The Management of Fracture Dislocation of the Thoracic Spine

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Translational fracture-dislocation of the thoracic spine is rare and commonly associated with spinal cord injury. Opinions differ whether to treat such patients conservatively or operatively.

We present a case of a young male who sustained a translational thoracic spine fracture dislocation with a neurological injury, a lumbar spine fracture and a soft tissue perianal injury, which was treated operatively. We believe such injuries should be treated operatively for early rehabilitation.

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There are many aspects to the thoracic spine, anatomy, biomechanics, and stability provided by the rib cage[1-3]. Fracture-dislocation of the thoracic spine is a serious injury and is commonly associated with spinal cord injury. Only 16 cases of such injury were reported with or without neurological injury, making surgical interference a challenge with uncertain neurological recovery[4-6].

The aim of this report is to present a case of fracture-dislocation of the thoracic spine with a management dilemma of whether to manage conservatively or surgically.

THE CASE

A nineteen-year-old male who had been involved in a MVA; he was unrestrained driver at high speed was referred to our hospital. He was first admitted to another hospital where he was resuscitated and intubated on arrival and diagnosed as fracture-dislocation T5-T6, L4 bust fracture, multiple rib fractures and perianal injury. He was labeled as paraplegic until proven otherwise. He was transferred to our institute four-days post-injury. CT scan showed a translation fracture dislocation at the T5-T6 vertical shear-like fracture pattern extending into the body of T7, T8, in addition to fracture L4 AO type A2, see figures 1-3. After two days of admission, the patient underwent posterior instrumentation T2-T12 with laminectomy T5-T6-T7. Intraoperatively, the dural sac was intact and pulsation of the spinal cord could be observed after decompression, see figure 4. L3-L5 posterior instrumentation was performed. Local and allograft were added at both injury levels. General surgeons explored his perianal wound and decided to perform a colostomy and use a Vacuum-Assisted Closure machine on the wound. He was extubated on the sixth postoperative day. Neurological examination revealed a neurological deficit level at T5. His postoperative X-ray showed acceptable alignment, see figures 5 and 6.

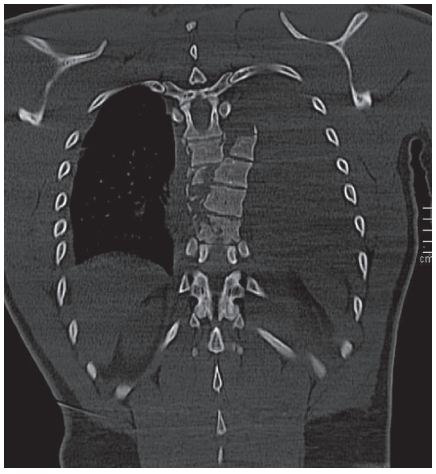

Figure 1: Coronal CT Scan Showed a Translational T5-T6 Thoracic Fracture Dislocation with Vertical Shear-like Fracture Involving T7, T8

Figure 2: Sagittal CT Scan Showed Vertical Fracture Pattern Extending to T7, T8

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Figure 3: Sagittal CT Cuts Showing Fracture L4

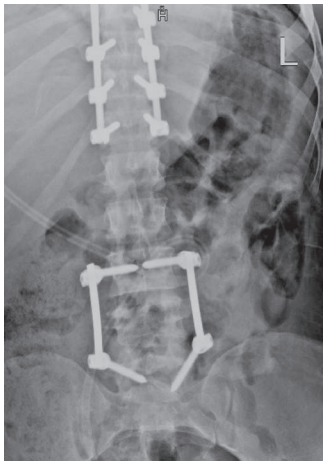

Figure 6: Postoperative Lumbar Spine Fixation

Figure 4: Intraoperative, the Laminectomy of T5-T7 with Intact Dural Sac

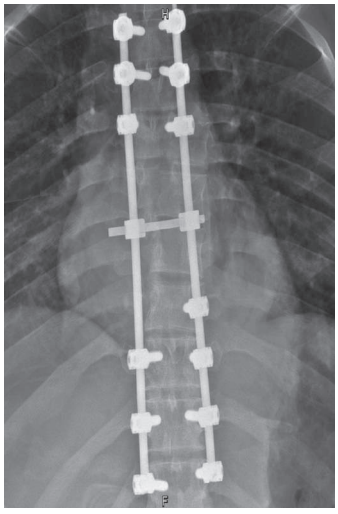

Figure 5: Postoperative Thoracic Spine Instrumentation

DISCUSSION

Our patient posed a dilemma for us of whether he had any neural injury and if so, what should be the ideal management? Such case is usually managed either conservatively or operatively. We opted for surgical interference only to discover later that he had severe spinal cord injury, making him paraplegic. In this scenario, our decision for surgical fixation was favorable for early rehabilitation.

Thoracic spine fracture-dislocation is a serious injury due to its unique anatomy and mechanics. Furthermore, the rib cage plays an important role in providing additional stability to the thoracic spine[1]. Depending on the mechanism of injury, a translational, rotational or anterior-posterior dislocation may occur[1].

Roaf found that pure hyperflexion or hyperextension is not sufficient to rupture spinal ligaments and it is actually the rotation combined with shear forces which could lead to displacement or subluxation without rupturing the anterior longitudinal ligaments[2]. White et al in spine biomechanics proposed the concept of spine stability in physiologic state[3].

There are a few cases reported of lateral thoracic spine fracture-dislocation with or without neurological injury; almost all cases share a constant radiological finding of pedicle fractures with vertical shearing fracture of the middle column that might extend either proximal or distal to dislocation level[4]. Out of these, 40% were treated non-surgically[4].

Researchers have proposed anatomical explanations for the neurological sparing based on the mechanism of injury. However, since then, no effort has been made to classify thoracic spine dislocation[5-7]. It is difficult to decide whether a fracture-dislocation in the thoracic spine is unstable and requires surgical fixation. A recent review highlighted the issues related to thoracic spine fractures and dislocations, and the ribcage as a fourth column which provides stability and integrity for the thoracic spine suggesting, if intact, surgical interference may not be needed[8-10]. Although different treatment approaches were used to manage translational thoracic spine fracture-dislocation (conservative versus surgical), still no clear indications for surgical stabilization are advocated. In our patient, the thoracic cage had multiple rib fractures; hence, we treated this as an unstable fracture requiring surgical fixation.

Spine stabilization reduces hospital stay, allows safe nursing, early rehabilitation, and less medical complications. We opted for early surgical intervention in the form of adequate stabilization so that the patient can be put to early rehabilitation.

CONCLUSION

We believe that even if the translational thoracic spine dislocation may be suggested as a stable injury due to the stability provided by uninjured rib cage, early operative fixation is required to regain spine stability and subsequently immediate rehabilitation may favor better clinical outcome.

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