

DYNAMIC SPONDYLOLISTHESIS: A GAME OF HIDE AND SEEK

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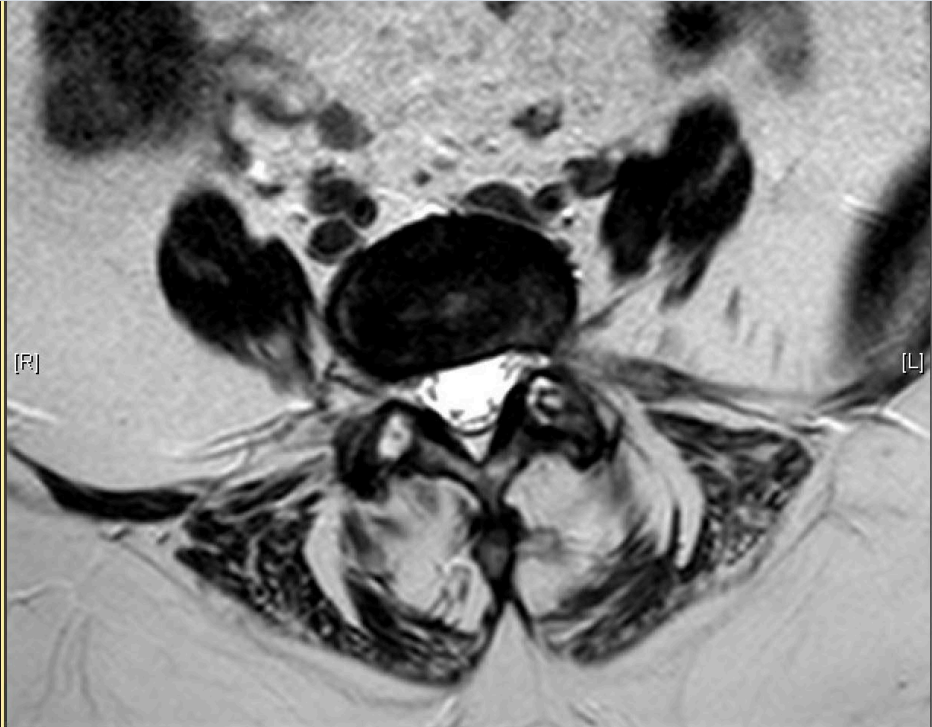
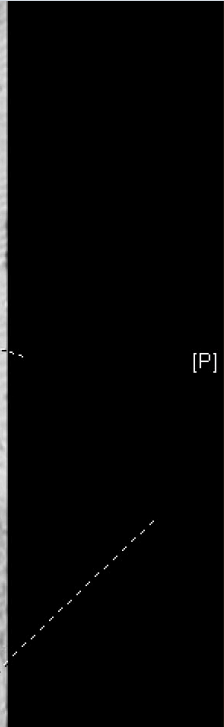
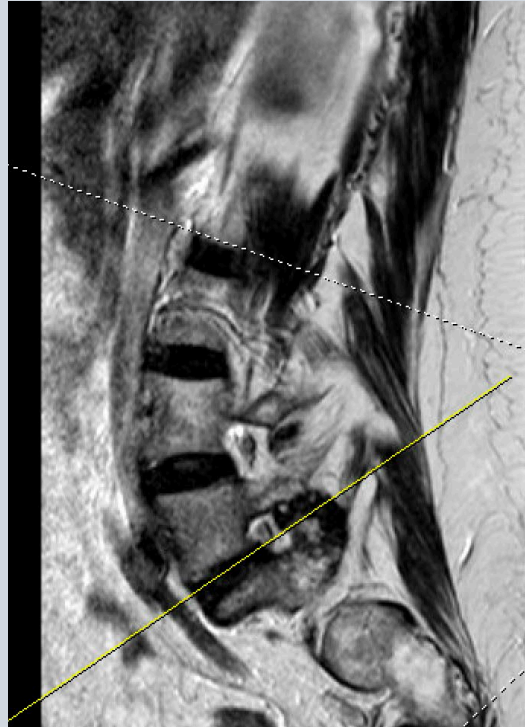
DISCLOSURES

- Mihir Jani: None
- Sandra Yu: None
- Sayed Wahezi:
 - Consultant: Boston Scientific
 - Researcher: Boston Scientific, Vertos, Abbott

CASE:

- 75 Y/O FEMALE PRESENTED WITH LOW BACK PAIN OF MANY YEARS
- LOCALIZED ACROSS LOWER BACK WITH RADIATION TO BILATERAL BUTTOCK AND POSTERIORLY TO THE KNEE
- REFRACTORY TO PHYSICAL THERAPY, GABAPENTIN, CYMBALTA, TYLENOL, AND NSAIDS

- DDX?



Lumbar Facet Fluid—Does It Correlate with Dynamic Instability in Degenerative Spondylolisthesis? A Systematic Review and Meta-Analysis

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Key words

- Dynamic instability
- Facet cyst
- Facet effusion
- Facet fluid
- Lumbar degenerative spondylolisthesis
- Lumbar fixation
- Standing radiographs

Abbreviations and Acronyms

CI: Confidence interval

FF: Facet fluid

LDS: Lumbar degenerative spondylolisthesis

MINORS: Methodological Index for Non-Randomized Studies

MRI: Magnetic resonance imaging

T2W: T2-weighted

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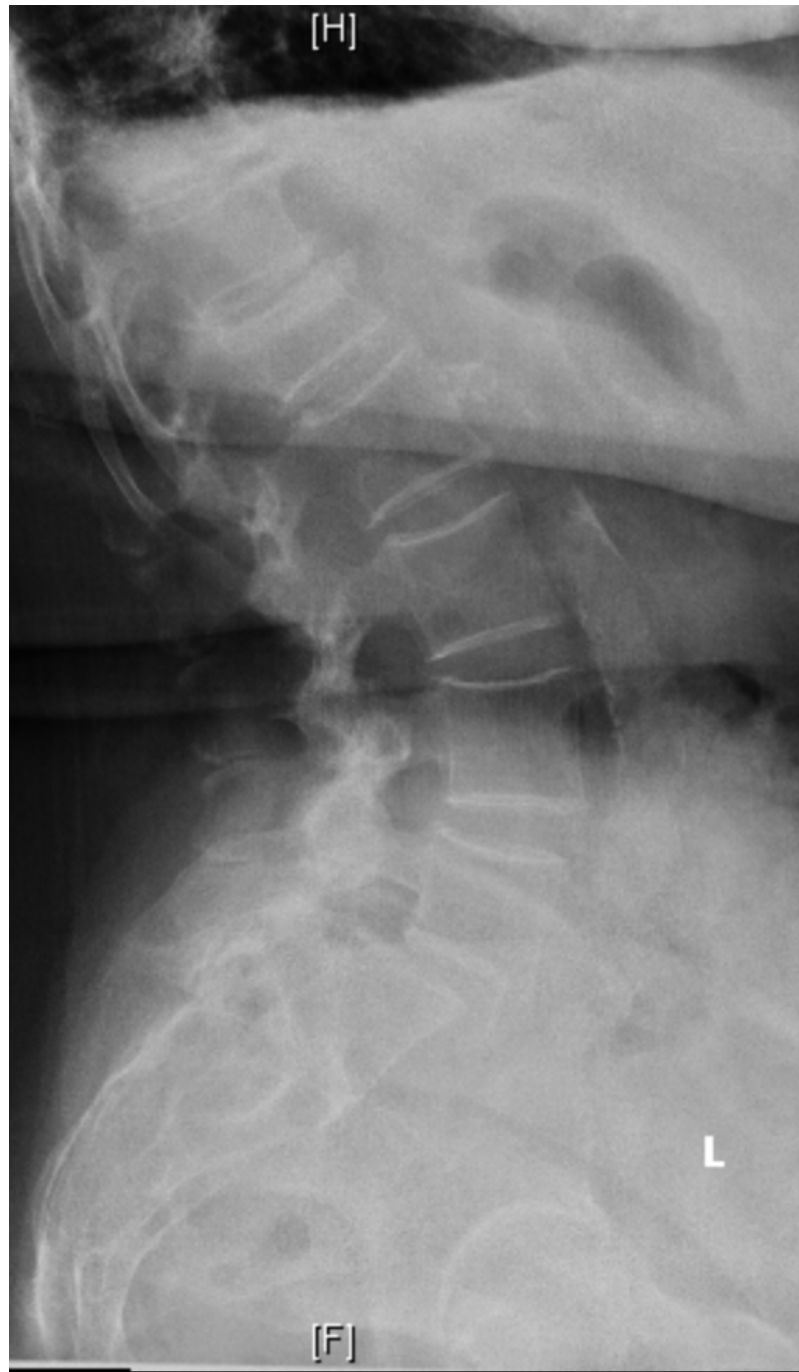
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■ **BACKGROUND:** Lumbar degenerative spondylolisthesis (LDS) is a common spinal disease. LDS has been differentiated into dynamic (unstable) and static (stable) spondylolisthesis. Standing flexion/extension lumbar spine radiographs are the best investigation to detect presence of dynamic spondylolisthesis. Magnetic resonance imaging is the investigation of choice to show lumbar canal stenosis and disc prolapse but it can miss dynamic LDS. Studies have shown good association between presence of facet fluid (FF) and dynamic spondylolisthesis.

■ **METHODS:** A systematic review and meta-analysis were performed. All studies describing the relationship between FF and degenerative spondylolisthesis as measured on dynamic radiographs or kinematic magnetic resonance imaging were included.

■ **RESULTS:** Fourteen articles met the inclusion criteria. A total of 1065 patients were included in the meta-analysis. Of the patients with unstable spondylolisthesis, 71% had FF, whereas only 22% of the patients with stable spondylolisthesis had FF. The combined pooled odds ratio for unstable spondylolisthesis in the presence of FF was 7.55 (3.61–15.08; $P < 0.00001$). The pooled standard mean difference in the FF size in the patients with unstable and stable spondylolisthesis was 0.97 mm (0.38–1.57; $P = 0.001$).

■ **CONCLUSIONS:** FF has positive correlation with the presence of dynamic LDS and the probability of dynamic LDS increases as the size of FF increases. The probability of having a dynamic spondylolisthesis in patients with FF >1 mm is 8 times that of patients with no FF. Standing flexion extension radiographs should be performed in patients with FF >1 mm.



Flexion-extension standing radiographs underestimate instability in patients with single-level lumbar spondylolisthesis: comparing flexion-supine imaging may be more appropriate

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Background: Generally, most spine surgeons agree that increased segmental motion viewed on flexion-extension radiographs is a reliable predictor of instability; however, these views can be limited in several ways and may underestimate the instability at a given lumbar segment.

Methods: Consecutively collected adult (≥ 18 years old) patients with symptomatic single-level lumbar spondylolisthesis were reviewed from a two-surgeon database from 2015 to 2019. Routine standing lumbar X-rays (neutral, flexion, extension) and supine lumbar MRI (sagittal T2-weighted imaging sequence) were performed. Patients were excluded if they had prior lumbar surgery, missing radiographic data, or if the time between X-rays and MRI was >6 months.

Results: All 39 patients with symptomatic, single-level lumbar spondylolisthesis were identified. The mean age was 57.3 ± 16.7 years and 66% were female. There was good intra- and inter-rater reliability agreement between measured values on the presence of instability. The slip percentage (SP) difference was significantly highest in the flexion-supine (FS) (5.7 mm, 12.3%) and neutral standing-supine (NS) (4.3 mm, 8.7%) groups, both of which were significantly higher compared with the flexion-extension (FE) group (1.8 mm, 4.5%, $P < 0.001$). Ventral instability based on $SP > 8\%$ was observed more frequently in FS (79.5%) and NS (52.6%) groups compared with FE group (16.7%, $P < 0.001$). No statistically significant correlation was found between SP and disc angle for all radiographic views.

Conclusions: Comparing standing lateral and flexion X-rays with supine MRIs provides higher sensitivity to assess instability than standard flexion-extension radiographs. The FS and NS comparisons also show greater slip percentage differences at higher slip grades, but not at different lumbar levels. These changes are not dependent on age or gender.