

Abstract: 377

Diagnosis and Treatment of Nonunion of Osteoporotic Thoracolumbar Vertebral Fractures

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Objective: To explore the clinical situation of osteoporotic vertebral fracture nonunion, imaging characteristics, diagnosis and treatment options.

Methods: From April 2003 to May 2007, the clinical data of 21 patients with nonunion of osteoporotic thoracolumbar vertebral fractures were studied and relative literatures were reviewed, in order to sum up the characteristics of the fracture nonunion. There were 9 males and 12 females, and the mean age of the patients was 68.4 years with a range of 58~85 years. All cases received radiography and MRI examination, 14 patients received CT examination. All patients were performed on using kyphoplasty. The curative effect of kyphoplasty was evaluated by measuring back pain at preoperative, postoperative and followed-up time. Also, anterior vertebral border high was measured at preoperative, postoperative and followed-up time.

Results: All cases had back pain before operation. The back pain has a certain feature that is distinctly proportional to activity and position, which was almost completely relieved by rest while the symptom returned as soon as the patients was loaded in attempting to sit, stand, or walk. Imaging characteristics of the nonunion are intravertebral clefts or so-called vacuum phenomena on vertebral imaging views as well as dynamic mobility which refers to a change of vertebral height or configuration with changes in body positioning. The cleft can be detectable on T₂-weighted MR images and short tau inversion recovery MR images as an area of high signal intensity and on T₁-weighted MR images as an area of low signal intensity. All patients had immediate relief of back pain after kyphoplasty operation, and spinal alignment was significantly restored.

Conclusions: Osteoporotic thoracolumbar vertebral fractures may develop nonunion like other bone fracture. The diagnosis of the fracture nonunion mainly depends on clinical situation and imaging characteristics. The cardinal symptom is refractory to conservative treatments, and these patients often need operative intervention. At present, the best surgical treatment option may be kyphoplasty.