had no movement to the left lower extremity. The left foot had no palpable dorsalis pedis or posterior tibial pulse, and the toes were dusky. His bilateral upper extremities were

unaffected without any sensory or strength deficits. He had no evidence of any further trauma to his head or torso. He had no lumbar spine tenderness with no palpable deformity and decreased rectal tone.

As part of the trauma evaluation, the patient had a chest radiograph that revealed no acute abnormalities and x-rays of his left ankle and foot (Fig. 1). Additional radiographs showed a medial subtalar dislocation with a suspected medial malleolus fracture and multiple left foot fractures. Given the concern for vascular compromise, the patient was emergently sedated with midazolam and ketamine and underwent closed reduction of the ankle. The duskeness resolved, and pulses in the left foot were restored after the reduction. Additionally, because of the mechanism of injury, the patient underwent a computed tomographic (CT) scan and was found to have a fracture with distraction of L1-L2 with severe comminuted compression deformity and retropulsion of fragments of L2 into the central canal causing severe central canal stenosis (Fig. 2).

With the emergent findings on the CT scan, an immediate neurosurgical evaluation at a level I trauma center and time-dependent transfer for operative intervention were required. The patient was transferred via helicopter. Vital signs and neurologic examination remained stable before and after transfer. He received additional analgesia en route.

On arrival to the level I trauma center, the patient was evaluated by staff from orthopedics and neurosurgery. He was taken emergently to the operating room where he received a T12-L4 posterior fixation/fusion with L1-L3 decompression. He was then admitted to the surgical intensive

care unit. Over the next 2 weeks, the patient had improvement in his bilateral lower extremity weakness. He had an open reduction and internal fixation of the left foot and ankle. He was discharged to a rehabilitation facility. On outpatient follow-up, the patient is now able to ambulate independently with some residual weakness requiring a cane.

Discussion

Falls From Height

This case illustrates the importance of early recognition, rapid treatment, and expeditious transport of a patient with a significant fall from height. Critical care transport providers routinely encounter patients with injuries from falls during all phases of transfer, from initial scene management to transferring patients in an interfacility environment. Staff should be familiar with the special considerations of this specific mechanism of injury and the management of spinal cord injuries (SCIs).

Injury Overview

Similar to motor vehicle crashes, falls from height cause injury through an abrupt deceleration injury. However, unlike motor vehicle crashes, which cause injury from horizontal deceleration, falls cause injury from vertical deceleration.¹ The median height of falls in patients who died is 15 meters (approximately 49 feet).² Although patients who fall from greater heights are at greater risk for serious injury, falls from shorter heights can also lead to serious injury depending on the presenting surface and underlying patient comorbidities.

The portion of the body that strikes the ground first is another predictor of serious injury. Although skeletal injuries

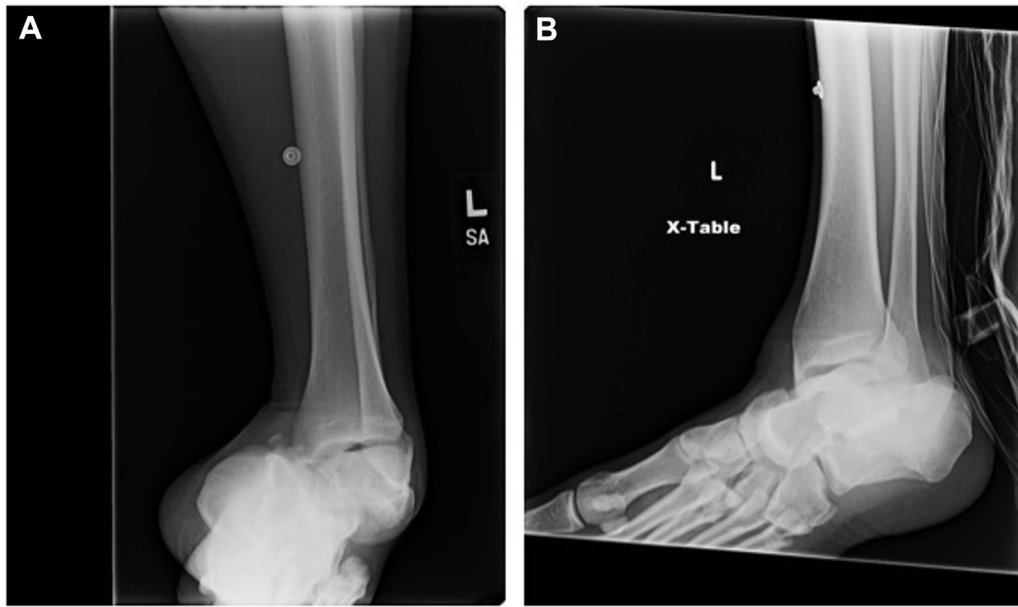


Figure 1. (A) A radiograph of the left ankle revealing a medial subtalar dislocation and multiple foot fractures including a medial malleolus fracture. (B) A radiograph of the left ankle revealing a medial subtalar dislocation and multiple foot fractures including a medial malleolus fracture.

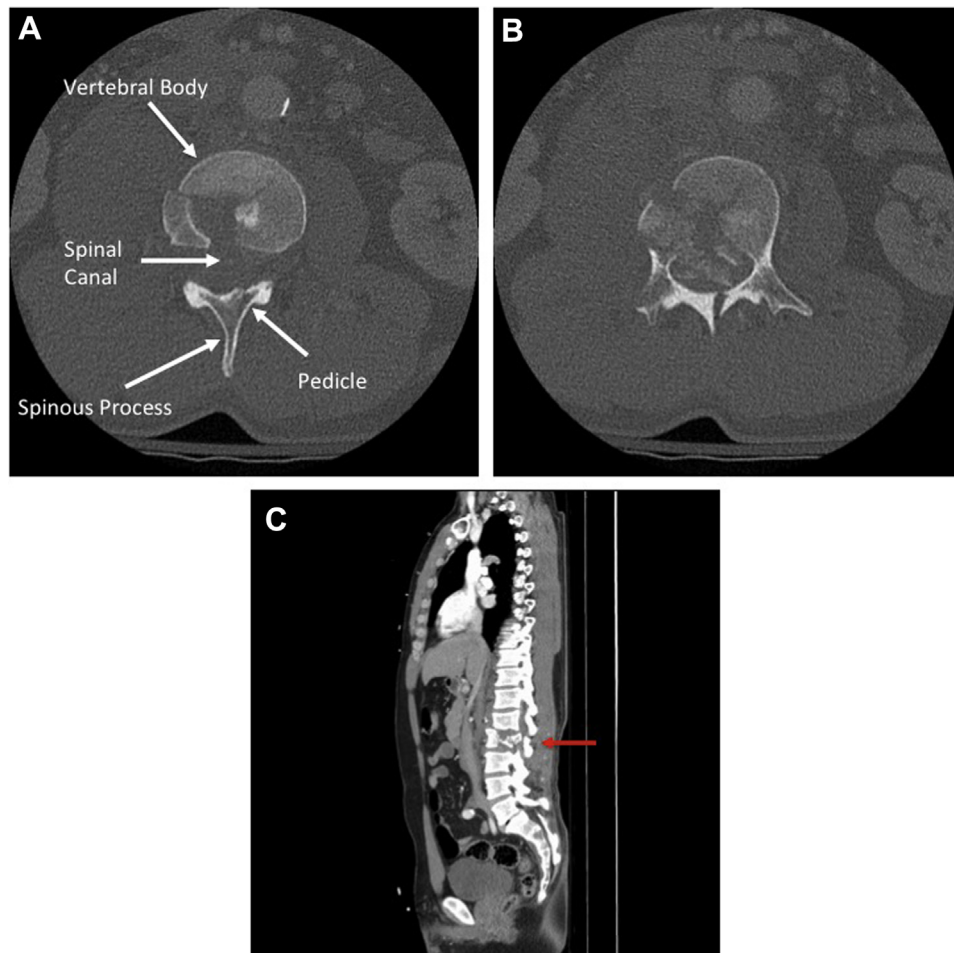


Figure 2. (A) A CT scan of the lumbar spine revealing fractures of L1 and L2 with severe comminuted compression deformity and retropulsion of fragments of L2 into the central canal. (B) A CT scan of the lumbar spine revealing fractures of L1 and L2 with severe comminuted compression deformity and retropulsion of fragments of L2 into the central canal. (C) A CT scan of the lumbar spine revealing fractures of L1 and L2 with severe comminuted compression deformity and retropulsion of fragments of L2 into the central canal.

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