

Lumbar Compression Fracture

Patrick Graham

Introduction

Back pain is a common complaint in the adult population. An estimated 1.5 million vertebral compression fractures (VCFs), the most common type of fracture secondary to osteoporosis, occur in the United States every year, with annual expenditures estimated to exceed \$1 billion. These fractures have the potential to cause significant disability, with some patients experiencing disfigurement and height loss, and, in rare cases, leading to the development of chronic pain. Those with significantly impaired functional status are also at an increased risk for further complications such as pressure sores and pneumonia. Patients with an acute VCF most commonly report abrupt onset of back pain, with or without trauma, which is worsened with position changes or activities that increase abdominal pressure such as coughing, sneezing, or lifting. The majority of patients can be treated successfully, defined as the ability to return to previous level of function, with conservative management (Alexandru & So, 2012; Goldstein et al., 2015; Kim et al., 2003; McCarthy & Davis, 2016).

Case Presentation

A 47-year-old man presented to the emergency department (ED) with acute back pain secondary to a fall. He was walking alongside a ravine, slipped on loose gravel, fell approximately 4–5 ft into the ravine, ultimately landing on his left buttocks and falling backward onto his back. He noted immediate onset of low back pain. After a few minutes, he was able to ambulate independently but noted continued severe back pain that brought him into the ED. He denied any lower extremity weakness, numbness, or tingling. He denied saddle anesthesia.

Upon presentation was an alert, oriented, affected-appropriate male in no apparent distress. There were several small abrasions about the low back but no gross deformity. He was notably tender midline, overlying L2. The surrounding paraspinal region was also tender, but to a lesser degree, with mild edema. Bilateral lower extremity strength was 5/5, with lumbar pain noted on resisted hip flexion. He was otherwise found to be distally neurovascularly intact, with negative straight leg raise, clonus, and Babinski reflex.

Management

Following administration of pain medication, the patient was sent for computed tomography (CT) of the

lumbosacral spine. This was significant for an L2 VCF (see Figure 1). The remainder of the lumbar spine was without acute pathology. The patient was fitted for a thoracolumbosacral orthosis (TLSO), and repeat radiographs were taken, demonstrating a stable compression fracture with normal anatomic alignment of the lumbar spine. The patient was discharged with instructions to follow up in the clinic the next week.

At 1-week follow-up, he noted a 40%–50% reduction in low back pain, managed with acetaminophen and icing a couple times a day. He had been compliant with the TLSO. He denied any changes in lower extremity strength, incoordination, or clumsiness of gait. He denied numbness or tingling in the lower extremities or perineal area. His examination demonstrated improved tenderness of the lumbar spine. His strength was 5/5 in bilateral lower extremities, with sensation intact in all distributions. He had palpable distal pulses. Repeat anteroposterior and lateral lumbar radiographs were taken, which demonstrated a stable L2 compression fracture and overall alignment of the lumbar spine (see Figure 2). He was given instruction to continue donning the TLSO, walk as tolerated, and follow up in 2 weeks.

Upon return visit, now 1 month from injury, he noted 80% reduction in pain. He was requiring medication only intermittently and was mobilizing without issue, reported as walking his dog for about a mile twice daily, among other day-to-day tasks such as grocery shopping and cleaning. He continued to be compliant with the TLSO. He denied any changes in the lower extremities, including numbness, tingling, weakness, or incoordination. Follow-up examination demonstrated no tenderness of the lumbar spine and 5/5 strength in bilateral lower extremities, which were again found to be neurovascularly intact. Repeat anteroposterior and lateral lumbar radiographs were taken and demonstrated continued stability of the L2 compression fracture and overall alignment of the lumbar spine (see Figure 3). It was recommended that he continue with the TLSO and have another follow-up in 1 month's time. With continued improvement at the next follow-up visit, the

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FIGURE 1. Sagittal and coronal computed tomographic scans. The arrow denotes site of wedge-type compression deformity of L2. The remainder of the lumbar vertebra are without acute findings.

advanced practice provider can anticipate starting the process to wean the TLSO and initiate a course of physical therapy for functional exercises, including core strengthening and lifting cues.

Discussion

A common cause of back pain in the adult population, VCFs should be considered in the differential for patients presenting with back pain of any duration. The suspicion for compression fracture should be heightened in those patients with a history of osteoporosis or if reporting a fall, notably with a mechanism consistent with axial loading or hyperflexion of the spine. Focal tenderness is the most common clinical finding and should direct the clinician to proceed with imaging. Radiographs, although pertinent in the acute setting, are commonly obtained but may be insufficient for evaluation. Computed tomography is more sensitive and reliable for the diagnosis and morphological description of VCFs as well as ruling out any associated osseous pathology. A majority of patients continue to be treated successfully with conservative management, the mainstays of which are bracing, activity modification, and multimodal pain management. Although several institutions offer clinical guidelines, there is significant

variance in diagnostic and therapeutic recommendations. It is of more importance for the advanced practice provider to understand the various treatment options, tailoring the prescribed plan of care to the specific patient, than to adhere to any one clinical algorithm (see Alexandru & So, 2012; Goldstein et al., 2015; Kim et al., 2003; McCarthy & Davis, 2016; Parreira et al., 2017).

Associated retropulsion has the potential to cause nerve compression; thus, any patient with neurological findings should be immediately referred to an orthopaedic spine specialist so that necessary intervention is not delayed. In follow-up, the advanced practice provider should be attuned to worrisome radiographic signs of progress of vertebral height loss as well as patient with continued pain, worsening neurological status, or typically those symptoms that are described as impairing the patient's function despite appropriate conservative management. These patients should also be referred to the orthopaedic spine specialist for consultation. The option of vertebroplasty versus kyphoplasty is still a topic of debate in the literature, with several studies finding no statistical difference in functional outcomes, rates of complications, or adjacent level fracture between the two modalities. There is a need for further prospective trials to ascertain the long-term implications of these interventions versus conservative management alone (Bonaldi &



FIGURE 2. One-week follow-up, lateral lumbar radiograph. The arrow denotes site of L2 compression fracture. This is overall stable as compared with the previous measurements on the computed tomography scan. Normal lumbar alignment is maintained.



FIGURE 3. One-month follow-up, lateral lumbar radiograph. The arrow denotes site of L2 compression fracture. This too is overall stable as compared with previous radiographs and computed tomography scans. Lumbar alignment is maintained.

Cianfoni, 2012; Boonen et al., 2011; Epstein, 2019; Savage et al., 2014; Zhang et al., 2017).

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