

CASE REPORT

OPEN ACCESS

Full open access to this and thousands of other papers at <http://www.la-press.com>.

Intractable Chronic Low-Back Pain Caused by Ligamentopathia Treated Using a Spinous Process Plate (S-plate)

Koichi Iwatsuki, Toshiki Yoshimine, Kazuhiro Yoshimura, Masahiro Ishihara, Yu-ichiro Ohnishi and Yuko Goto

Department of Neurosurgery, Osaka University Medical School, Osaka, Japan. Email: kiwatsuki@nsurg.med.osaka-u.ac.jp

Abstract: We report a case of intractable chronic low-back pain in a gymnast that was caused by ligamentopathia in the interspinous region of the lumbar vertebrae. Sprained interspinous ligaments are a common mechanical cause of acute low-back pain in athletes. Although conservative therapy is generally effective in such cases, in this case it was not. The patient experienced severe low-back pain during lumbar flexion with tension between the L5/S interspinous ligaments. We performed interspinous fixation by using a spinous process plate system, which has been developed for short in situ fusions, and following which the low-back pain resolved. Conservative therapy for low-back pain caused by ligamentopathia is first-line choice, but interspinous fixation with instrumentation might be recommended in intractable cases with conservative therapy.

Keywords: lumbago, ligamentopathia, S-plate, interspinous ligament

Clinical Medicine Insights: Arthritis and Musculoskeletal Disorders 2010:3 1–5

This article is available from <http://www.la-press.com>.

© the author(s), publisher and licensee Libertas Academica Ltd.

This is an open access article. Unrestricted non-commercial use is permitted provided the original work is properly cited.

Introduction

The mechanical causes of back pain include muscle strain and iliac crest apophysitis, sprained interspinous ligaments and kissing spines, thoracic and lumbar Scheuermann's disease, intervertebral disc injuries, leg-length discrepancies, and traumatic and stress fractures of the vertebral body or posterior elements.¹⁻⁵ Sprained interspinous ligaments are a common mechanical cause of acute low-back pain in athletes,⁶⁻⁸ however, they rarely cause intractable chronic low-back pain.

Case

A 37-year-old man visited our neurosurgical unit with a 6-year-history of low-back pain. He had been a gymnast; however, he had quit gymnastics 6 years ago after having suffered from severe low-back pain during training. He had been treated with every mode of conservative therapy, but the pain was intractable. He could not sit for more than 5 minutes without experiencing pain, and this adversely affected his daily life and job.

The pain was located in the midline of the lower back region. Physical examination, showed maximum tenderness over the interspinous ligament between the spinous processes of the L5 and sacrum. The pain was exacerbated during lumbar flexion. X-ray studies of the lumbar spine showed no instability, and disc height and alignment were normal (Fig. 1).

Magnetic resonance imaging (MRI) studies showed abnormal high intensity in the interspinous region (Fig. 2).

We admitted him to our hospital and prescribed bedrest along with a brace. The patient was given injections of dexamethazone (8 mg) and 1% lidocaine (4 ml) in the interspinous lesion 4 times at intervals of 1 week, but this had no effect. We diagnosed the patient with intractable pain caused by ligamentopathy, which was exacerbated by the tension between the L5/S interspinous ligament, and performed interspinous fixation between the L5 and sacrum by using the S-plate (Kisco DIR Co. Ltd., Osaka, Japan) (Fig. 3); ceratite sticks (Kobayashi Pharmaceutical Co., Ltd, Osaka, Japan) were placed in the interlaminar space. The pain reduced remarkably after the surgery, and the plate was removed 6 months thereafter. The visual analogue scale (VAS) was assessed preoperatively and at the 1st, 3rd, 6th, 12th postoperative month for the low-back pain. The Oswestry Disability Index was assessed preoperatively and at the 12th postoperative month. The VAS score measured preoperatively, at the 1st, 3rd, 6th, 12th postoperative month improved significantly to 8.0, 3.0, 2.0, 2.0, 2.0, respectively. The Oswestry Pain Index remarkably improved from 80.0 preoperatively to 20.0 at the 12th postoperative month. The interspinous region

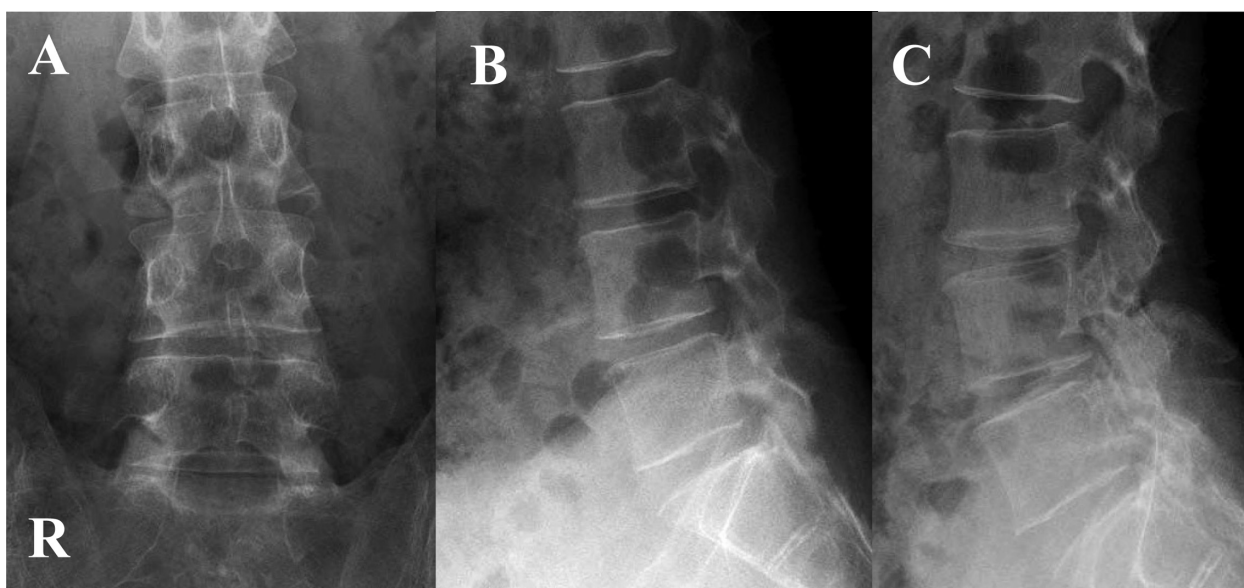


Figure 1. X-ray films of the lumbar spine. **A)** Anteroposterior (A-P) view. Slight scoliosis can be seen. **B)** Lateral view with flexion. **C)** Lateral view with extension. These X-ray films show no instability, and the disc height and alignment are normal.

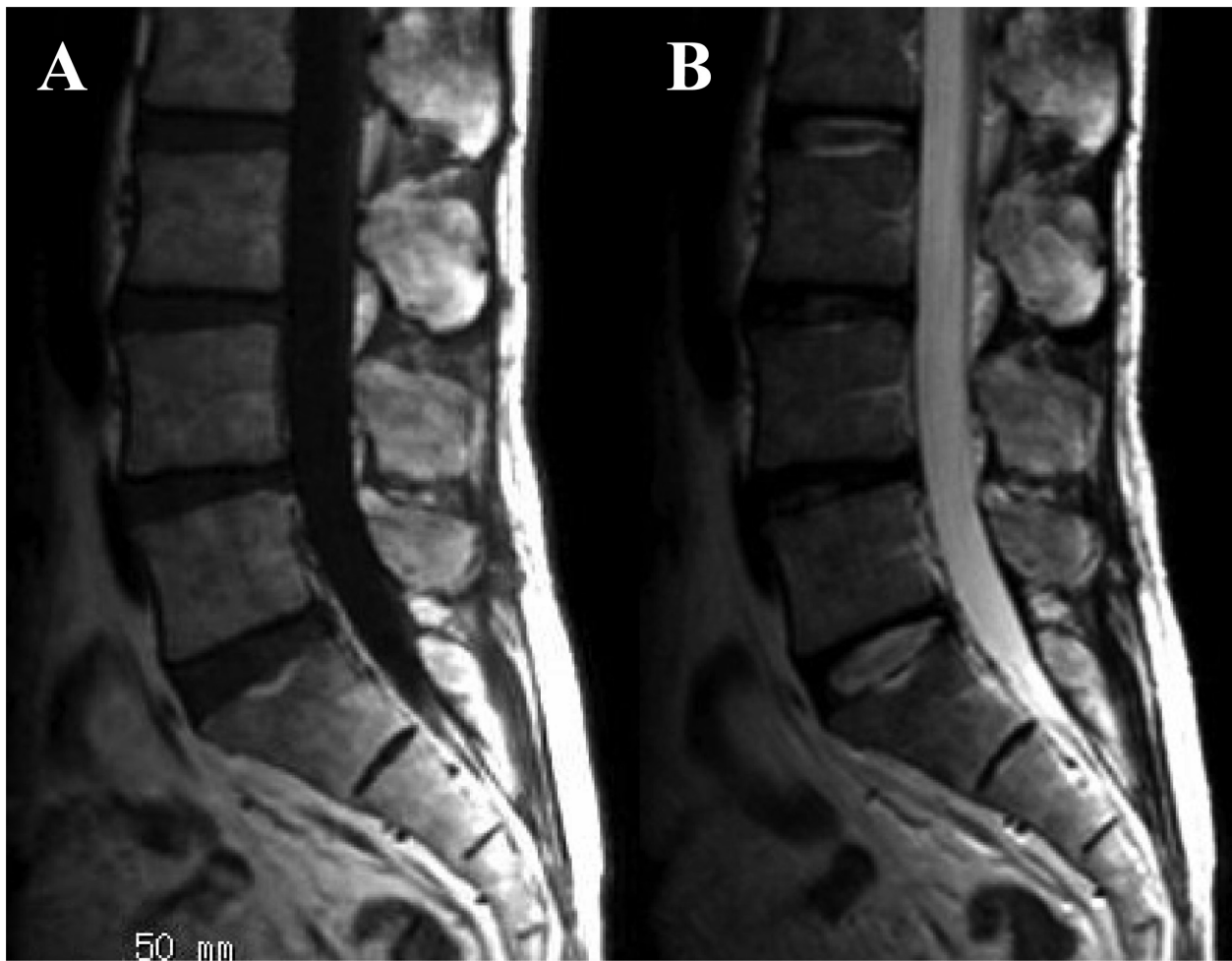


Figure 2. MRI scans of the lumbar spine. **A)** A T1-weighted image. **B)** A T2-weighted image. MRI studies showed abnormal high intensity in the interspinous region.

was gently fixed without bony fusion, but with granulation after the surgery. The interspinous fixation has been maintained even after the removal of the plate. The granulation after the instrumentation surgery could maintain the fixation. The S-plate fixation procedure thus relieved the patient from his low-back pain.

Discussion

Competitive and recreational athletes of all ages commonly experience back pain.⁶⁻⁸ However, the cause and location of the pain are frequently specific to the athlete's age and sport activity performed. The most common mechanical causes of back pain include muscle strains and iliac crest apophysitis, sprained interspinous ligaments and kissing spines, thoracic and lumbar Scheuermann's disease, intervertebral disc injuries, leg-length discrepancies, and traumatic

and stress fractures of the vertebral body or posterior elements.¹⁻⁵

The interspinous ligaments are the most common site of injury.^{6,7} Usually, patients experience acute onset of pain along the midline of the lower back. The pain is exacerbated during flexion of the lumbar spine. In most cases, tenderness, assessed by physical examination, is maximal over the interspinous ligaments, but the patient may also have accompanying paraspinal muscle spasms. The treatment for this condition is the same as that for muscle strain. Thus, complete bedrest and anti-inflammatory medications are advised.^{9,10} In this patient, these modes of conservative therapy were not effective, and thus, the chronic pain was intractable. We confirmed that the intractable pain was caused by ligamentopathy, which was exacerbated by the tension between the L5/S

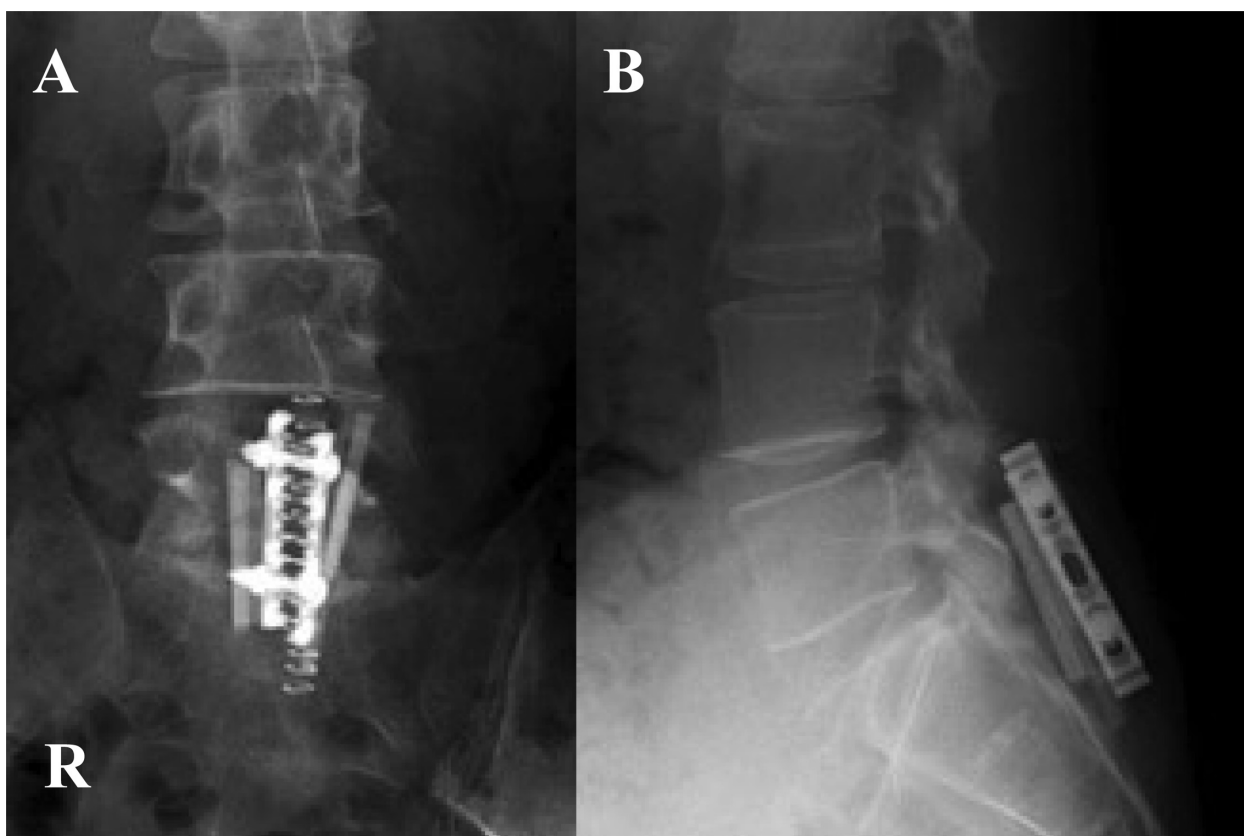


Figure 3. Post operative X-ray films. **A)** Anteroposterior (A-P) view. **B)** Lateral view. The S-plate was fixed between the L5 and sacrum and ceratite sticks were placed in the interlaminar space.

interspinous ligaments. We performed interspinous fixation by using the S-plate, and it has proven to be effective.

The interspinous stabilization system has been developed for short in situ fusions in select patients.^{11,12} In this fixation procedure, the spinous processes are secured between a pair of plates with screws; these plates are then fixed together by tightening the screws that extend through them. This technique is easy and safe and damage to the posterior soft tissue is lesser than that in the case of lateral mass screw fixation and pedicle screw fixation. Our patient was suffering from intractable lumbago caused by stretching of the L5/S interspinous ligament without any intervertebral instability. The S-plate fixation was suitable for this patient, because its use could secure the position of the spinous processes of the L5 and sacrum.

Conservative therapy is generally effective for low-back pain caused by ligamentopathy.^{13–15} In cases wherein conservative therapy is not effective and the pain is intractable, gentle interspinous fixation, such as that using the S-plate, might be effective.

Conservative therapy for low-back pain caused by ligamentopathy is first-line choice, but interspinous fixation with instrumentation might be recommended in intractable cases with conservative therapy.

Disclaimer

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

References

1. Ippolito E, Ponseti IV. Juvenile kyphosis: histological and histochemical studies. *J Bone Joint Surg Am.* 1981;63(2):175–82.
2. Hazlett J. Kissing spines. *J Bone Joint Surg.* 1964;46:1368–9.
3. Bradford D, Moe J, Mantalvo F. Scheuermann's kyphosis and round back deformity: Results of Milwaukee brace treatment. *J Bone Joint Surg.* 1974;56:740–58.
4. Goldstein JD, Berger PE, Windler GE, Jackson DW. Spine injuries in gymnasts and swimmers. An epidemiologic investigation. *Am J Sports Med.* 1991; 19(5):463–8.
5. DeOrto JK, Bianco AJ Jr. Lumbar disc excision in children and adolescents. *J Bone Joint Surg Am.* 1982;64(7):991–6.
6. Keller MS. Gymnastics injuries and imaging in children. *Pediatr Radiol.* 2009.
7. Harvey J, Tanner S. Low back pain in young athletes. A practical approach. *Sports Med.* 1991;12(6):394–406.
8. Caine DJ, Nassar L. Gymnastics injuries. *Med Sport Sci.* 2005;48:18–58.



9. Tanikawa H. Treatment of low back pain (pain of locomotive organs). *Nippon Rinsho*. 2009;67(9):1783–90.
10. Valat JP, Rozenberg S. Local corticosteroid injections for low back pain and sciatica. *Joint Bone Spine*. 2008;75(4):403–7.
11. Senegas J. Mechanical supplementation by non-rigid fixation in degenerative intervertebral lumbar segments: the Wallis system. *Eur Spine J*. 2002; 11 Suppl 2:S164–9.
12. Senegas J, Vital JM, Pointillart V, Mangione P. Long-term actuarial survivorship analysis of an interspinous stabilization system. *Eur Spine J*. 2007;16(8): 1279–87.
13. Hondras MA, Long CR, Cao Y, Rowell RM, Meeker WC. A randomized controlled trial comparing 2 types of spinal manipulation and minimal conservative medical care for adults 55 years and older with subacute or chronic low back pain. *J Manipulative Physiol Ther*. 2009;32(5):330–43.
14. Bronfort G, Haas M, Evans RL, Bouter LM. Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. *Spine J*. 2004;4(3):335–56.
15. Assendelft WJ, Morton SC, Yu EL, Suttorp MJ, Shekelle PG. Spinal manipulative therapy for low back pain. A meta-analysis of effectiveness relative to other therapies. *Ann Intern Med*. 2003;138(11):871–81.

Publish with Libertas Academica and every scientist working in your field can read your article

“I would like to say that this is the most author-friendly editing process I have experienced in over 150 publications. Thank you most sincerely.”

“The communication between your staff and me has been terrific. Whenever progress is made with the manuscript, I receive notice. Quite honestly, I’ve never had such complete communication with a journal.”

“LA is different, and hopefully represents a kind of scientific publication machinery that removes the hurdles from free flow of scientific thought.”

Your paper will be:

- Available to your entire community free of charge
- Fairly and quickly peer reviewed
- Yours! You retain copyright

<http://www.la-press.com>