Case Report

Spontaneous reduction of a floated ossification of the ligamentum flavum after posterior thoracic decompression (floating method); report of a case (abridged translation of a primary publication)

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Abstract

BACKGROUND CONTEXT: Although complete resection is the preferred surgical treatment for ossification of the ligamentum flavum (OLF), it sometimes results in the floating method because of adhesion to, or ossification of, the dura mater. It is difficult to anticipate the degree of floating, and if the floated ossification is large, decompression of the spinal cord may not be sufficient.

PURPOSE: To describe a case of spontaneous reduction of a floated OLF after posterior decompression.

STUDY DESIGN: Case report and review of the literature.

METHODS: A 70-year-old woman with OLF of the thoracic spine presented with gait disturbance. A computed tomographic myelogram showed a large ossification and severe spinal canal stenosis at T10–T11. It also showed slight spinal cord compression by ossification at T9–T10.

RESULTS: We performed a laminectomy with floating ossification at T9–T11 and posterior fusion with a pedicle screw system at T10–T11. After the operation, the patient’s neurologic improvement was excellent. Five weeks after the operation, a computed tomogram showed reduction of the floated ossification. Improvement progressed up to 3 months after the operation, bringing a sufficient decompression of the spinal cord, whereas it was insufficient immediately after the operation.

CONCLUSIONS: Our present study is the first report that showed OLF was reduced after the floating method. Reduction of the floated ossification was observed 5 weeks after the operation. © 2013 Elsevier Inc. All rights reserved.

Keywords: Ossification of the ligamentum flavum; Floating method; Myelopathy; Thoracic spine

Introduction

Although complete resection is the preferred surgical treatment for ossification of the ligamentum flavum (OLF), it sometimes results in the floating method because of adhesion to, or ossification of, the dura mater. It is difficult to anticipate the degree of floating, and if the floated OLF is large, decompression of the spinal cord may not be sufficient. We report a case of spontaneous reduction of a floated OLF several weeks after the operation that brought sufficient decompression of the spinal cord, whereas it had been insufficient immediately after the operation.

Case report

A 70-year-old woman with OLF of the thoracic spine presented with gait disturbance. On admission, she was able to walk independently but her gait was slow and unsteady. Her muscle strength in the lower limbs was normal, but pinprick sensation was reduced up to the level of the T10 dermatome. Hyperreflexia was not present at the bilateral
patellar and Achilles tendons, but left ankle clonus was transiently positive. A computed tomographic (CT) myelogram showed a large OLF and severe spinal canal stenosis at T10–T11 (Fig. 1). It also showed slight spinal cord compression by OLF at T9–T10.

We planned a T9–T11 laminectomy and T10–T11 posterior fusion with a pedicle screw system but were unable to completely resect the OLF, which resulted in floating it because of the ossification of the dura mater. After the operation, the patient’s neurologic improvements were excellent and she began to walk on the fourth postoperative day. Five weeks after the operation, CT showed that the patient’s spinal fusion was successful and the floated OLF was reduced (Fig. 2). Progressive reduction of the floated OLF continued up to 3 months after the operation, leading to the formation of a normal round-shaped spinal canal. A magnetic resonance image showed sufficient decompression of the spinal cord 4 months after the operation, whereas it was insufficient on CT myelogram immediately after the operation (Figs. 2 Left and 3). As for T9–T10, sufficient floating of the OLF and decompression of the spinal cord were observed 3 months after the operation, but the degree of reduction of the OLF was small.

Discussion

Yamaura [1] reported that a floated ossification of the posterior longitudinal ligament changed with a tendency to atrophy after an operation using the floating method. We are unaware of previous reports that stated OLF was reduced after the floating method. In the present case, sufficient decompression of the spinal cord was obtained by the reduction of the OLF after the floating method, whereas it was insufficient immediately after the operation.
The basis for the reduction of the OLF is unclear. Pulsations of the thecal sac [2] and/or venous plexus [3] are thought to be responsible, similar to bone fragment resorption after a spinal burst fracture, as the spinal canal changed to a normal round-shape after reduction of the OLF. Moreover, the time of reduction of the OLF is compatible with the observation that spinal canal compromise decreased significantly by 3 to 4 weeks after a spinal burst fracture [4].

It is also unclear whether spinal fixation is needed for the reduction of the OLF. In the present study, the degree of reduction of the OLF for T9–T10, which was not fixed, was small. The smaller reduction of the OLF at T9–T10 may be because the floated OLF was small, the degree of floating was sufficient, and/or the shape of the dura mater normalized immediately after the operation. It is also possible that the pulsations of the thecal sac and/or venous plexus that usually promote reduction are too small at this level to be effective. However, mechanical stress can cause the OLF to develop [5,6]. Spinal canal fragments are prompt to resorb after stabilization of the thoracolumbar burst fractures [2]. Thus, spinal fixation might promote reduction of the floated OLF, and it might be a possible alternative if floating of the OLF is not sufficient.

References