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IMAGES OF SPINE CARE

Traumatic high-grade L5–S1 spondylolisthesis with vertebral physeal injury

Case

An 11-year-old girl was hit by a collapsed beam and injured her back in 2008 Wenchuan earthquake. Her demonstration was severe lumbosacral pain and numbness in both lower limbs. The neurologic examination showed a diminished sensation below L5 and level Grade-4 power in both tibialis anterior and posterior muscles. Lumbar plain radiograph showed unilateral multiple transverse process fracture (L1–L5 in right), almost total anterolisthesis of L5 over S1. Computed tomography scans showed severe (Grade 4) anterior slippage of L5 vertebra with intact L5–S1 intervertebral disc and physeal cartilage of S1 superior end plate (Fig. 1).

The patient underwent L5–S1 laminectomy, reduction, posterolateral fusion at 3 days after injury. The L5–S1 intervertebral disc has confirmed intact in operation, and the tore S1 physeal cartilage was reduced accompanied to the slippage reset. Postoperatively, her lower limb power increased to Grade 5, and sensation returned to normal. She underwent another surgery to remove internal fixation 3 years later. At 6.5 years after primary surgery, radiographs showed that the heights of L5 and S1 were slightly increased (2 mm) comparing to those observed at the initial injury. And the lumbar magnetic resonance imaging demonstrated a repaired L5–S1 intervertebral disc. Surprisingly, a mild primary lumbar scoliosis has appeared since 2 months after surgery and been stable at 27° since 3 years after operation (Fig. 2).

Traumatic lumbosacral spondylolisthesis in children is extremely rare [1,2]. In developing spine, a zone of relative weakness occurs at the junction of physeal cartilage and vertebral body ossification [3,4]. In the patient, the drastic tangential force leads to her specific Salter-Harris Type 1 physeal injury. By posterior reduction, we reset the avulsion physeal. And for reconstructing, we chose the posterolateral fusion but not the usually recommended interbody fusion because of its damage to the growth plate of anterior column. Finally, the intervertebral disc has been repaired, and longitudinal growth of the vertebral body has been well reserved (Fig. 2).

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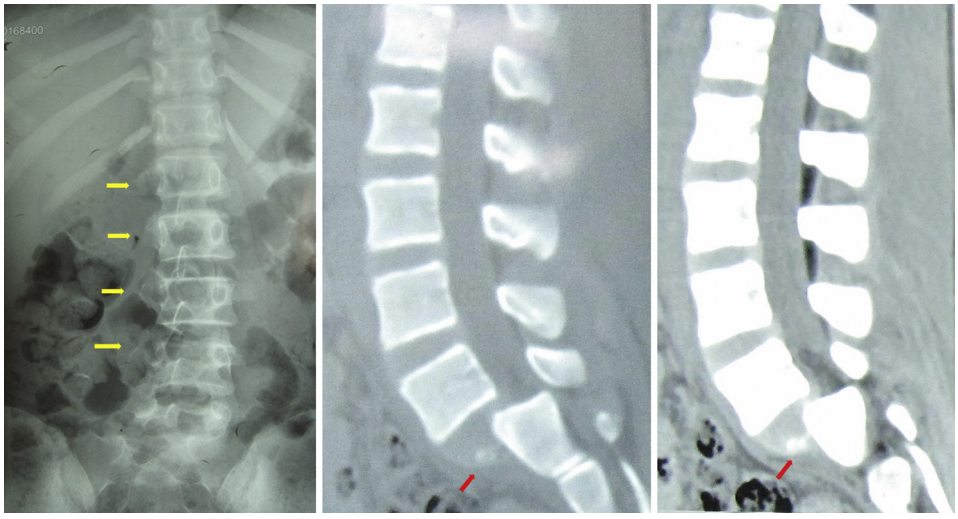

Fig. 1. Radiographs after injured. (Left) Anterior-posterior view of X-ray, yellow arrows show unilateral transverse processes fracture. In (Middle) soft-tissue window and (Right) bone window of computed tomography, red arrow shows physeal cartilage of S1 superior end plate.

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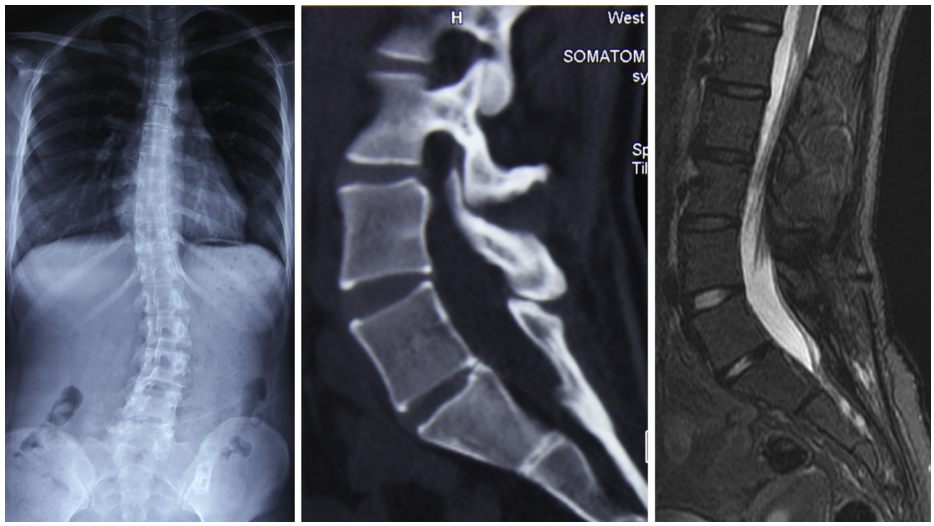

Fig. 2. Radiographs at 6.5 years after surgery. (Left) Anterior-posterior view of total spine X-ray shows a mild primary lumbar scoliosis (Cobb 27°). (Middle) Sagittal CT scan shows a solid posterior fusion. (Right) MRI shows a repaired L5–S1 disc.

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