



Contents lists available at ScienceDirect

Journal of Clinical Neuroscience

journal homepage: www.elsevier.com/locate/jocn

Clinical commentary

Surgical outcome of thoracic myelopathy caused by ossification of ligamentum flavum

Hua Wang^{a,1}, Fuxin Wei^{a,1}, Houqing Long^a, Guowei Han^a, Shilabant Sen Sribastav^a, Zemin Li^a, Yangliang Huang^a, Ronglan Zhu^{b,*}, Chunxiang Liang^{a,*}

^a Department of Orthopaedics, First Affiliated Hospital of Sun Yat-sen University, 58 Zhongshan Second Road, Guangzhou, PR China

^b Department of Neurology, First Affiliated Hospital of Sun Yat-sen University, 58 Zhongshan Second Road, Guangzhou, PR China

ARTICLE INFO

Article history:

Received 3 January 2017

Accepted 11 July 2017

Available online xxx

Keywords:

Ossification of the ligamentum flavum

Thoracic myelopathy

Decompressive laminectomy

Surgical treatment

ABSTRACT

Ossification of the ligamentum flavum (OLF) may result in thoracic myelopathy (TM) because of the spinal canal narrowing. The aim of this study was to investigate clinical outcomes of symptomatic thoracic OLF treated using posterior decompressive laminectomy. We made a retrospective review of patients who underwent posterior decompressive laminectomy from 2007 through 2016 for symptomatic TM caused by OLF. Thirty-three patients who had surgery for TM caused by OLF that was diagnosed based on clinical, radiologic, and pathologic evaluations. All patients had undergone decompressive laminectomy and excision of the OLF. The clinical course was evaluated according to modified JOA scores. Magnetic resonance imaging was used to determine the number of vertebral segments demonstrating OLF, the level of thoracic cord involvement, and spine lesions coexisting with OLF. Results showed the neurological status improved at follow up (70.82 ± 32.22 months) from a preoperative mean Japanese Orthopaedic Association score of 7.03 ± 1.29 points to 9.52 ± 0.83 points at the last follow up ($p < 0.01$). Recovery outcomes were excellent in 8 patients, good in 22 patients, fair in 2 patients and poor in 1 patient. Surgical complications, which resolved after appropriate and prompt treatment, including cerebrospinal fluid leakage in 4 patient, immediate postoperative neurologic deterioration in 2 patient, and wound infection in 4 patient. Our findings suggest that posterior decompressive laminectomy with or without instrumented fusion is an effective treatment for symptomatic thoracic OLF, which provides satisfactory clinical improvement.

© 2017 Published by Elsevier Ltd.

1. Introduction

Ossification of the ligamentum flavum (OLF) is a relatively rare reason of myelopathy with the prevalence from 3.8% to 26% [1], and is being increasingly recognized as main cause of slowly progressive thoracic myeloradiculopathy [2], which is relatively common in East Asian population [3]. Patients with thoracic OLF have various symptoms, such as trunk or lower extremities sensory abnormality, gait disturbance, urinary dysfunction, etc. [4]. Half of our patients chief complaints were lower-extremity tingling and numbness or pain, which were similar with patients with

lumbar disorders [5]. Because of varied symptoms and physical examination, diagnosis of thoracic myeloradiculopathy caused by OLF is sometimes difficult to confirm.

OLF generally requires surgical treatment, because the disease is progressive and its response to conservative therapy is poor [6]. Posterior decompression which is the most effective treatment is indicated in patients with OLF [7]. However, surgical outcomes of OLF are not always satisfactory, complications are frequently encountered, and dural ossification in thoracic OLF will increase the risks of complications, such as cerebrospinal fluid leakage, spinal cord injury and nerve roots injury. In this study, we retrospectively studied the clinical presentation, pathology, and treatment outcome in a series of 33 southern Chinese patients with OLF-induced thoracic myelopathy who underwent posterior thoracic extensive decompressive laminectomy with or without instrumented fusion.

Posterior decompression is the most effective treatment, but surgical outcomes of OLF are not always satisfactory.

* Corresponding authors at: Department of Orthopaedic Surgery, First Affiliated Hospital of Sun Yat-sen University, 58 Zhongshan Second Road, Guangzhou 510080, PR China.

E-mail addresses: wangxucheng@gmail.com (H. Wang), suifeng720@163.com (F. Wei), longhq@163.com (H. Long), hangw@163.com (G. Han), shilabant@gmail.com (S.S. Sribastav), sdlizemin@163.com (Z. Li), 18902300896@163.com (R. Zhu), lchxzhrl@163.com (C. Liang).

¹ Hua Wang and Fuxin Wei contributed equally to this work.

2. Materials and methods

2.1. Patients inclusion

Records of patients who underwent spinal surgery at our hospital from 2007 to 2016 were searched, 33 patients with thoracic myelopathy due to OLF received surgical treatment were included. Patient's age, sex, preoperative symptoms, duration of symptoms and neurologic findings before surgery were carefully reviewed. Preoperative radiography, MR imaging and electromyography were obtained. Diagnosis of TM caused by OLF were based on findings of history, physical examination, radiologic, and pathologic evaluations. Systemic diseases such as diabetes mellitus and hypertension were examined. Exclusion criteria were other neuromuscular disorders, vitamin B deficiency, and alcoholism. Experienced spine surgeons performed the operations, and the institutional review board at our institution approved the study protocol.

2.2. Surgical procedure

Surgery indicated for progressive and/or severe TM caused by OLF. Under prone position, intra-operative radiography was used to detect the OLF level for surgery, and posterior decompression was performed. All patients underwent extensive thoracic laminectomy and en bloc resection of the OLF by cutting the bony junction between the pedicle and upper facet with high-speed drill. Posterior fusion and instrumentation surgery was done in cases where local instability had been noted. After decompression of the spinal cord, paravertebral muscle, supraspinous ligament, paraspinal muscles, deep fascia and skin were sutured, and continuous pressure applied to the wound. We always placed a subfascial drain for posterior wounds, and drains were removed on the third postoperative day.

2.3. Neurological assessment

The modified Japanese Orthopaedic Association (JOA) scoring system was used to evaluate the neurological status of patients before and after surgical decompression, which excluded the sections regarding upper extremity function [8]. The maximum score of 11 indicates normal function, total score ≤ 3 was considered severe neurological impairment, 4–6 was moderate, and ≥ 7 was mild. The extent of recovery was calculated by improvement rate (IR), with excellent ($IR \geq 75\%$), good ($75\% > IR \geq 50\%$), fair ($50\% > IR \geq 25\%$) or poor ($IR < 25\%$) [9]:

$$IR = \frac{\text{Postoperative JOA score} - \text{Preoperative JOA score}}{11 - \text{Preoperative JOA score}} \times 100\% \quad (1)$$

2.4. Postsurgical evaluation

Efficacy of the surgical procedures was assessed based on surgical time, blood loss during surgery, and JOA score.

2.5. Radiological evaluation

Presurgical radiologic examination consisted of ordinary X-ray, computed tomography, and magnetic resonance imaging (MRI). Preoperative plain X-ray played an important role in determining the intraoperative location of OLF. CT scans were performed to confirm the location and extent of ossified spinal lesions. MRI was performed to determine the location and number of segments affected

by the OLF, spinal cord involvement and any coexisting spinal disorders.

2.6. Statistical analysis

Student's *t*-test was used to compare data. The results were considered significant when the *p* value was < 0.05 . Results are presented as mean \pm standard deviation (SD). All data were analyzed by using Statistical Package for the Social Sciences for Windows (SPSS, Chicago, IL, USA).

3. Results

There were 18 male and 15 female patients with mean age of 55.03 ± 14.00 years. The initial symptoms were lower limb weakness/numbness (32 patients), back/leg pain (14 patients), gait disturbance (14 patients), Zonesthesia (3 patients), hypesthesia (3 patients). The duration of symptoms ranged from 1 to 120 months (26.70 ± 27.60 months). There were 65 affected intervertebral disc levels in total, main involved segments were T10–11 (15.2%) and T10–12 (21.2%), fifty-seven percent of the patients had multilevel OLF. The numbers of OLF-involved segments were as follows: 1 segment in 15 patients, 2 in 10, 3 in 5, ≥ 4 in 3. Besides the OLF of thoracic spine, 2 patients had cervical myelopathy, 3 had spondylolisthesis, 5 had spinal stenosis and 3 had disc herniation coexisting with OLF. Nine patients had hypertension, two patients had diabetes mellitus. All preoperative clinical symptoms and signs in the 33 patients are listed in Table 1. Typical cases are shown in Figs. 1 and 2

The mean operation time was 123.94 ± 52.73 min, intraoperative blood loss was 206.67 ± 232.62 ml. All patients chose to undergo surgical decompression due to recent neurological deterioration. Postoperative follow up ranged from 6 to 131 months (70.82 ± 32.22 months).

Generally, the neurological status had improved at follow-up from pre-operative mean JOA score of 7.03 ± 1.29 (range 3–9) points to 9.52 ± 0.83 (range 7–11) points ($p < 0.01$). The IR of neurological function ranged from 40% to 100% ($71 \pm 17\%$). The surgical outcome was excellent in 8 (24.2%) patients, good in 22 (66.7%) patients, fair in 2 (6%) patients and poor in 1 (3%) patient (Table 2). No patient had worsened neurological symptoms. Nine patients underwent posterolateral thoracic instrumented fusion, surgical outcome was excellent in 2 (22.2%) patients, good in 5 (55.6%) patients, fair in 1 (11.1%) patient and poor in 1 (11.1%) patient (Table 2). Twenty-four patients underwent decompression alone, surgical outcome was excellent in 6 (25.0%) patients, good in 17 (70.8%) patients, fair in 1 (4.2%) and poor in 0 (0%) patient (Table 2). The surgical outcome showed no significant difference between these two subgroups.

Four patients experienced leakage of cerebrospinal fluid (CSF) due to dural tear during the operation, because of tight adhesions between the OLF and the dura mater. The CSF leakage stopped after five to seven days of conservative treatment with local pressure. Two patients suffered immediate postoperative neurologic deterioration and recovered neurological function one month after conservative treatment. Four patients suffered superficial wound infection, and was resolved after two weeks of specific antibiotic therapy.

4. Discussion

In this study, we described our experience with 33 Chinese patients who underwent operations for thoracic OLF lesions. The most common symptomatic level were T10–11 (15.2%) and T10–12 (21.2%). The recovery outcome was excellent in 8 (24.2%)

Download English Version:

<https://daneshyari.com/en/article/8685516>

Download Persian Version:

<https://daneshyari.com/article/8685516>

[Daneshyari.com](https://daneshyari.com)