Burst fractures of lumbar vertebrae are uncommon. This is a case report about a 19 years old girl who was injured from a height of ten meters suffering from low back and right heel pain, operated L4 vertebra burst fracture. The selection of the method of management for the patient suffering from acute thoracolumbar spinal trauma is controversial(1). The surgical method chosen depends on the type of fracture, anatomic and biomechanical factors and experience of the surgeon. The primary indication for anterior decompression and grafting is narrowing of the spinal canal with neurologic deficit which can not be resolved by any other approach. Additional indications are seen in patients with vertebral body fracture with complete comminution and dislocation, noncorrectable burst fracture(1,2). Low lumbar burst fractures are rare in literature(3). Our purpose is to describe the management of a burst fracture which causes severe spinal canal constriction at the level of lumbar fourth vertebra by an anterior approach, performing corpectomy, cage application with grafting and screw-rod instrumentation.

Case Report

A 19-year-old female fall from ten meters height and she was suffering from low back pain and right heel pain when admitted to our hospital’s emergency unit with this complaints. Her physical examination revealed no motor or sensory deficit in her bilateral lower extremities. Deep tendon reflexes were evaluated 2+ (normoreactive). She had right heel pain and this was something which limited the quality of the...
motor evaluation of her right lower extremity. She had no bladder or bowel dysfunction. X-rays of the right foot and lumbosacral region were obtained at the emergency unit and they revealed; loss of body height and widening of the pedicles of L4 vertebra in the AP view (figure 1), loss of anterior body height, anterior comminution and segmental kyphosis in lateral view of L4 vertebra (figure 2). Displaced calcaneal fracture was seen in the lateral radiograph of her right foot. Computed tomography of lumbosacral region was obtained to evaluate the status of the spinal canal at that level and it revealed; multiple fracture lines and comminution at lumbar fourth vertebra and spinal canal narrowing because of a retropulsed and displaced fragment (figure 3). There was also a laminar fracture and this finding suggests a complete burst fracture. The patient was reassessed for the presence of a neurological deficit but there was not any difference in her neurologic status when compared to the initial examination. An operation was planned and performed two days after the initial injury to ensure the optimal condition. Her neurologic findings remain normal during this period. We performed transabdominal retroperitoneal approach from the left side, giving the patient right lateral decubit position. Corpectomy was performed to L4 vertebra and also the retropulsed fragment and disc material were removed from the spinal canal (figure 4). Posterior longitudinal ligament was completely ruptured but it was not repaired. A titanium cage filled with allograft cancellous bone chips was placed to the space between L3-L5 vertebra and finally L3 and L5 vertebra were connected with a rod and screw combination (figure 5). The tissue plan were closed anatomically after the application of a suction drainage tube into the operative field and operation was finished. There were no neurologic complications during the intraoperative or postoperative period. The patient was mobilized with crutches and thoracolumbosacral orthosis two days later. We performed open reduction and internal fixation for the right calcaneus fracture one week later and she was discarded from our clinic four days after the second operation without any neurologic or wound complications.

Discussion

Burst fractures of lumbar fourth and lumbar fifth vertebrae are uncommon (3). Criteria for choosing operative or non operative techniques for the treatment of thoracolumbar burst fractures remain controversial especially in neurologically intact patients (1). Treatment of choice for burst fracture are nonsurgical (4) or surgical either posterior stabilization (5,6) or by using an anterior approach (7). Indication for stabilization in the absence of neurologic deficit for a low burst fracture is % 50 canal compromise in conjunction with loss of height and local kyphosis (8). According to Bradford; loss of vertebral body height, % 60 to % 70 canal stenosis and an angular deformity of 30-40 degrees are surgical indications for burst fractures (2). Surgery by an anterior approach can be performed for low burst fractures with or without neurologic deficit if vertebral compression or canal encroachment is at least % 40 or kyphosis is greater than 15 degrees (1). If the clearance of the canal is essential, anterior decompression is the treatment of choice (9). We performed anterior decompression to our patient because spinal canal compromise was % 70, although no neurologic deficit was evident. Biomechanical and anatomical characteristics of lower lumbar spine differ from those of the thoracolumbar region and they may account for the inherent stability of these injuries. If surgery is chosen, using a long distraction instrument should be avoided in the lower lumbar spine (10). We didn’t perform posterior approach and distraction rod because posterior longitudinal ligament was disrupted and also there was a fractured lamina. We believed that if posterior stabilization using distraction rods was performed to our patient, retropulsed fragments would move further into the canal and cause iatrogenic cauda equina syndrome. In our patient, lamina fracture of lumbar fourth vertebra was diagnosed by computed tomography. She was lucky to be saved from cauda equina entrapment. She had no neurologic abnormality related with cauda equina.
**Figure 1:** Loss of body height and widening of the pedicles of L4 vertebra in the AP view

**Figure 2:** Loss of anterior body height, anterior comminution and segmental kyphosis in lateral view of L4 vertebra

**Figure 3:** Preoperative computed tomography show that the spinal canal narrowing and the laminar fracture

**Figure 4:** Postoperative computed tomography show that the spinal canal decompression after operation

**Figure 5:** Post operative X-rays of L4 vertebra
**Conclusion**

If spinal canal compromise is greater than % 70 which may indicate a risk of future displacement which may cause neural injury, anterior decompression and stabilization should be performed for lower lumbar burst fractures even if there is no neurologic deficit. This approach has advantages of obtaining anatomical reduction and rigid stability and also it enables the patient to start rehabilitation and to return to work earlier.
References


