

# CLINICAL RESULTS OF DYNAMIC STABILIZATION ADJACENT TO FUSION LEVEL: A NEW LUMBAR HYBRID INSTRUMENTATION

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# P53 - CLINICAL RESULTS OF DYNAMIC STABILIZATION ADJACENT ...

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## Relationships Disclosed

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# INTRODUCTION

- ✓ Traditional materials for the spine such as titanium and stainless steel have produced satisfying long-term fusion rates, mainly due to their strength and stiffness.
- ✓ However, increased stiffness of titanium constructs may also contribute to stress shielding and adjacent segment degeneration.
- ✓ Adjacent segment degeneration is a common (34%) problem following posterior spinal fusions in long term f/up
- ✓ We have been using a new hybrid design with with combination of polyetheretherketone (PEEK) and silicone materials.



- ✓ **Dynamic portion** made of **silicone and PEEK** aiming motion preservation
- ✓ **Fusion portion** is entirely made of **PEEK**.
- ✓ PEEK Rod resulted in lower stress caused by a spinal fusion to the discs adjacent to the fused segments.
- ✓ The fusion portion of the rod distributes load more evenly to the anterior column compared with existing traditional, rigid rods and screws.
- ✓ The non-fusion portion of the rod has a c-shaped section to help control the amount of motion at the adjacent segment while maintaining appropriate durability performance.

# PURPOSE

**To evaluate the efficiency of dynamic portion of the PEEK rod system in preventing adjacent level problems in the surgical treatment of multilevel lumbar degenerative disease**

**To evaluate the efficacy of PEEK rod systems in maintaining fusion at interbody fusion levels**

# MATERIAL & METHODS

## *inclusion criteria*

- ✓ Patients between 20-65 years of age
- ✓ degenerative disc disease or spinal stenosis requiring interbody fusion
- ✓ having grade 2 or > facet joint degeneration and/or having early degenerative changes at the upper adjacent level

# MATERIAL & METHODS

- ✓ 54 patients (28F,26M) with mean age 48 (26-65)
- ✓ 84 levels of TLIF's
- ✓ All surgeries were performed using with **PEEK system**.
- ✓ Preop, postop AP/L x-rays were measured for pelvic and sagittal parameters.
- ✓ Disc angles, ROM, anterior disc height (ADH) and posterior disc height (PDH) were measured for adjacent (AL) and supraadjacent (SAL) levels.
- ✓ All patients were evaluated with EOS images, dynamic x-rays and 3D CT scan at the final f/up.
- ✓ Clinical evaluation was done with ODI and VAS.

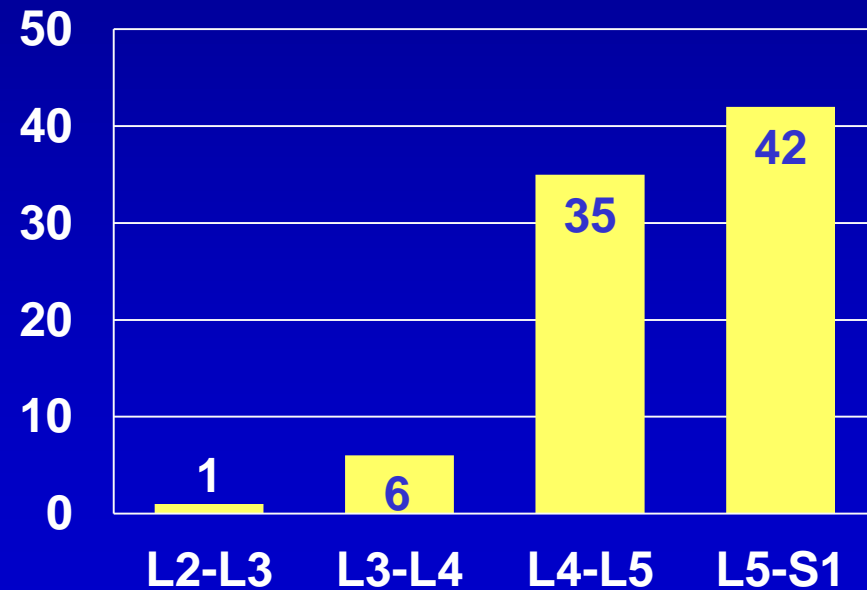
# RESULTS

- ✓ Mean f/up was 26,3 months (24-38)
- ✓ Average instrumentation levels was 3,33 (2-5)
- ✓ Average fused levels was 1,66 (1-3)

## TLIF levels



## TLIF levels



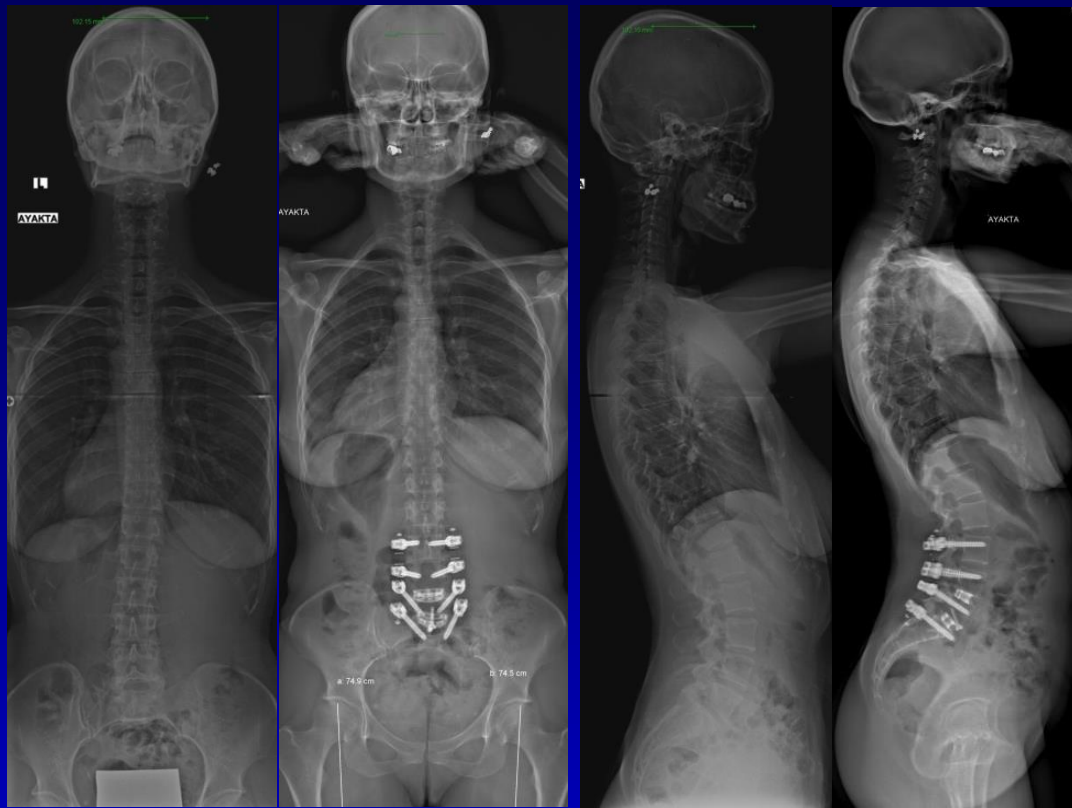


# RESULTS

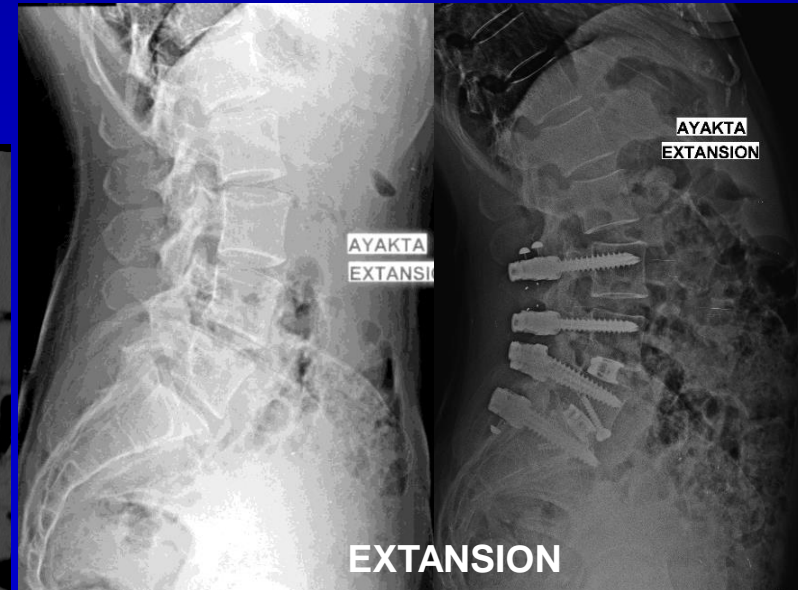
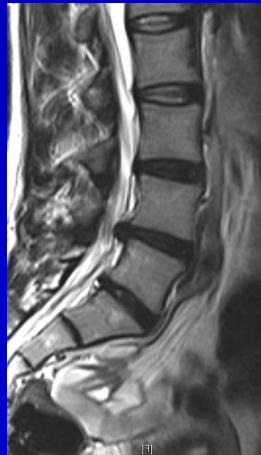
- ✓ Preop LL was restored to 42.7° and 49.3° at final f/up.
- ✓ There were no significant differences in ADH, PDH and disc angles between preop and f/up for AL and SAL levels.
- ✓ Preop average ROM for SAL of 5,85° changed to 6.57° (p>0.05).
- ✓ Preop average ROM of 6,72° was decreased to 5,07° at AL with a limitation of 24,6% Postoperatively (p=0.01)
- ✓ 3D CT evaluation revealed solid fusions for all TLIF levels.
- ✓ Mean of 43,51% ODI was improved to 18,93 and preop VAS score 7,2 was improved to 2,2

		Preoperative Mean ± SD	Postoperative Mean ± SD
Supra-adjacent Level	Flexion	2.29 ± 1.64	2.5 ± 2.73
	Neutral	6.88 ± 3.16	8.06 ± 3.63
	Extension	8.14 ± 2.91	9.07 ± 3.71
	ROM	5.85 ± 1.27	6.57 ± 0.98
Adjacent Level (Dynamic)	Flexion	3.14 ± 2.2	1.64 ± 2.67
	Neutral	8.94 ± 4.23	5.41 ± 2.87
	Extension	9.86 ± 4.11	6.71 ± 3.4
	ROM	6.72 ± 1.91	5.07 ± 0.73
<i>ROM: Range of Motion</i> <i>All values are in degree</i>			

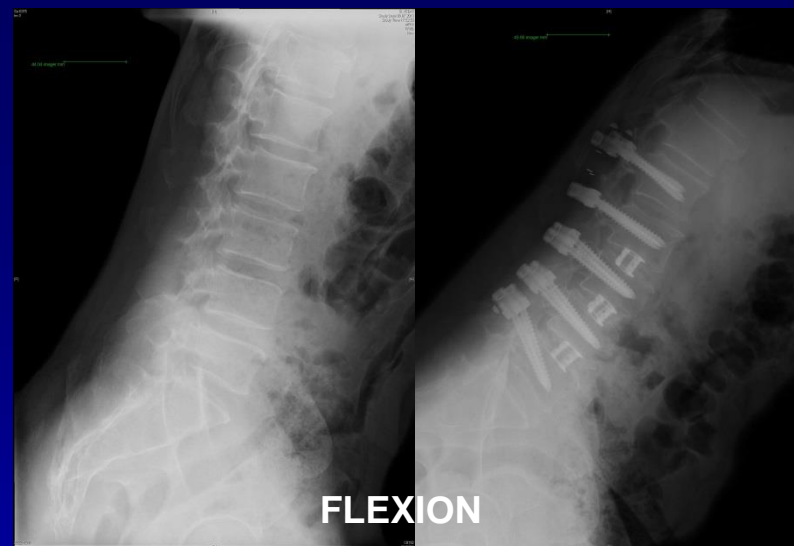
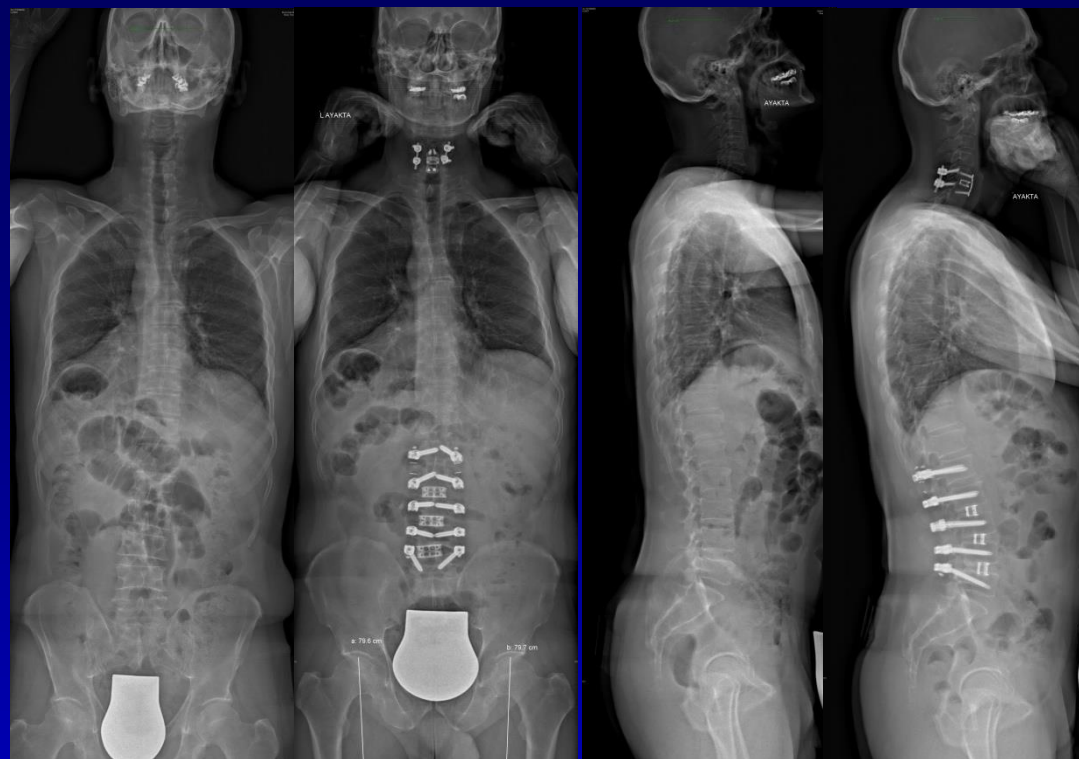
# NO, F, 42Y, L4-5 +L5-S1 TLIF + L3-L4 Dynamic Fixation



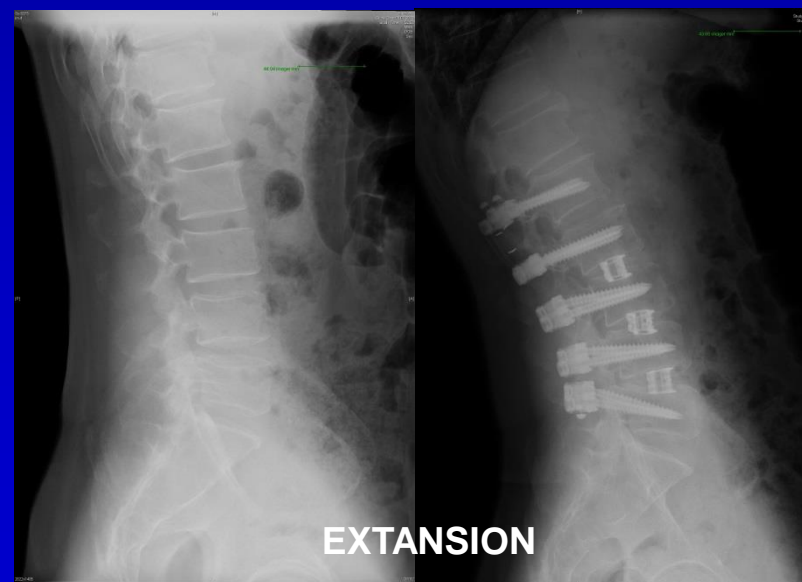
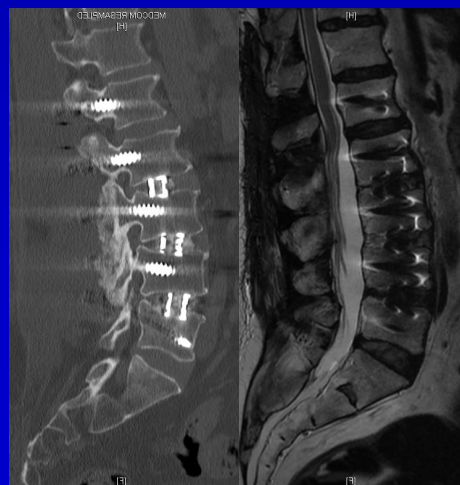
**3 YEARS F/UP**



# VB, M, 58Y. L3-L4 + L4-5 + L5-S1 TLIF + Dynamic Fixation



**2 YEARS F/UP**



# CONCLUSION

**New hybrid lumbar instrumentation with PEEK rod system is effective in the treatment of multilevel degenerative lumbar disc disease.**

**Dynamic portion of the hybrid system limits ROM by 24.6% at adjacent level. AL and SAL did not demonstrate any significant facet or disc degeneration at the end of minimum 2 years follow-up.**