A case of vertebral fracture associated with diffuse idiopathic skeletal hyperostosis treated by a successful conservative treatment

Kazuo Saita*, Yoshiro Monobe, Satoshi Oghara, Yosuke Kobayashi, Kei Sato, Keiji Nishimura, and Masayuki Tanabe

Department of Orthopaedic Surgery, Saitama Medical Center, Saitama Medical University, Japan

*Corresponding author:
Kazuo Saita
Department of Orthopaedic Surgery, Saitama Medical Center, Saitama Medical University, Kawagoe, Japan
Tel.: 81-49-228-3627; Fax: 49-223-8426; Email: saita@saitama-med.ac.jp

Conflicts of interest: The authors declare that there are no conflicts of interest.

Sources of funding: None

Type of contribution of the authors: K Saita wrote and prepared the manuscript, and all of the authors participated in the study design. All authors have read, reviewed, and approved the article.

Approval code: Unnecessary

Keywords: diffuse idiopathic skeletal hyperostosis, vertebral fracture, conservative treatment
We present a case of vertebral fracture associated with diffuse idiopathic skeletal hyperostosis (DISH) treated by a successful conservative treatment. DISH-associated vertebral fracture is unstable like a long bone fracture and often leads to severe paralysis after displacement. Early surgical stabilization is recommended; however, 26.6% postoperative complications, neurological deterioration, and perioperative deaths have been reported. Conservative treatment is selected in patients with surgical risk factors or delayed diagnosis. However, detailed reports on conservative cases are lacking.

A 63-year-old man experienced back pain after a fall. He had hypertension, diabetes, and hemodialysis for 3 years and had undergone coronary stent graft for angina pectoralis 1 year before. One month after the fall, he visited a clinic and was diagnosed with vertebral fracture, and posterior fusion surgery was recommended. However, he rejected surgery because he had not received any treatment for 1 month and experienced only slight back pain. Then, he visited our hospital. He could walk without aid or external fixation and showed no neurological deficit.

Computed tomography (CT) 1 month after the fall revealed continuous ossification of the anterior longitudinal ligament (OALL) from T2 to L2, and it was broken at T7/T8 (Fig.1-ab). On the right side, the fracture line ran through the T8 vertebral body horizontally via the T8 pedicle to the posterior wall of the lamina (Fig.1-a). The T6-T8 spinous processes were fractured vertically (Fig.1-b). In the spinal canal, the yellow ligament ossified in the mid-posterior portion.

It was diagnosed as DISH, not ankylosing spondylitis, as there was no history of low back pain and no inflammation finding in the blood examination and there was a large lumbar osteophyte. As there was no neurological deficit, he refused surgical treatment. Furthermore, he had many comorbidities; therefore, he was treated conservatively with thoracolumbar orthosis made with plastic and metal frame covering the chest to the iliac crest while performing standing activities about 4 to 12 hours per day. He came to our clinic every month for 5 months and after once for every 2 months, and CT evaluation was performed at 1, 2, 3, 5, 7, 11, 15 months after the injury, and plain X-ray was performed at 4, 9 months.
Two months after the injury, back pain was reduced and he could recline on a tilted chairback. CT showed no fracture displacement. Three months after the injury, back pain while lying down resolved. Ventral callus formation ahead of OALL at T7/T8, sclerotic change in the T8 vertebral body, and callus formation around the spinous process were observed (Fig.2-a). After 5 months, he experienced back pain only when lying on a hard floor. Ventral callus formation ahead of OALL had developed, and the fracture line in the posterior T8 vertebral body became unclear. Seven months after the injury, ventral callus formation ahead of OALL developed into a large mass (Fig.2-b). Subsequently, back pain completely resolved, and the ventral callus was linked between T7 and T8 after 9 months. Ventral callus matured, anterior cortex united firmly, and fracture ossification of the supraspinous process ligament united after 11 months; therefore, the thoracolumbar orthosis was removed. Fifteen-month CT revealed adequate unification of the vertebral body and spinous process (Fig.2-c).

We hesitated to select conservative treatment owing to insufficient information. Efficacy of conservative teriparatide treatment for lumbar fracture in DISH was reported \(^7\); however, teriparatide was not suitable for our patient because of secondary hyperparathyroidism due to hemodialysis. The fracture in our case was relatively stable because the fracture lines were complicated three-dimensionally and T7-T8 was in a relatively stable level owing to the rib cage. This stability is the key to successful conservative treatment. Patients with delayed diagnosis over 1 month of DISH-associated vertebral fracture may be treated conservatively, especially those with many surgical risks. The detail of this report will be informative for the selection of conservative treatment.

References


Figure legends
Fig. 1 Computed tomography on first visit 1 month after the fall. a) Right side, b) midline

Fig. 2 Computed tomography after the fall. a) 3 months, b) 7 months, c) 15 months
OALL, ossification of the anterior longitudinal ligament
Fig. 1 Computed tomography on first visit 1 month after fall. a: Right side, b: Midline

- Fracture line
- continuous ossification of the anterior longitudinal ligament
- Ossification of the yellow ligament

285x190mm (64 x 64 DPI)
Fig. 2 Computed tomography after fall. a: 3 months, b: 7 months, c: 15 months
OALL: ossification of the anterior longitudinal ligament

Ventral callus formation ahead of the OALL
United spinous process and ossification of the supraspinous process ligament

285x190mm (64 x 64 DPI)