2021 California Orthopaedic Association Annual Meeting

Severity and Location of Lumbar Spine Stenosis Affects the Outcome of Total Knee Arthroplasty

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No related disclosures

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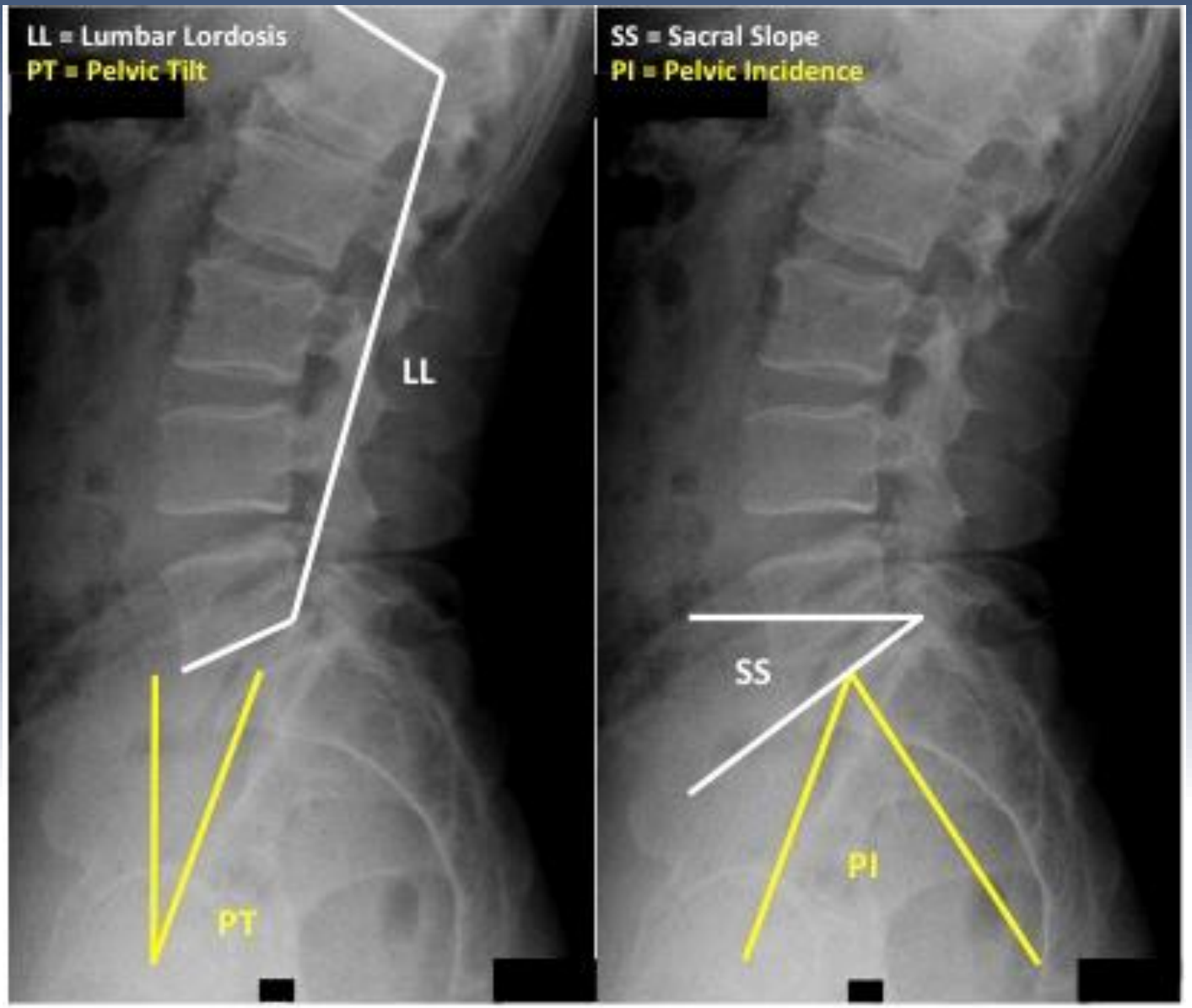
Lumbar Spine Sagittal Mismatch Deformity Negatively Affects Total Knee Arthroplasty Outcomes



PI = SS + PT

Sagittal Imbalance via Mismatch Deformity

- MD =|PI-LL|>10°

Normal Values[1-6]:

PT ~ 10-25°

LL ~ 45 (varies widely)

SS ~ 30-50°

PI ~ 40-65°

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3. Le Huec, J. C., Aunoble, S., Philippe, L., & Nicolas, P. (2011). Pelvic parameters: origin and significance. European Spine Journal: Official Publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society. Springer.
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5. Zhang, H. C., Zhang, Z. F., Wang, Z. H., Cheng, J. Y., Wu, Y. C., Fan, Y. M., … Wang, Z. (2017). Optimal Pelvic Incidence Minus Lumbar Lordosis Mismatch after Long Posterior Instrumentation and Fusion for Adult Degenerative Scoliosis. Orthopaedic Surgery, 9(3), 304–310.
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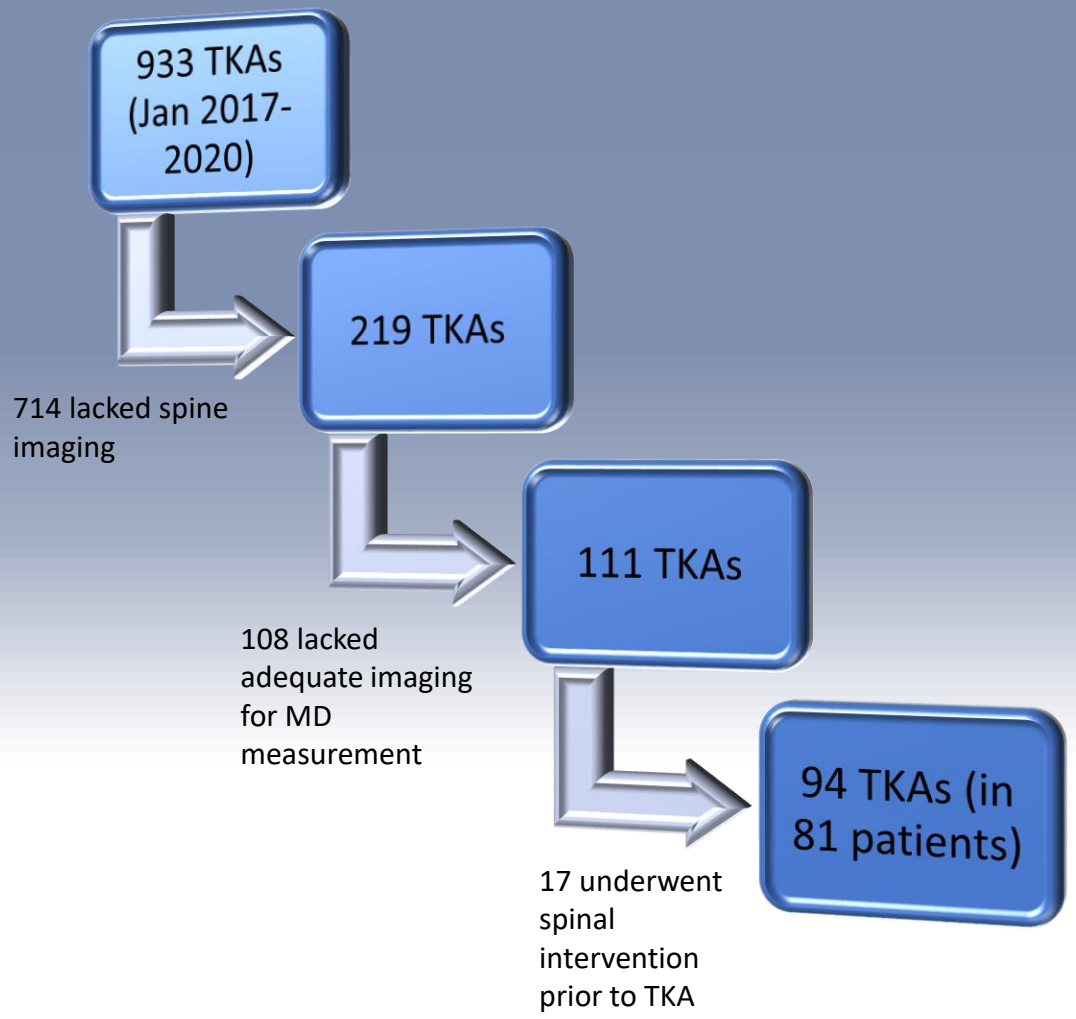
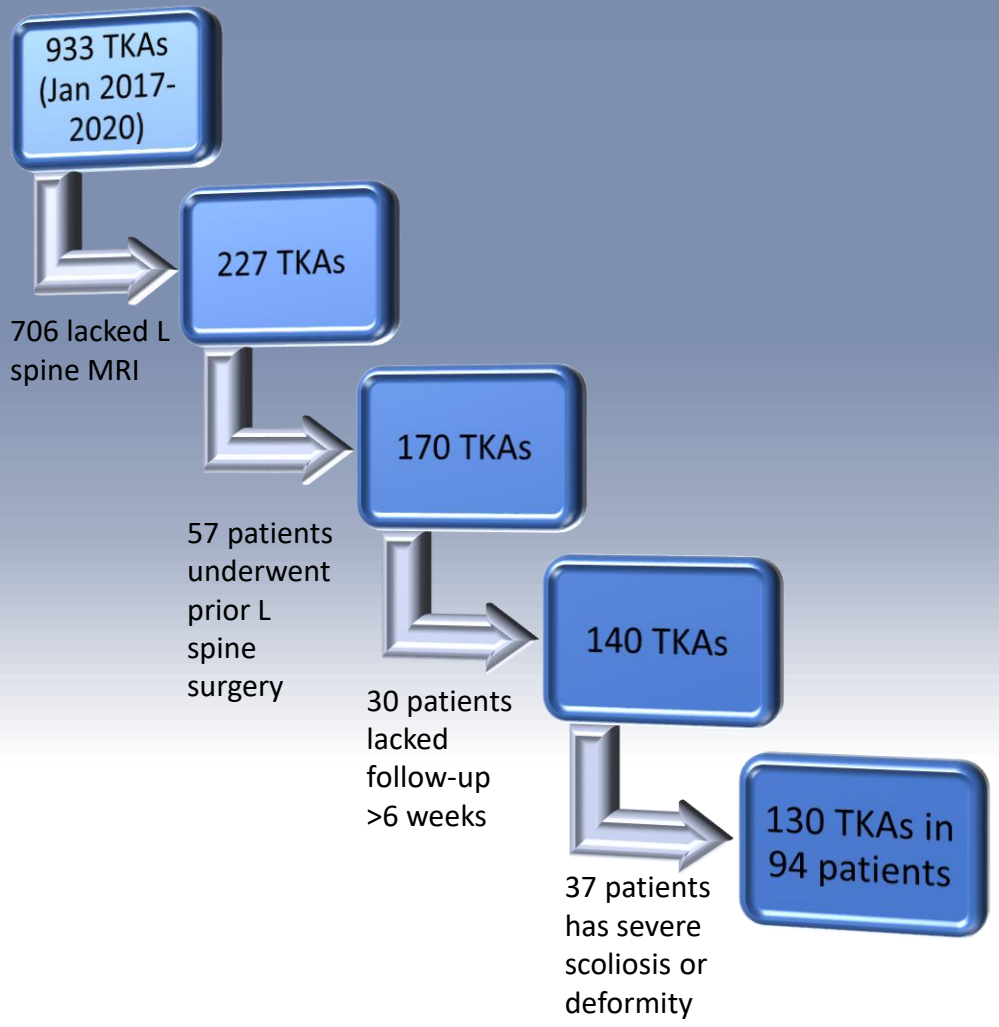
Summary



- 15% of those with MD required MUA
- Mean AOM was 16° less when MD was noted
- 77% of those with MD failed to meet the ROM 0-120 standard
- 23% of those with MD developed a flexion contracture of 6.25°
- There was a 5° reduction in AOM from pre- to post-op for those with MD and a 9.7° increase for those without MD

Does stenosis affect TKA outcomes?



1. Steurer J, Roner S, Gnannt R, Hodler J; LumbSten Research Collaboration. Quantitative radiologic criteria for the diagnosis of lumbar spinal stenosis: a systematic literature review. BMC Musculoskelet Disord. 2011;12:175. Published 2011 Jul 28. doi:10.1186/1471-2474-12-175
2. Guen, Y. L., Joon, W. L., Hee, S. C., Kyoung-Jin, O., & Heung, S. K. (2011). A new grading system of lumbar central canal stenosis on MRI: An easy and reliable method. Skeletal Radiology, 40(8), 1033–1039. https://doi.org/10.1007/s00256-011-1102-x
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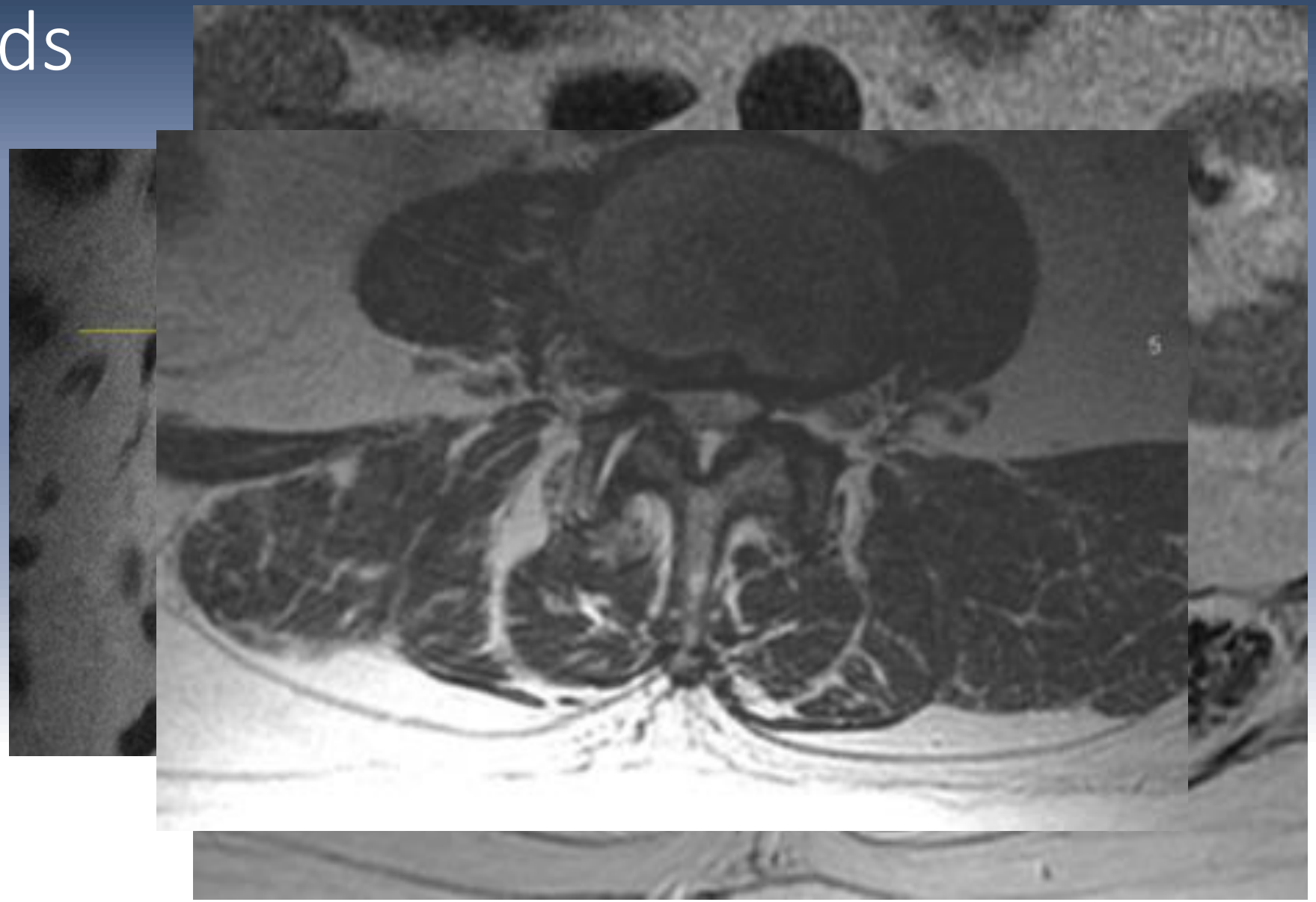
Methods



Results

Preoperative Arc of Motion vs AP diameter

Intervertebral Level	Regression coefficient (p value)
L1-2	17.64 (0.0003)**
L2-3	13.57 (0.0007)**
L3-4	12.37 (0.0011)**
L4-5	10.93 (0.0007)**
L5-S1	4.47 (0.15)
Worst Level of Stenosis	15.76 (8.18e-05)**

Δ Arc of motion vs Grade of Stenosis

Intervertebral Level	Regression coefficient (p value)
L1-2	2.38 (0.36)
L2-3	4.84 (0.02)**
L3-4	1.75 (0.28)
L4-5	2.87 (0.07)
L5-S1	-6.00 (0.69)
Worst Level of Stenosis	2.82 (0.06)

Preoperative Arc of Motion vs Grade of Stenosis

Intervertebral Level	Regression coefficient (p value)
L1-2	-7.18 (0.0005)**
L2-3	-6.76 (4.20e-05)**
L3-4	-5.06 (6.44e-05)**
L4-5	-4.24 (0.0009)**
L5-S1	-4.67 (0.70)
Worst Level of Stenosis	-5.20 (1.22e-05)**

** statistically significant with regression analysis

Discussion/Summary

- As AP diameter decreased OR morphological grade increased at levels L1-2, L2-3, L3-4, and L4-5, there was a significant reduction in preoperative-AOM ($p<0.001$ for each)
- A 16 degree decrease in pre-operative AOM at patients' most stenotic level was noted with decreased AP diameter, which on average was L2-3 ($p<0.001$)
- Similarly with grade, a 5 degree reduction in pre- to post-AOM was noted

Key Point: Severe stenosis correlated with a significant reduction in preoperative-AOM that was not improved after TKA which may contribute to reduced patient satisfaction and recovery.

Thank You!

- Adam Sassoon
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