

**Clinical and radiological predictive factors  
to be related with the degree of lumbar  
back muscle degeneration :  
difference by gender**

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# Introduction

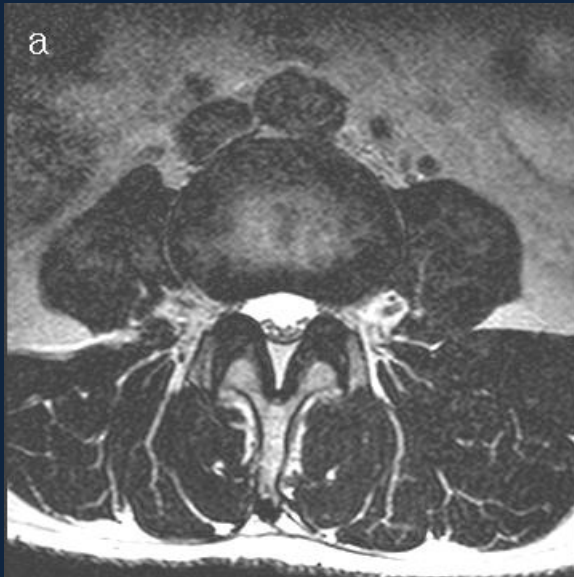
- The study about lumbar back muscle degeneration is clinically significant.
- The consideration of gender difference is also important.
- The purpose of this study is to search clinical and radiological factors to predict the degree of lumbar back muscle degeneration by different gender group.

# Materials

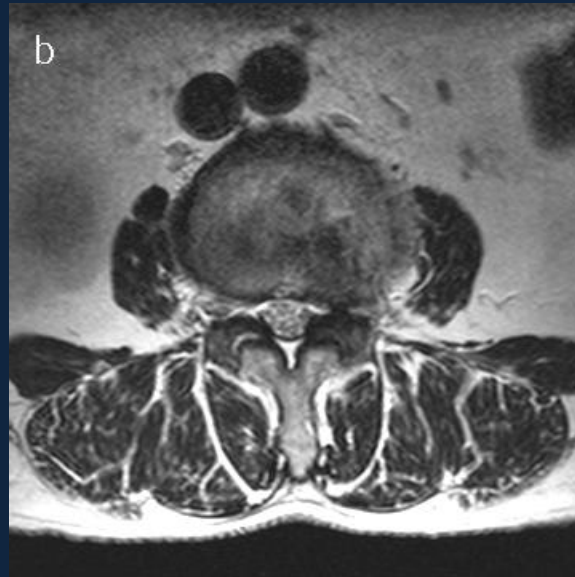
- Retrospective case series
- 112 Patients (M:44, F:68) with spinal stenosis who underwent decompressive surgeries.
- Jan. 1, 2009 ~ Dec. 31, 2011
- Previous back surgery, NM disease, infection-> excluded
- Demographic data : age, sex, height, weight, BMI
- BMD (Bone marrow density) score
- Lumbar spine standing lateral radiographs in neural position
- MRI: 1.5T scanner (Intera Achieva, Philips, The Netherlands)

# Methods (1)

- The degree of lumbar back m. degeneration



FI < 10%



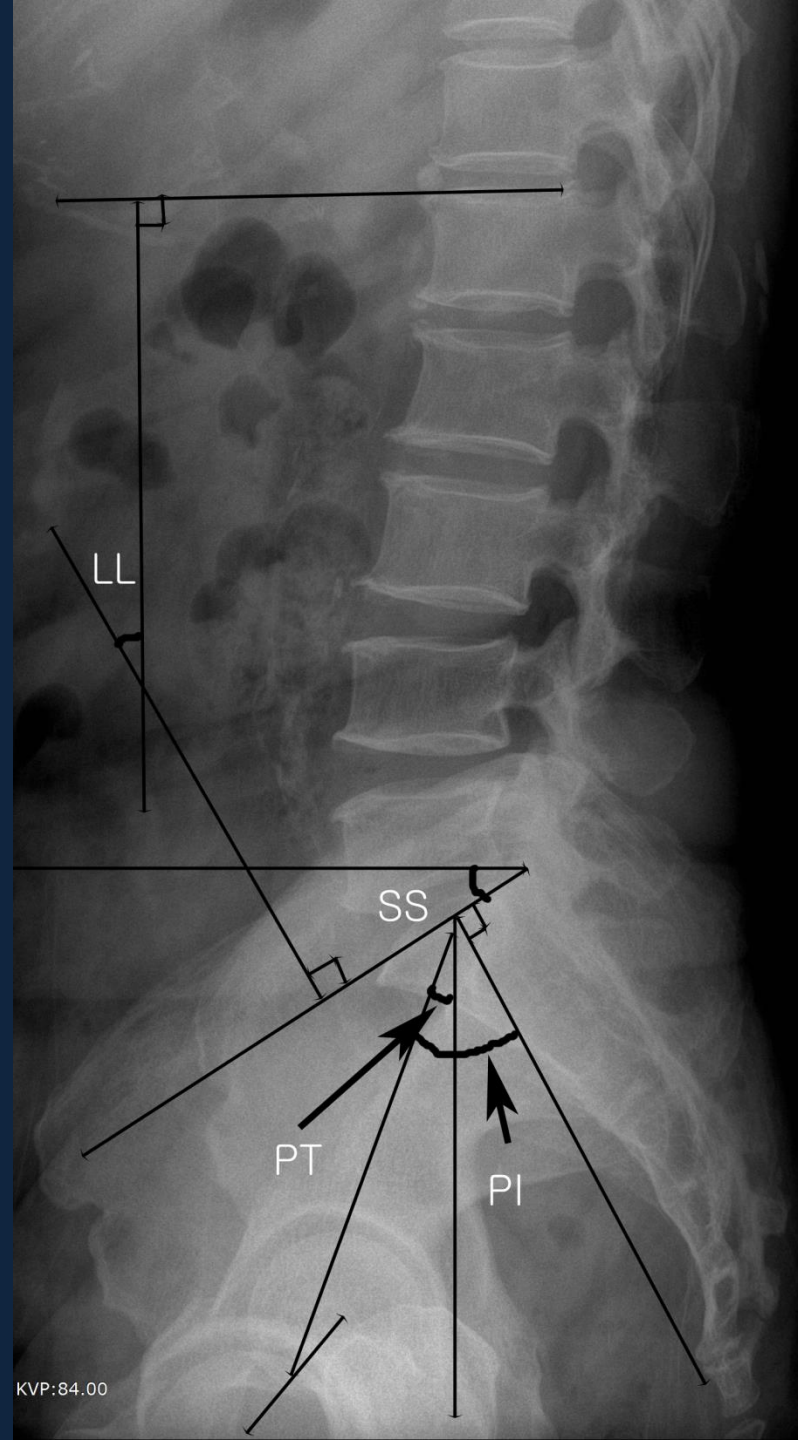
10% < FI < 50%



FI > 50%

# Methods

- Spino-pelvic parameters
  - LL: Lumbar Lordosis
  - SS: Sacral Slope
  - PT: Pelvic Tilt
  - PI: Pelvic Incidence



# Methods (3)

- The degree of spinal stenosis
  - 4 grade system with MRI
    - *Schizas et al. Spine. 2010*
- The degree of facet arthropathy
  - 4 grade system with MRI
    - *Fujiwara et al. Eur Spine J. 1999*

# Methods (4)

- To compare clinical and radiological parameters between male and female
  - Student t-test, chi-square test, Fisher's exact test
- To search relationship between the degree of lumbar back m. degeneration and possible related factors in each gender group
  - ANOVA
  - Linear regression analysis

# Results (1)

	Male (N=44)	Female (N=68)	p-value
Age (yr)	68.4±6.9	68.4±7.0	0.963
BMD score (T-score)	-0.91±1.48	-1.50±1.32	0.035
BMI (kgm <sup>-2</sup> )	24.93±2.97	27.07±3.89	0.003
PI (degree)	45.0±10.2	49.5±10.3	0.027
PT (degree)	17.4±8.8	23.8±8.9	<0.001
SS (degree)	27.7±9.4	26.1±9.4	0.375
LL (degree)	39.4±12.4	32.1±13.6	0.005
The degree of spinal stenosis	2.52±1.19	2.49±1.07	0.863
The degree of facet arthropathy	2.68±1.01	2.59±0.98	0.626
FI grade	1.43±0.66	2.15±0.78	<0.001



# Results (2)

- The clinical and radiological factors by grade of FI and statistical results to search related factors with FI grade **in male group**.

		Age (yr)	BMD (T-score)	BMI (kgm <sup>-2</sup> )	PI (deg)	PT (deg)	SS (deg)	LL (deg)	Stenosis (grade)	Athropathy (grade)
FI	1	67.0	-0.59	25.1	41.8	15.3	26.5	28.2	2.52	2.48
	2	70.0	-1.81	24.4	52.3	20.3	32.0	42.1	2.64	3.09
	3	74.0	-1.00	25.3	48.5	24.1	24.4	40.9	2.25	3.00
Univariate		0.103	0.099	0.796	0.200	0.074	0.009	0.661	0.862	0.189
Multivariate						0.018				

# Results (3)

- The clinical and radiological factors by grade of FI and statistical results to search related factors with FI grade **in female group**.

		Age (yr)	BMD (T-score)	BMI (kgm <sup>-2</sup> )	PI (deg)	PT (deg)	SS (deg)	LL (deg)	Stenosis (grade)	Athropathy (grade)
FI	1	65.5	-1.35	25.6	46.5	19.0	27.5	34.8	2.56	2.88
	2	67.4	-1.53	26.4	50.4	24.5	26.8	33.0	2.42	2.38
	3	71.3	-1.55	28.7	50.4	26.0	24.4	29.4	2.50	2.62
Univariate		<b>0.019</b>	0.882	<b>0.027</b>	0.430	<b>0.037</b>	0.516	0.427	0.918	0.289
Multivariate		<b>0.013</b>		<b>0.001</b>		<b>0.019</b>				

# Conclusion

- The **PT** was the important predictive factor for lumbar back m. degeneration in both gender.
- The **age** and **BMI** were predictive factors only in female patients.
- Regardless of gender, other spino-pelvic parameters and MRI findings could not be found their relationship with lumbar back m. degeneration.

# Conflict of Interest

- The authors did not receive any benefits or funding from any commercial party related directly or indirectly to the subject of this article.