

Surgical strategy and outcomes of multi-level ossification of posterior longitudinal ligament in thoracic spine

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Background:

- Ossification of Posterior Longitudinal Ligament (**OPLL**) in thoracic spine may involve more than one vertebral segment, which is a huge challenge for spinal surgeons. Though different surgical approaches were previously described, their clinical outcomes were often unsatisfying.
- Circumferential Decompression (**CD**) has emerged as a promising surgical option, but is technically demanding and even causes severe complications. So methods to determine CD levels are important.

Purpose of the study

- To report the surgical approach for multi-level thoracic OPLL and ways to decide indication levels for CD.

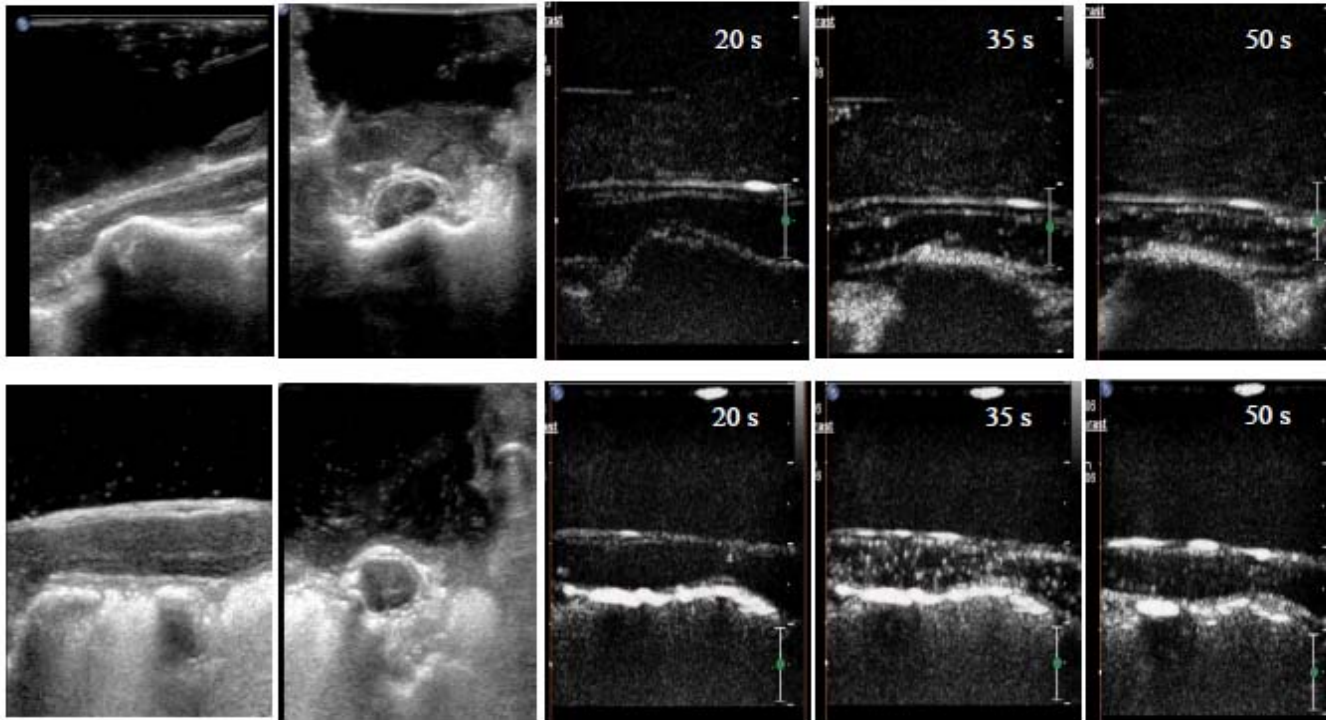
Materials and Methods:

- A total of 27 patients were recruited, from Oct 2008 to Dec 2012.
- PD was undertaken as the initial procedure while CD was prepared according to the imaging manifestation. After PD, the sufficiency of decompression was assessed by combined modalities, including intraoperative ultrasound and microbubbles contrast-enhanced ultrasound. If there was evidence of the remaining anterior compression, these levels were marked out for the subsequent CD.

Materials and Methods:

- CD was accomplished via a transpedicular way. Then the sufficiency of decompression was re-assessed. All the patients received instrumented fusion with pedical screws.
- The modified Japanese Orthopedic Association (JOA) score was utilized to evaluate the neurological status and the recovery rate was assessed by Hirabayashi method.

Intraoperative ultrasound



Pictures in the above row showed evidence of severe indentation of anterior compression, and reduced and delayed blood perfusion;

Pictures in the below row showed the evidence of the removal of anterior compression, re-bulging of the spinal cord, and restored blood perfusion.

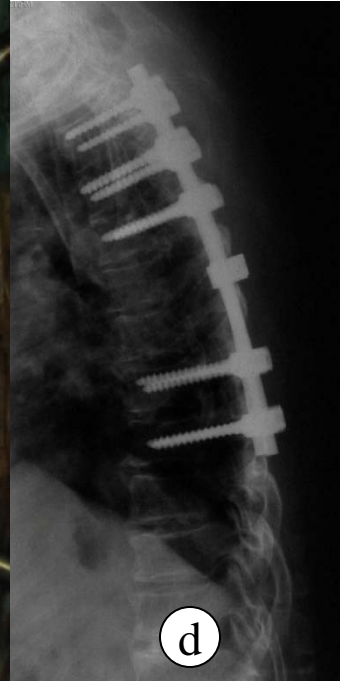
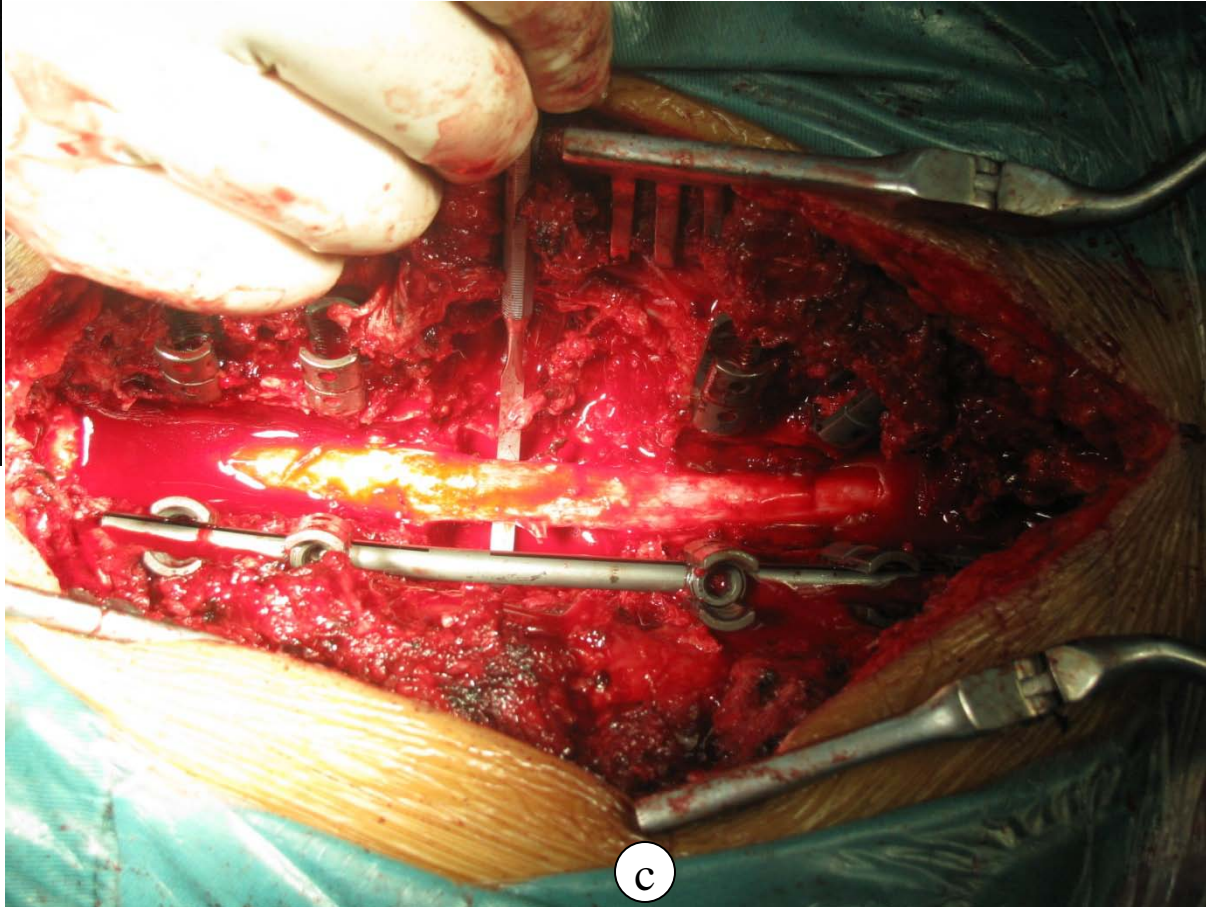
Results :

- The mean operative duration and blood loss were 277.6 minutes and 2207.4 ml. The mean length of OPLL, PD and CD were 4.7, 4.8 and 2.2 levels, respectively.
- 18 patients (66.7%) achieved instant improvement with 9 (33.3%) neurologically deteriorated.
- Cerebrospinal fluid leakage occurred in 10 patients (37.0%). Other complications included urinary infection, incision infection and disunion, lung infection and subcutaneous fluid collection.

Results :

- Late events included death from cerebrovascular event, pseudomeningocele, unremitted intercostal pain and continuing deterioration.
- The final JOA score and recovery rate were correlated with OPLL length and preoperative JOA scores ($P<0.05$).
- Eventually, the average JOA score was significantly elevated from 4.3 to 8.4 ($P<0.05$), with the recovery rate of 12 patients rated as excellent, 7 as good, 6 as fair and 2 as unchanged or deteriorated. The average recovery rate was 61.5%.

Case report:



Presentation of a 62-year-old female. Preoperative imaging examination showed multiple levels of OPLL (*a* and *b*). She underwent T2-T8 posterior decompression and T56 circumferential decompression (*c* and *d*). At the final follow-up, her JOA score was elevated from 4/11 to 11/11.

Conclusion:

- This CD-based surgical strategy provided fair effect for multi-level thoracic OPLL. However, the postoperative complications occurred frequently, so much caution should be taken when performing it. Intraoperative ultrasound was a reliable modality to determine CD levels.

Disclosure:

- **This work was supported by grants from the National Natural Science Foundation of China (No. 81472041) and Beijing Municipal Science and Technology Commission (No. Z141107002514011 and 2014-2-4094).**