

**Adjacent disc degeneration and facet joint arthritic  
change after lumbar fusion; Which is more affected?**

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# Study background

- **Adjacent segment pathology (ASP)** include disc degeneration, instability, spinal stenosis, facet degeneration, and deformity, although no formal classification exist.

Kaemer et al, Spine (2012)

- **Facet violation** is an important risk factor for the occurrence of ASP rather than the fusion itself.

Dickerman et al, Acta Orthop (2008)

# Study objective

- To evaluate the incidence and degree of adjacent disc degeneration and facet joint arthritic change after lumbar fusion.
- To discuss the relationship between adjacent disc degeneration and facet joint arthritic change.

# Materials and Methods

- Retrospective case-control study.
- Inclusion: A total of 228 patients who had been treated surgically or medically for lumbar degenerative conditions.  
more than 2-year MRI follow-up.
- Study group: 92 PLF patients  
Control group: 136 non-fusion patients (50 decompression, 86 non-surgery)

# Results

- Demographics

	Fusion (92)	Non-fusion (136)	P
Age (yr)	58 (28-79)	53 (32-79)	0.723
Male gender (%)	38 (41%)	51 (38%)	0.352
MRI follow-up (month)	68.6±22.1	62.1±24.6	0.664
diagnosis	spinal stenosis: 37 spondylolisthesis: 35 instability: 11 HNP: 5 DDD: 4 L2-3: 2 L3-4: 8 L4-5: 55 L5-S1: 27	spinal stenosis: 49 spondylolisthesis: 24 instability: 1 HNP: 25 DDD: 37 L2-3: 4 L3-4: 9 L4-5: 79 L5-S1: 44	0.072
level			
Instrumentation level	1.7 ± 0.9	0	-

# Results

- Baseline disc degeneration

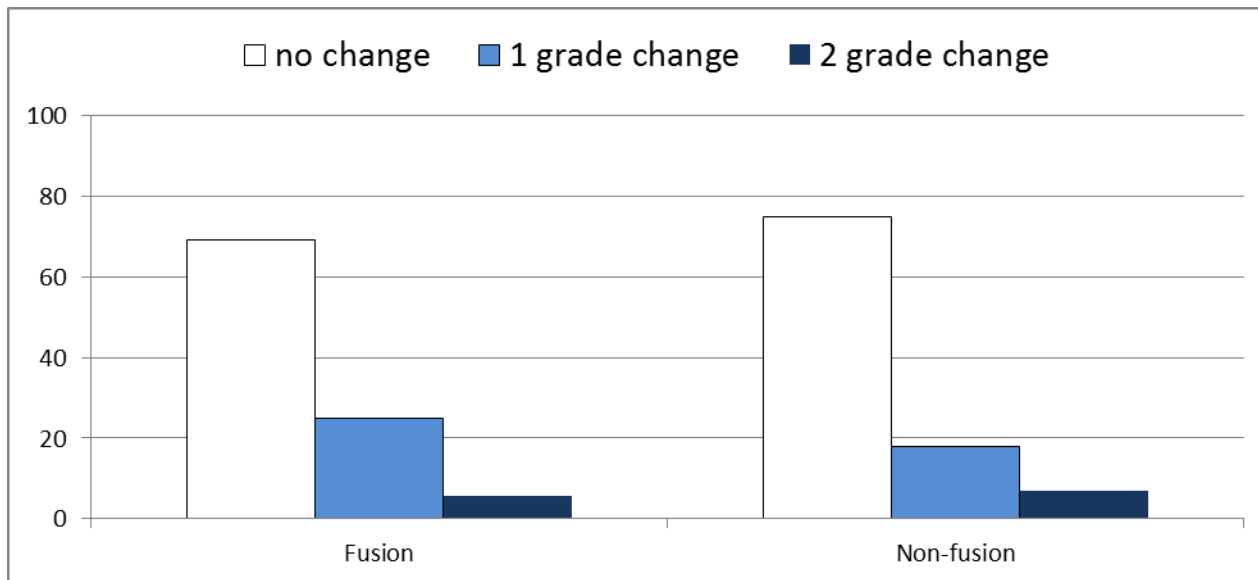
	Fusion (92)	Non-fusion (136)	P
Preop disc degeneration at upper/lower level (Pfirrmann grade)	I: 38/26 II: 24/15 III: 21/14 IV: 9/7 V: 0/3	I: 48/35 II: 29/22 III: 35/23 IV: 16/9 V: 8/6	0.449

- Baseline facet arthritis

	Fusion (92)	Non-fusion (136)	P
Preop facet arthritis at upper/lower level (Fujiwara grade)	I: 39/27 II: 30/19 III: 19/16 IV: 4/3	I: 62/45 II: 38/32 III: 28/11 IV: 8/4	0.357

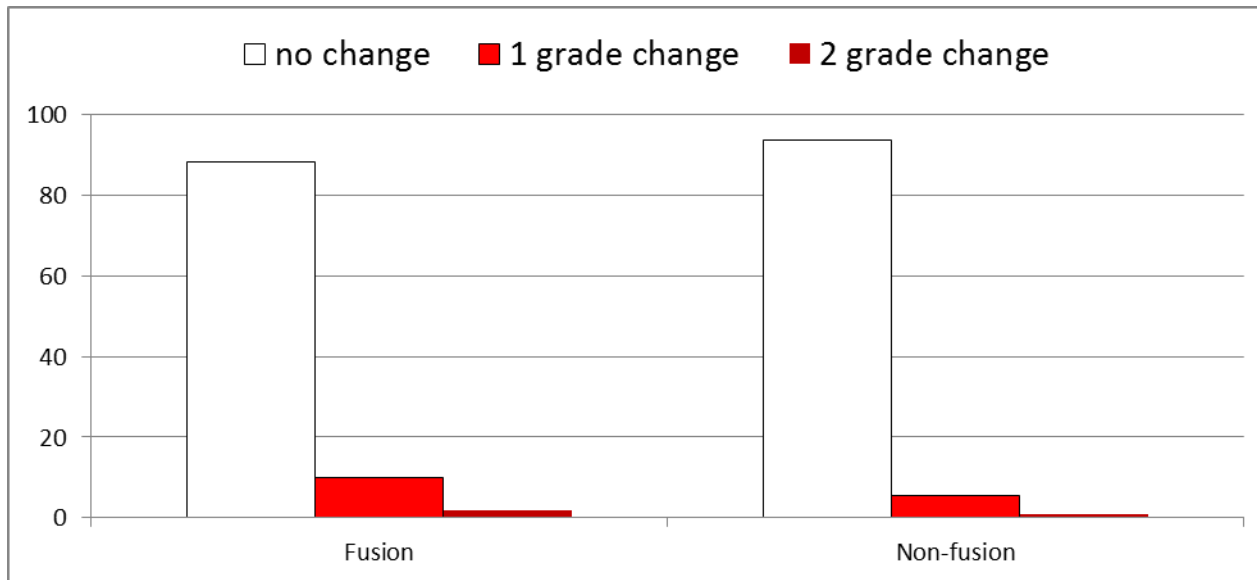
# Results (I)

- Advanced disc degeneration at the upper adjacent level was significantly higher in the fusion group ( $P=0.004^*$ ).



## Results (II)

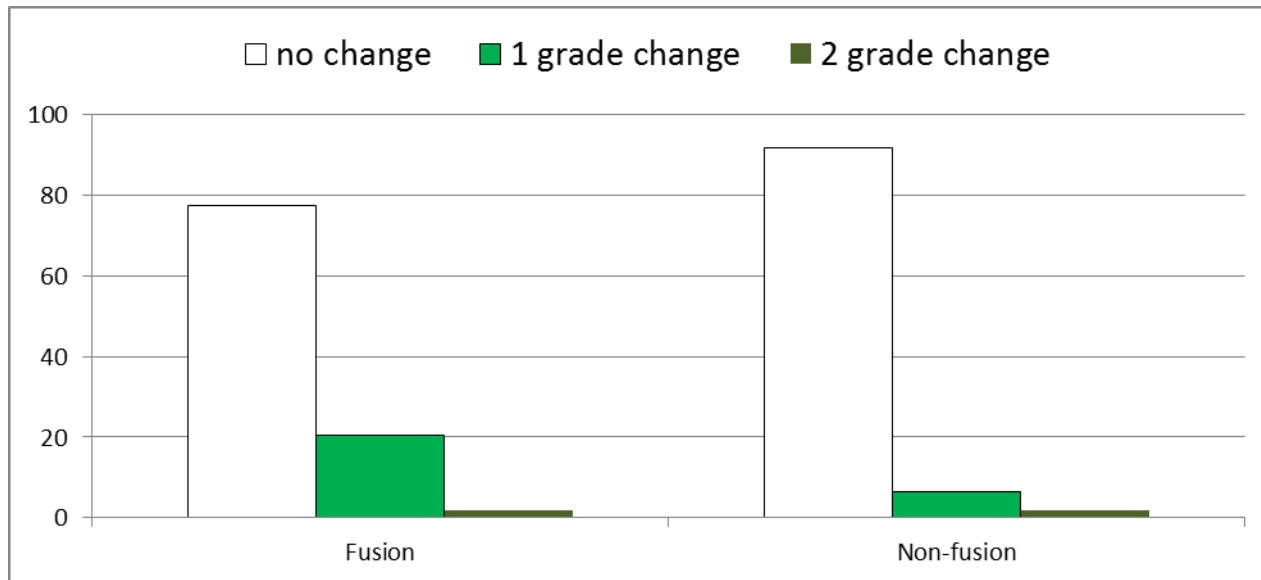
- Advanced disc degeneration at the lower adjacent level was similar between the fusion and non-fusion group ( $P=0.621$ ).





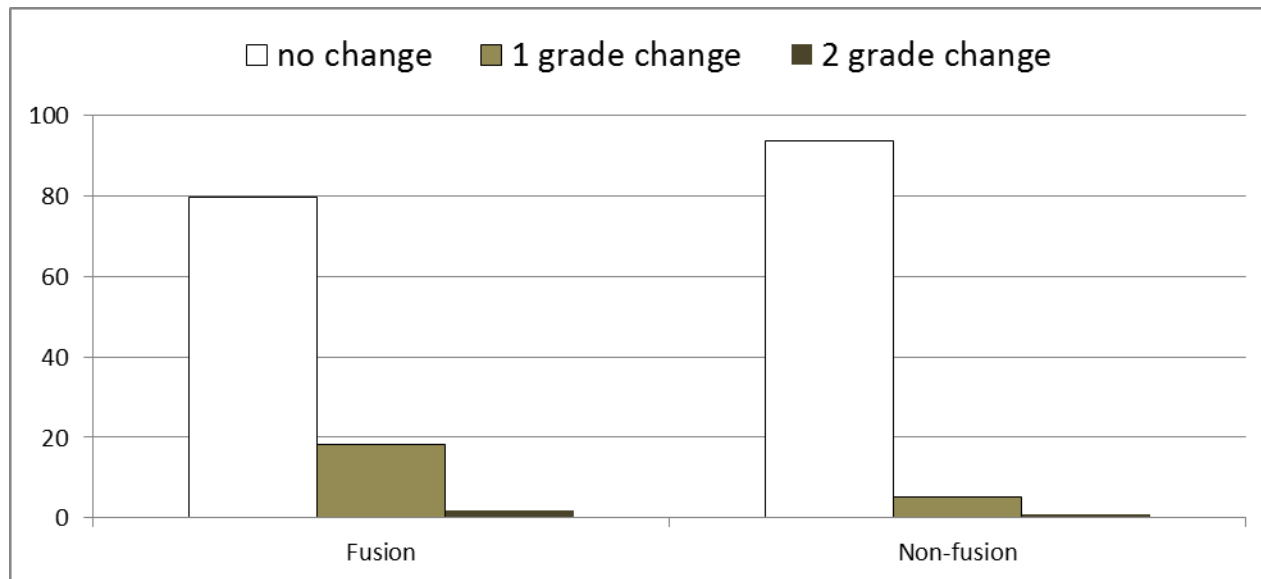
## Results (III)

- Advanced facet arthritic change at the upper adjacent level was significantly higher in the fusion group ( $P=0.022^*$ ).



# Results (IV)

- Advanced facet arthritic change at the lower adjacent level was similar between the fusion and non-fusion group ( $P=0.456$ ).



# Conclusion

- Facet joint arthritic change after lumbar fusion occurred regardless of the adjacent disc degeneration.
- Further investigation including facet joint violation or facet trophism are warranted.

# Disclosure

- nothing to disclose.