CASE REPORT

W.-C. Chen

Complete fracture-dislocation of the lumbar spine without paraplegia

Accepted: 11 November 1999

Abstract A case of fracture-dislocation of the lumbar spine with complete anterior dislocation of L4 without any neurological deficit.

Résumé Un cas de traumatisme lombaire avec dislocation complete de L4-L5 sans deficits neurologique.

Introduction

Hyperextensive type fracture-dislocation of the lumbar spine accounts for less than 3% of all spinal injuries [1, 2, 4]. This type of fracture is always associated with a high incidence of neurological deficit of the lower extremities [4].

Case report

A 25-year-old male motorcyclist was involved in a traffic accident in which he was hit by a truck. He was immediately transferred to the emergency department. Physical examination showed stable vital signs, no head injury, a painful back with huge contusional abrasion wounding and marked concave deformity of the lower lumbar area, painful deformity of his right arm and a deep lacerating wound over the right perineal area measuring about 10 cm. Although there were multiple abrasions over his right leg and ankle, no definite motor or sensory change to either the lower extremities or the right upper extremity were noted. Anal tone was intact. Initial radiographs showed complete fracture-dislocation of L4 and L5 with corresponding fractures of these transverse processes (Fig. 1). Computed tomography revealed complete anterior displacement of the L4 vertebral body with fracture of the transverse processes of L4 and L5 (Fig. 2). Under general anesthesia, the patient was placed in a prone position and gentle closed reduction of lumbar spine by pelvic traction was done. Posterior instrumentation was undertaken on L3 and L5 resulting in good reduction and return of the lordotic curve (Fig. 3). On the fourth post-operative day, the patient

could ambulate with a Taylor brace. Myelography on the tenth post-operative day revealed intact dura with complete patency of the spinal canal (Fig. 4).

Discussion

There have been many reports on fracture-dislocation of the lumbar spine in recent years [2-4, 7]. Hyperextension as a mechanism for fracture-dislocation in the thoraco-lumbar spine was first described by Holdsworth [1, 2, 4]. De Oliverira [5] reported an unusual pattern of sagittal shear fracture-dislocation secondary to posterior impact injuries. Hyperextension injuries result in the disruption of all ligaments and supporting elements of the spine starting with the anterior column [4, 6]. Sagittal translation and comminution of the posterior elements are the most common radiographic findings [4]. Computed tomography can accurately demonstrate the destruction of the posterior elements, and magnetic resonance imaging is able to demonstrate the anterior ligamentous disruption. Nearly all cases suffer from paraplegia known as lumberjack paraplegia or severe neurological deficit. Denis [4] reported 12 cases of lumberjack paraplegia. Freeman [6] reported one case of shear fracture-dislocation of the L2-L3 level without paraplegia, but that case was not a frank dislocation of the vertebral body such as in our patient. This case with a miraculous outcome had a complete anterior dislocation of his L4 vertebral body without any neurological deficit from pre-operative Frankel E condition to post-operative Frankel E condition. Thus, the tolerance of nerve injury is still unknown. Often involving all three columns in hyperextension injuries of the lumbar spine, these ligamentous structures are usually highly unstable. Treatment with posterior instrumentation with C-D or Trifix RF spinal system and fusion is the preferred method [4].

W.-C. Chen (✉)

Division of Orthopedics, Department of Surgery,
Far Eastern Memorial Hospital, 21, Nan-Ya S. Road, Sec. 2,
Pan-Chiao, Taipei, Taiwan, R. O. C

Fig. 1 Complete anterior fracture-dislocation of L4 and L5

Fig. 2 Double sun appearance on computerized tomography scan of lumbar spine

Fig. 3 Good post-operative lumbar lordotic curve

Fig. 4 Complete patency of the myelogram of lumbar spine on the patient's tenth post-operative day

References

1. Burke DC (1971) Hyperextension injuries of the spine. *J Bone Joint Surg [Br]* 53:3–12
2. Denis F (1983) The three column spine and its significance in the classification of acute thoraco-lumbar spine injury. *Spine* 8:817–831
3. Denis F (1984) Spinal instability as defined by the three column spine concept in acute spinal trauma. *Clin Orthop* 189:65–76
4. Denis F, Burkus JK (1992) Shear fracture-dislocation of the thoracic and lumbar spine associated with forceful hyperextension (lumberjack paraplegia). *Spine* 17:156–161
5. De Oliverira JC (1978) A new type of fracture-dislocation of the thoracolumbar spine. *J Bone Joint Surg [Am]* 60:481–488
6. Freeman BJC, Bisbinas I, Nelson IW (1997) Shear fracture-dislocation of the lumbar spine without paraplegia. *Injury* 28:563–564
7. Sasso RC, Cotler HB (1993) Posterior instrumentation and fusion for unstable fractures and fracture-dislocation of the thoracic and lumbar spine. A comparative study of the three fixation devices in 70 patients. *Spine* 18:450–460
8. Van Savage JG, Dahners LE, Renner JB, Baker CC (1992) Fracture-dislocation of the lumbosacral spine: case report and review of the literature. *J Trauma* 33:779–784