

# Does Arthrodesis Stopping at L5 Cause Sagittal Decompensation?

Hyung-youl, Park,

Kee-Yong Ha,

Young-Hoon Kim,

Sang-Il Kim,

Joo-Hyun Ahn,

Jae-Won Lee

**Department of  
Orthopaedic Surgery**

**Seoul St. Mary's  
Hospital, College of  
Medicine,**

**The Catholic University  
of Korea, Seoul, Korea**

## Introduction

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No funds or benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this study

## Introduction

# The fate of floating fusion

Higher rate of revision for adult spinal deformity

Degenerative change (58 – 69%)

Sagittal imbalance

Risk factors : long fusion to upper thoracic, A-P fusion

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## Purpose of our study

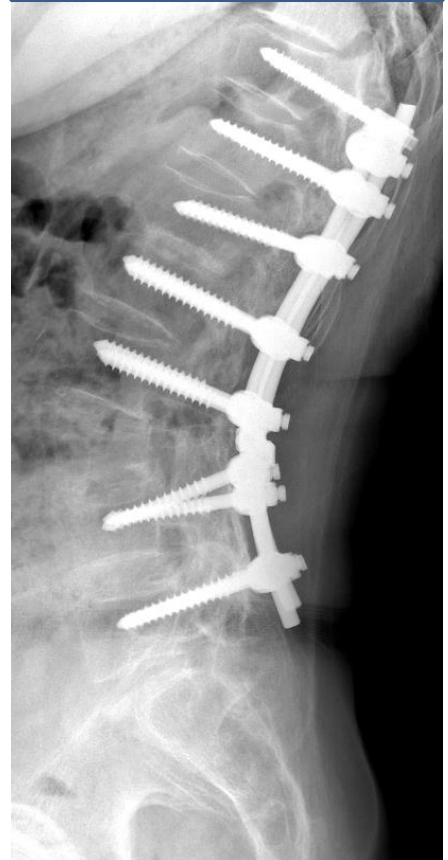
To identify a correlation between

L5-S1 disc degeneration (MRI findings) and

sagittal decompensation after long fusion stopping at L5.

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## Floating fusion



## Materials and Methods

### Study population

#### L5 floating fusion

2004-2014, single institute

**Inclusion** : Degenerative lumbar deformity  
Healthy disc at L5-S1

#### Exclusion criteria

History of surgery at L5-S1  
Sacralization of L5

**32 patients (M:F = 8:24)**

Mean age 68.7 years

Mean F/U periods 4.3 months

### SAD definition

**Healthy L5-S1 disc on X-ray  
and MRI**

**Subsequent  
advanced  
degeneration (SAD)**

Weiner 0-1  
& Pfirrmann  
1-3



Weiner 2-3

**Non-SAD**

Weiner 0-1  
& Pfirrmann  
1-3



Weiner 0-1

## Results

### Demographics

	SAD (n=8)	Non-SAD (n=24)	<i>P</i>
Age at the surgery	70.1 ± 6.2	68.2 ± 6.8	NS
Gender (M:F)	1:7	7:17	NS
BMI	26.8 ± 2.1	27.2 ± 3.0	NS
T-score	-3.1 ± 0.5	-2.7 ± 1.1	NS
Smoking	37.5%	20.8%	NS
Deeply seated L5	25%	12.5%	NS
Fused segments	5.1 ± 1.4	4.4 ± 1.0	NS
UIV	D10:2, D11:1, D12:1, L1:4	D10:3, L1:21	NS

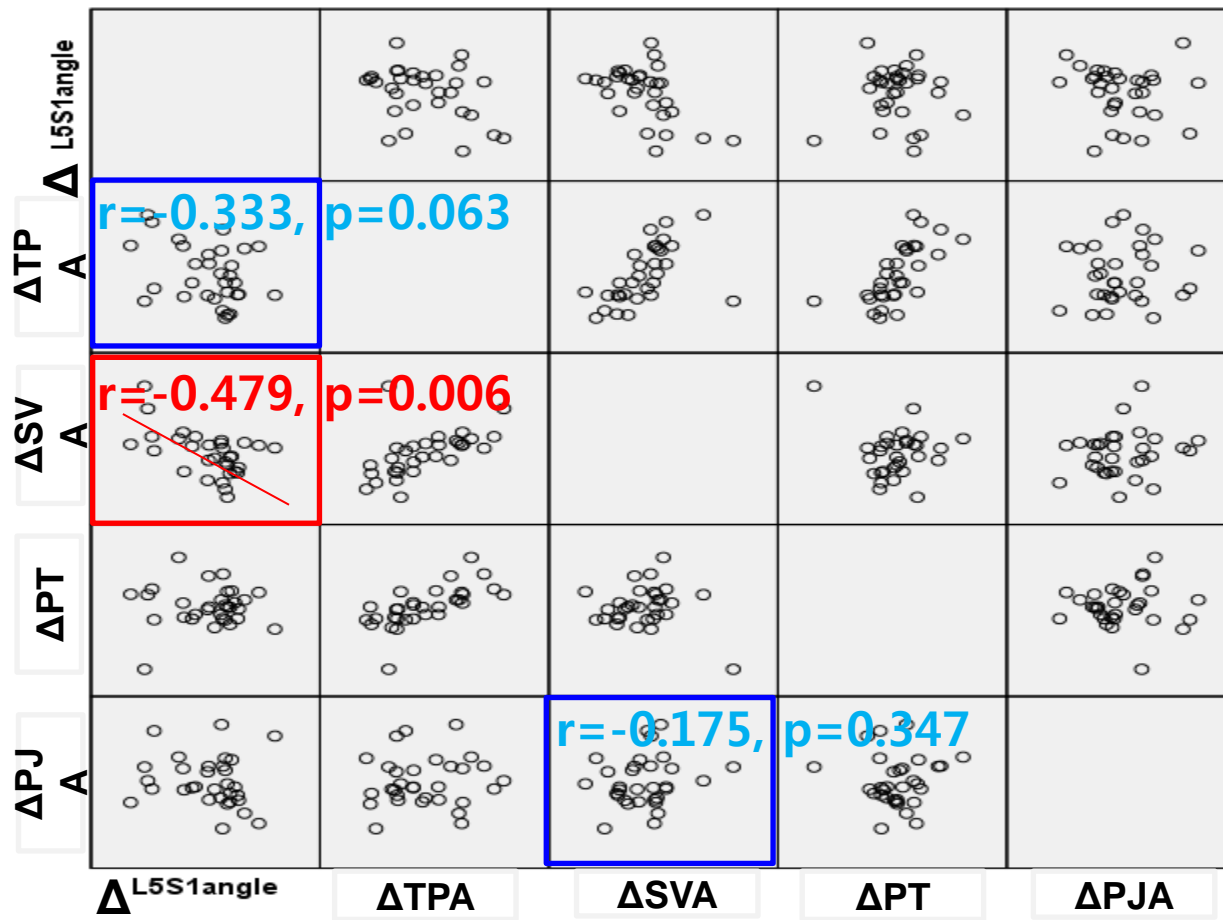
## Results

### Radiologic features

	SAD (n=8)	Non-SAD (n=24)	P
Pfirrmann grade	2.1 ± 0.5	2.0 ± 0.6	NS
Preop PI	53.5°±10.3	56.5°±10.2	NS
Preop PT	27.9°±14.6	23.8°±9.5	NS
Preop LL	17.4°±15.9	33.3°±14.2	0.026
Preop SVA	7.8cm±8.3	5.4cm±2.9	NS
Postop PT	27.9°±6.9	24.1°±10.5	NS
Postop LL	28.9°±7.8	37.2°±11.1	0.049
Postop SVA	3.3cm±3.7	3.4cm±3.4	NS
ΔLL	11.5°±11.6	4.0°±14.0	NS
Last PT	29.7°±8.2	26.1°±9.9	NS
Last PJA	11.5°±12.2	14.2°±8.6	NS
Last LL	18.9°±11.1	33.5°±13.2	0.010
Last SVA	11.3cm±7.8	5.5cm±4.3	0.032

# Results

## Correlation analysis



# Results

## Pre-operative

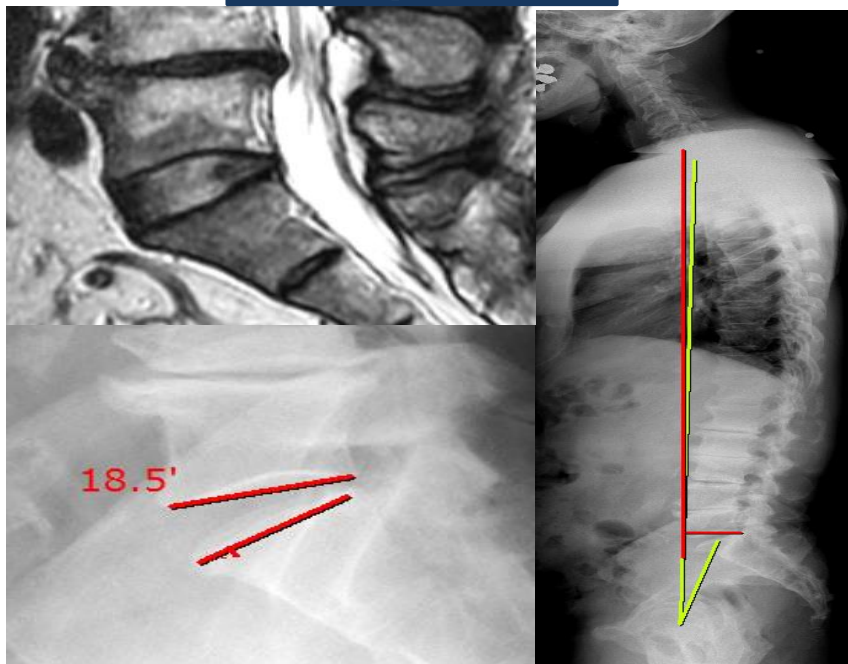


Fig.1. A 70-year-old male patient presented with sagittal vertical axis (SVA) 4cm, healthy L5-S1 disc (Weiner classification; 1, L5-S1 angle; 18.5°, Pfirrmann; II, PJA; 11.6°)

## Post-operative 5 year later

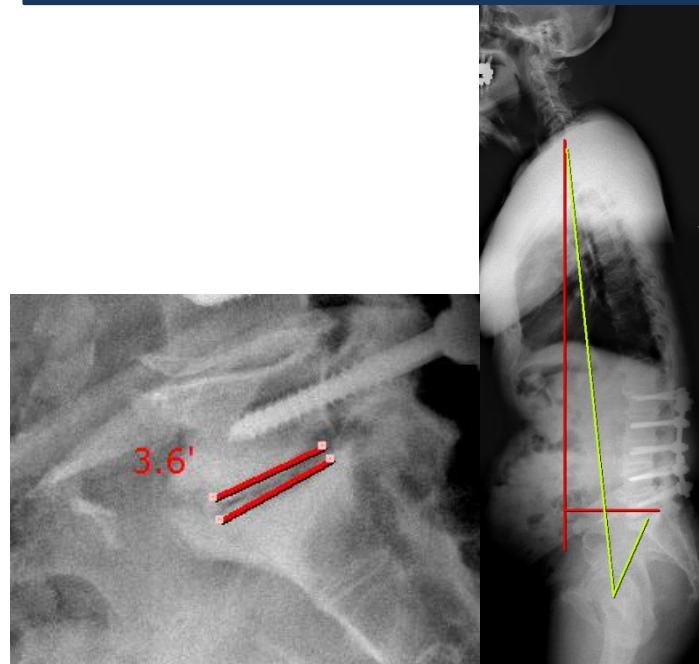
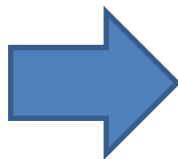


Fig.2. After 5-years after floating fusion, degenerative change and sagittal imbalance were observed (SVA ;8cm, L5-S1 angle; 3.6°, weiner classification; 4, PJA; 15.1°).



## Conclusion

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### L5-S1 disc and floating fusion

In terms of sagittal decompensation,

Correlation with  **$\Delta$ L5-S1 angle** and  **$\Delta$ SVA**