

# The Essence of Clinical Practice Guidelines for Ossification of Spinal Ligaments, 2019: 7. Treatment of Thoracic OLF

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OLF, OYL, guideline, treatment

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## Treatment of Thoracic OLF

### Summary

- Effects: In OLF, an improvement in JOA score can be obtained through surgical treatment.
- Outcome-related factors: Regarding outcome-related factors, a correlation between many factors has been suggested. However, no factor has been identified with which surgical outcomes can be reliably predicted, and no conclusion has been reached as to whether the presence of dural lesions correlates with postoperative outcomes and prognosis.
- Prognosis: There are almost no reports of the postoperative prognosis of patients with OLF, and the long-term postoperative prognosis of this condition is unclear.

### Commentary

#### 1. Effects

Summarizing the results of previous papers on the surgical outcomes of thoracic OLF, neurological improvement was generally obtained to varying degrees<sup>1-3</sup>. A significantly inferior improvement rate in the mid-thoracic spine has been reported<sup>4</sup>.

#### 2. Outcome-related factors

Regarding outcome-related factors, thermal nociception, improvement of vibration sensation disorder, history of trauma, and other concurrent ossifications of the spinal ligaments have been reported as correlating factors<sup>5</sup>. In addition, preoperative abnormal joint position sense of the hallux<sup>6</sup>, the number of segments affected by OLF<sup>6</sup>, the disease duration<sup>1</sup>, the presence of noncontinuous OALL at the greatest stenosis<sup>1</sup>, and dural ossification<sup>1</sup> have been reported as factors that correlate with postoperative results. On the other hand, it is reported that there is no correlation with age<sup>6</sup>, sex<sup>1,6</sup>, disease duration<sup>6</sup>, the presence or absence of diabetes and hypertension<sup>6</sup>, OLF level<sup>1</sup>, number of segments affected<sup>1</sup>, and surgical procedure<sup>1</sup>.

In a Chinese study, the OLF level (mid-thoracic spine), disease duration, intramedullary signal intensity changes on MRI<sup>2</sup>, longer duration of preoperative symptoms, the degree of anteroposterior compression, OLF of the mid-thoracic spine<sup>4</sup>, preoperative JOA score <6 points and fused-type OLF<sup>4</sup>, as well as beak-type OLF<sup>7</sup> have been reported as factors associated with surgical outcomes.

## The Incidence, Cause, and Risk Factors of Complications in Surgery for OLF

### Summary

- The primary complications in surgery for OLF include dural laceration, liquorrhea, postoperative exacerbation of neurological symptoms, wound infection, and extradural hematoma.

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## Commentary

### 1. The incidence of dural laceration

The incidence of concurrent dural ossification is high in fused-type and protruded-type OLF. In surgery for OLF, the incidence of concurrent dural laceration is 7.7-32%<sup>2,6,8-12</sup>.

### 2. Postoperative exacerbation of neurological symptoms

Postoperative exacerbation of neurological symptoms is seen in 0-18% of patients, with possible causes including dural laceration, extradural hematoma, and spinal cord injury<sup>2,6,8-10,13</sup>. In previous studies, some patients with exacerbation of neurological symptoms recovered early<sup>10</sup>, whereas symptoms persisted over the long term for some patients<sup>2</sup>.

### 3. Other complications

Other complications include infection and extradural hematoma, with reported incidences of 0.8-12.1%<sup>2,9-11</sup> and 1.1-3.8%<sup>8,9</sup>, respectively.

## Surgical Treatment of OLF

### Summary

There is no clear evidence whether surgical outcomes for OLF are better with decompression and fusion than with decompression alone. (Recommendation level, 5; evidence strength, D)

### Commentary

In the search of systematic reviews, there were no RCTs that directly compared the postoperative outcomes of decompression alone and decompression and fusion for thoracic OLF.

It has previously been indicated that when laminectomy alone is performed for thoracic OLF, postoperative progression of kyphosis becomes a problem in some cases, since it is the cause of reoperation and poor improvement rate in symptom<sup>14</sup>. However, it has also been reported that postoperative progression of kyphosis is limited in extensive laminectomy without fusion, and no related exacerbation of symptoms is observed<sup>15</sup>. Furthermore, no significant postoperative changes were observed in thoracic kyphosis<sup>16,17</sup>.

With concurrent fusion, the rate of improvement of the JOA score in patients who underwent laminectomy to resect the ossified lesion concurrent with lateral fusion using bone graft alone was significantly better than in the group without fusion<sup>18</sup>. In contrast, there is no statistically significant difference in the preoperative to postoperative local kyphotic angle depending on whether fusion is performed<sup>2,4</sup>.

Among the same reports, only a few compared decompression alone and decompression with fusion; however, the patients who underwent internal fusion were limited to those in whom the cervicothoracic junction or thoracolumbar junction was affected and those with osteoporosis<sup>2,4,18</sup>.

Reduced spinal mobility due to decompression with fusion and increased costs when using instrumentation can be a disadvantage. However, there are certain advantages, such as limiting the postoperative progression of the local kyphotic angle and improving neurological symptoms.

From the above, currently, it cannot be concluded that performing concurrent fusion significantly improves postoperative outcomes. Furthermore, based on the uncertain cost-effectiveness, it is believed that patients have difficulty in selecting a particular treatment method.

After comprehensively considering these studies and following voting for the level of recommendation by nine members of the guideline development committee, the vote results were as follows: 0 vote for ①, strong recommendation to perform; 1 vote for ②, weak recommendation to perform (proposed suggestion); 0 vote for ③, weak recommendation to not perform (proposed suggestion); 0 vote for ④, strong recommendation to not perform; and 8 votes for ⑤, no clear recommendation. Thus, no clear recommendation can be made.

In patients who have instability before surgery and patients who require resection of facet joint for decompression in whom there is a risk of postoperative instability, concurrent fusion may be the most appropriate procedure. However, future studies on this subject are necessary to validate these findings.

For OLF located posterior to the spinal cord, direct decompression can be achieved by posterior decompression, and it should be noted that the pathology is entirely different to that of OPLL located anterior to the spinal cord.

**Conflicts of Interest:** The author declares that there are no relevant conflicts of interest.

This is a part of *The Essence of Clinical Practice Guidelines for Ossification of Spinal Ligaments* (2019), which is listed below.

1. Epidemiology of OPLL, written by Tomohiko Hasegawa, MD, PhD, Hamamatsu University, School of Medicine, Japan. <https://doi.org/10.22603/ssrr.2021-0096>
2. Pathology of OPLL, written by Takashi Kaito, MD, PhD, Osaka University Graduate School of Medicine, Japan. <https://doi.org/10.22603/ssrr.2021-0074>
3. Diagnosis of OPLL, written by Hirotaka Chikuda, MD, PhD, Gumma University, School of Medicine, Japan. <https://doi.org/10.22603/ssrr.2021-0118>
4. Treatment of Cervical OPLL, written by Toshitaka Yoshii, MD, PhD, Tokyo Medical and Dental University Hospital, Japan. <https://doi.org/10.22603/ssrr.2021-0100>
5. Treatment of Thoracic OPLL, written by Shiro Imagama, MD, PhD, Nagoya University Graduate School of Medicine, Japan. <https://doi.org/10.22603/ssrr.2021-0095>
6. Diagnosis of OLF, written by Masao Koda, MD, PhD,

University of Tsukuba, Japan. <https://doi.org/10.22603/ssrr.2021-0116>

7. Treatment of Thoracic OLF, written by Kanji Mori, MD, PhD, Shiga University of Medical Science, Japan. <https://doi.org/10.22603/ssrr.2021-0094>

The original version of this clinical practice guidelines appeared in Japanese as Sekichu Jintai Kokkashou Shinryo Guidelines 2019, published by the Japanese Orthopaedic Association and the Japanese Society for Spine Surgery and Related Research, and its translated version in English appeared in the Journal of Orthopaedic Science 26 (2021) 1-45.

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