Thoracic spondyloptosis

Traumatic spondyloptosis of the thoracic spine is an uncommon injury. In most cases, spondyloptosis is confined to one vertebral body, whereas double-level spondyloptosis is extremely rare. Most patients who sustain traumatic spondyloptosis immediately become paraplegic, but in some cases neurological function is preserved. If this occurs, it is due to detachment of the pedicles from the corresponding vertebral body, resulting in spontaneous decompression of neural elements.

Spondyloptosis developing due to severe trauma are very rare spinal injuries of the upper-mid thoracic region.

The rarity of these injuries can be primarily attributed to the contribution of the sternum in maintaining stability in the upper-mid thoracic region. Anterior corpectomy (cage placement if needed), posterior transpedicular screw fixation, and fusion are employed in the surgical treatment of ptotic deformities. However, access to the surgical site in the upper-mid thoracic region during thoracotomy is difficult due to the restricting effects of the sternum anteriorly and the scapula posteriorly. Furthermore, the operation is quite risky because of the heart and the great vessels. The decision for surgery should be made after considering the age, neurological condition, and degree of instability of the patient [1) 2) 3)].

Case reports

2015

A case of undetected traumatic double-level spondyloptosis in the upper thoracic region in an adult male patient who was neurologically intact for 2 days but later became paraplegic. Initially, management of this pathology seemed a very challenging scenario. However, with review of the reconstructed CT images and reproduction of the injury on a plastic model, a posterior-only approach was chosen as an alternative operative solution for this catastrophic injury. Via this single-stage posterior approach, long-segment pedicle screw/rod instrumentation resulted in successful reduction, restoration of alignment, and stabilization after 1-level posterior spondylectomy. To the best of the authors' knowledge, this is the first example reported in the literature of double-level spondyloptosis of the thoracic and the lumbar spine. This report describes the rationale, mechanism, and technical details afforded for reduction and stabilization of this rare injury [4)].

2014

A 49-year-old male was admitted to the emergency department of another hospital because of a high-speed car crash. He was conscious and collaborating and showed a complete paraplegia. Spinal computed tomographic scan showed a posterior expulsion of the T4 vertebral body and dislocation into the spinal canal. Magnetic resonance imaging of the spine confirmed the presence of a 2-level adjacent T3-T4 and T4-T5 disk disruption and severe compression of the spinal cord by the T4 vertebral body. We performed a posterior stabilization from T1 to T8 with T4 vertebrectomy and spine shortening.

A postoperative computed tomographic scan showed a tolerable sagittal and frontal alignment and

apposition of the endplates of T3 and T5. At present, 12 months after surgery, the patient is neurologically unchanged, but he can keep the sitting position without support.

Total vertebrectomy and spinal shortening are safe and replicable procedures applicable in few patients with paraplegia. A surgical procedure after 3 weeks makes a complete reduction and a perfect sagittal alignment of the spine difficult to be obtained [5)].

2009

Traumatic thoracic spondyloptosis without neurologic deficit, and treatment with in situ fusion [6)].

2007

A report describes two patients with T6-7 and T12-L1 spondyloptosis secondary to trauma. The former was a 36-year-old man who was pinned under a 200 kg hay bale, suffering immediate paraplegia and undergoing successful posterior reduction and stabilization via a single stage posterior approach. Two years after his injury he has not developed any new deformity or neurological deterioration. The latter was a 22-year-old miner who was thrown against the ceiling of a coalmine and suffered a hyperflexion injury resulting in an immediate T12 paraplegia. Again successful reduction and stabilization was able to be achieved through pedicle screw instrumentation via a single-stage posterior approach. These two patients are the first reported cases of traumatic thoracic spondyloptosis. This report describes the rationale, likely mechanisms and surgical technique required for operative reduction and stabilization via a single-stage posterior approach [7)].

2002

A surgical management of a midthoracic spondyloptosis associated with kyphosis in a child with neurofibromatosis, an extremely rare but a potentially high-morbidity complication.

Dystrophic kyphoscoliotic spinal deformity is the most common orthopedic sequela of neurofibromatosis. Spondyloptosis is a rare complication but with the potential for high morbidity if the diagnosis is missed or undertreated. Reported cases are rare.

A severe thoracic spondyloptosis occurred in a 7-year-old girl with peripheral neurofibromatosis who presented with transient paraparesis after a fall. The kyphosis was reduced by cantilever correction forces, achieving side-to-side (bayonet) apposition rather than anatomic reduction of the spondyloptosis. This was followed by anterior spinal arthrodesis and structural grafting.

Two and a half years after the surgery there is no loss of correction, and the patient has remained neurologically recovered.

Posterior correction of the gibbus in a bayonet apposition and stabilization with a two-rod construct followed by anterior spinal arthrodesis and structural grafting seem to offer efficient surgical treatment [8)].

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