

Lumbosacral Junctional Failures After Long Spinal Fusion for Adult Spinal Deformity—Which Vertebra Is the Preferred Distal Instrumented Vertebra?

Tatsuya Yasuda, MD^{*}, Tomohiko Hasegawa, MD, PhD, Yu Yamato, MD, PhD, Sho Kobayashi, MD, PhD, Daisuke Togawa, MD, PhD, Tomohiro Banno, MD, Hideyuki Arima, MD, Shin Oe, MD, Yukihiro Matsuyama, MD, PhD

Department of Orthopaedic Surgery, Hamamatsu University School of Medicine, 1-20-1 Handayama, Higashi-ku, Hamamatsu, 431-3192, Japan

Received 23 July 2015; revised 4 February 2016; accepted 5 March 2016

Abstract

Study Design: A retrospective study.

Object: To investigate the rate of lumbosacral junction complication after long corrective spinal fusion for degenerative kyphoscoliosis cases with different lower instrumented vertebra (LIV) of L5, S1 (non-iliac group), and ilium (iliac group).

Summary of Background Data: In long spinal fusion, high mechanical stress is concentrated at the fusion ends, especially at the lumbosacral junction. There are conflicting views regarding the selection of lower instrumented vertebra in long spinal fusion for adult spinal deformity.

Methods: This study included 53 adult patients who underwent posterior long corrective fusion (more than five levels) for their spinal kyphoscoliosis with a minimum 2 years' follow-up. The patients were divided into two groups: distal fusion level was L5, S1 (non-iliac group), or ilium (iliac group). We investigated the complication status (L5/S1 instability, pseudoarthrosis, screw loosening, sacral fracture, and rod fracture) in the lumbosacral junction.

Results: There were 25 patients (L5:6 cases, S1:19 cases) in the non-iliac group and 28 in the iliac group. There was no significant difference in age and preoperative radiographic parameters between the 2 groups. In the non-iliac group, revision surgery was performed in 6 of the 25 cases (24%, LIV L5: 1 case, S: 5 cases). Lumbosacral failure was observed in 3 of 6 cases with LIV at L5 and a radiolucent sign around S1 pedicle screws were observed in 15 of 19 cases in LIV at S. In the iliac group, revision surgery was required because of rod fractures in 2 of 28 cases (7.1%). There was no other major complication in iliac group.

Conclusion: This study showed that a high complication rate at the lumbosacral junction was observed when the L5 or S1 was selected as the distal fusion end in long corrective fusion. On the other hand, the lumbosacral complication rate was low when using iliac screw as the lower fusion end. Thus, we recommend spinopelvic fixation using iliac screw as the lower fusion end of long corrective fusion for the adult spinal deformity surgery, with the high rate of failure in our patients with long fusions stopped at L5 and S1.

© 2016 Scoliosis Research Society.

Keywords: Adult spinal deformity; Long spinal fusion; Lumbosacral junction failure; Lower instrumented vertebra

Introduction

Multilevel spinal instrumented constructions are frequently necessary for the treatment of adult spinal deformity. In this long spinal fusion, high mechanical

stress is concentrated at the fusion ends, especially at the lumbosacral junction.

There is a debate regarding the selection of the distal fusion level for adult spinal deformity. Ending at L5 offers the preservation of L5–S1 motion segment, although this may result in subsequent L5–S1 disc degeneration. Subsequent disc degeneration is often associated with loss of sagittal balance.

Extension of the lower fusion end to S1 eliminates the possibility of L5–S1 disc degeneration. However, fusion end at S1 is frequently associated with a higher possibility of pseudoarthrosis. Utilization of an iliac screw would provide rigid fixation at the lumbosacral junction. However,

Author disclosures: TY (none), TH (none), YY (none), SK (none), DT (none), TB (none), HA (none), SO (none), YM (none).

^{*}Corresponding author. Department of Orthopaedic Surgery, Hamamatsu University of Medicine, 1-20-1 Handayama, Higashi-ku, Hamamatsu, 431-3192, Japan. Tel.: (8153) 435-2299; fax: (8153) 435-2296.

E-mail address: t.yasuda0820@gmail.com (T. Yasuda).

extended fusion to the ilium is more invasive compared with fusion end at L5 or S1.

There were a few reports about lumbosacral failure after long spinal fusion [1]. Previous reports had several limitations, including varying range of spinal fusion, and/or different surgical techniques used for deformity correction.

The objective of this study was to investigate the lumbosacral junction failures after corrective long fusion for lumbar degenerative kyphoscoliosis cases and compare the incidence

of distal junctional complication among the cases with different lower instrumented vertebra (LIV) of L5, S1, or ilium.

Methods

This study was approved by the Ethics Committee of the Hamamatsu University School of Medicine.

The subjects were 184 adult patients who underwent long corrective fusion surgery for their deformity. Inclusion

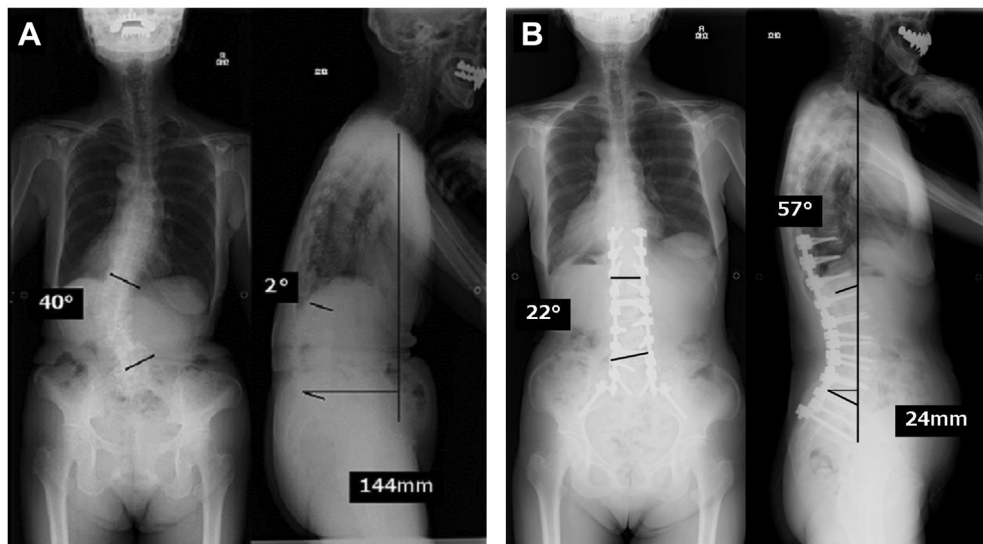
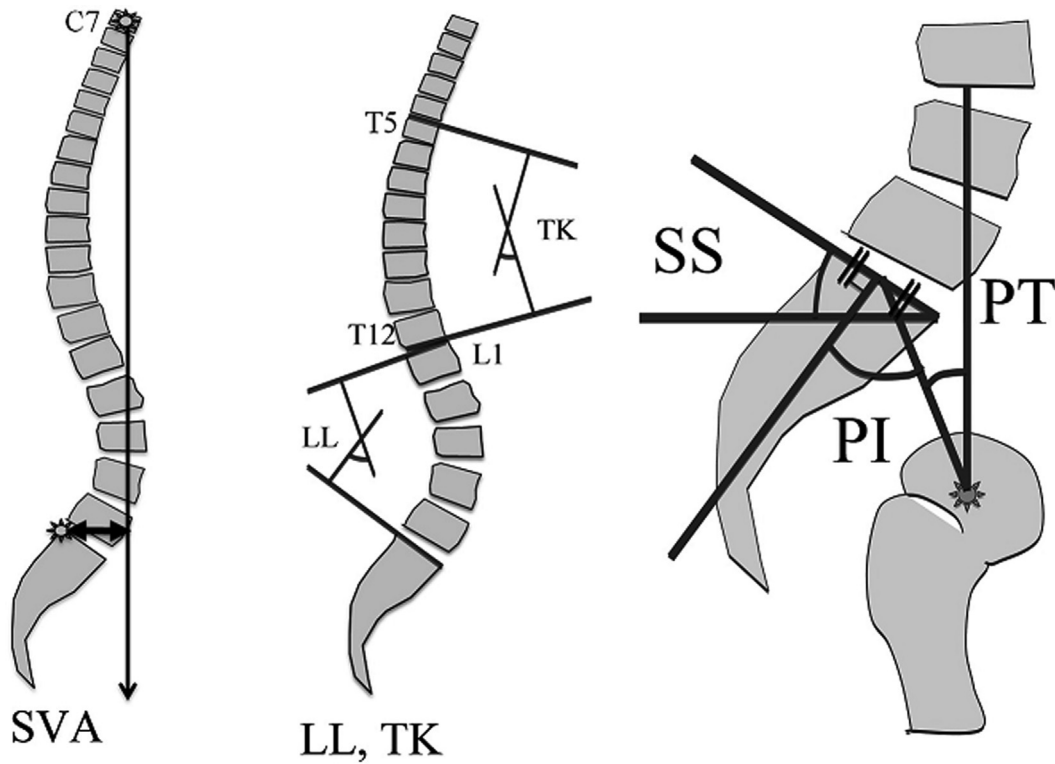


Fig. 1. Iliac screw case. (A) Preoperative whole spine radiographs of a 69-year-old woman with kyphoscoliosis taken in standing position. Coronal Cobb angle (lumbar curve) was 40 degrees, lumbar lordosis was 2 degrees, and sagittal vertical axis (SVA) was 144 mm. (B) Postoperative whole spine radiographs taken in standing position. This patient underwent posterior corrective fusion surgery from T10 to the ilium using iliac screws. Coronal Cobb angle (lumbar curve) was 22 degrees, lumbar lordosis was 57 degrees, and SVA was 24 mm.

Download English Version:

<https://daneshyari.com/en/article/4095201>

Download Persian Version:

<https://daneshyari.com/article/4095201>

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