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Among Patients with Stability on Flexion-Extension Radiographs, Pain in Flexion and Extension Does Not Predict Subsequent Intra-operative Instability

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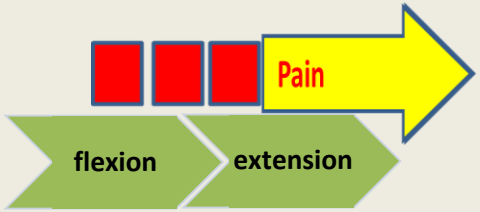
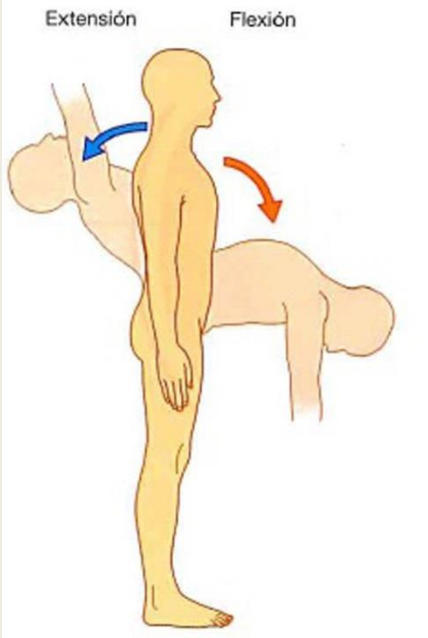
Background

Pain, muscle contraction, and other anatomic features have been hypothesized to limit mobility, and thus result in under-reporting of instability among patients with spondylolisthesis when measured by standard pre-operative flexion-extension radiographs.





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Objectives

Among patients undergoing surgery for L4-L5 lumbar degenerative spondylolisthesis (LDS) our objective was to ascertain if pre-operative symptoms predicted true instability when standard flexion-extension radiographs indicated stability.

Methods

Before surgery:

- Patients completed
  Numerical Pain Rating for back and leg pain (0 = none, 10 = worst)
  Oswestry Disability Index (0 = best, 100 = worst)

- Surgeons reported
  presence of pain on flexion and extension during physical examination

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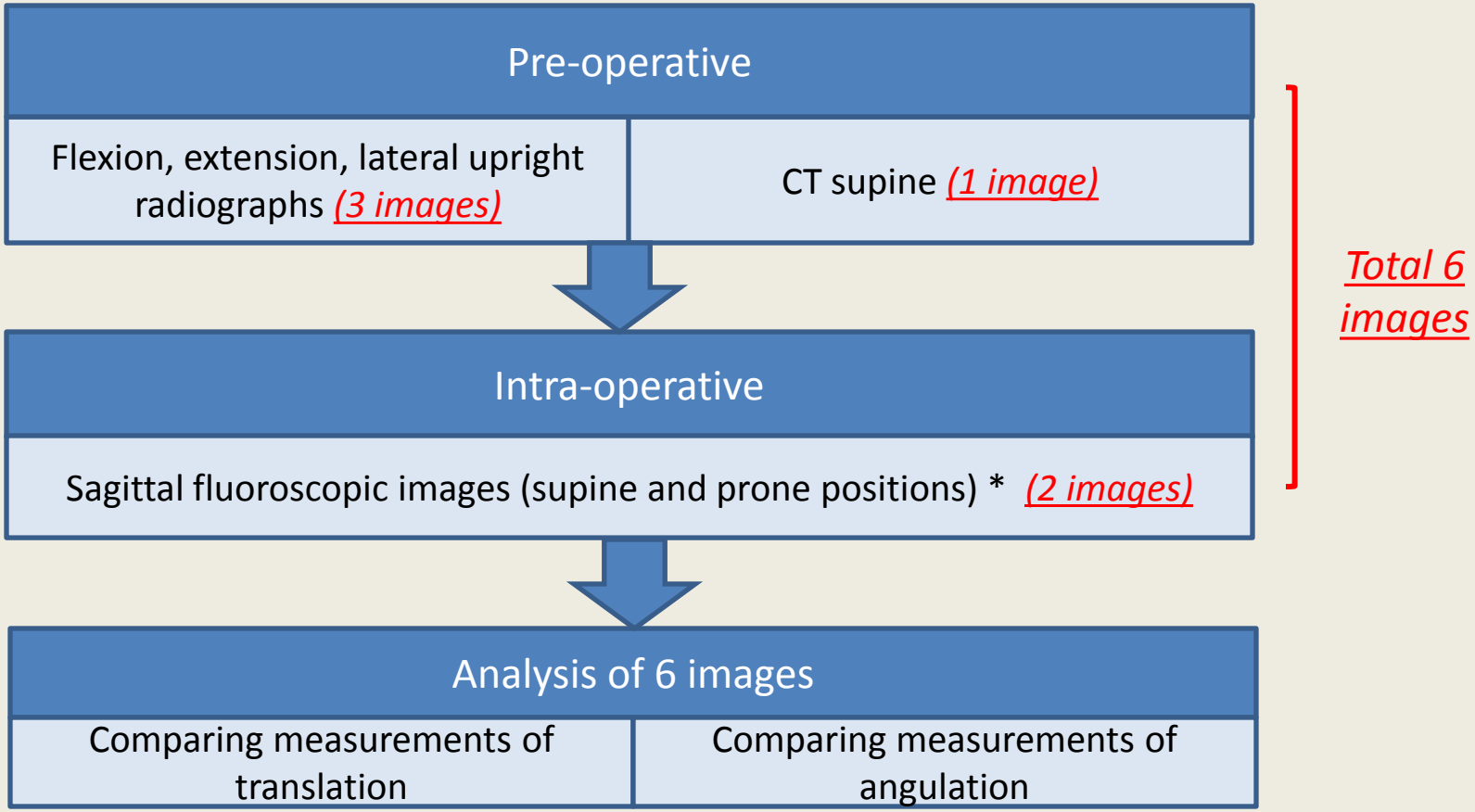
Methods

Pre-operative and post-anesthesia intra-operative images were compared. Instability was defined as ≥ 3.5 mm of translation or ≥ 11° of angulation.



* Sectra IDS7 PACS, Calibrated using PACS with the patient's CT images as references.

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Results (N=100)

Demographics and clinical characteristics	
Mean age	67
Women	57%
BMI, mean	29
Had smoking history	53%
Oswsestry Disability Index score, mean* (range)	48 (6-78)
** 0 = best, 100 = worst*	

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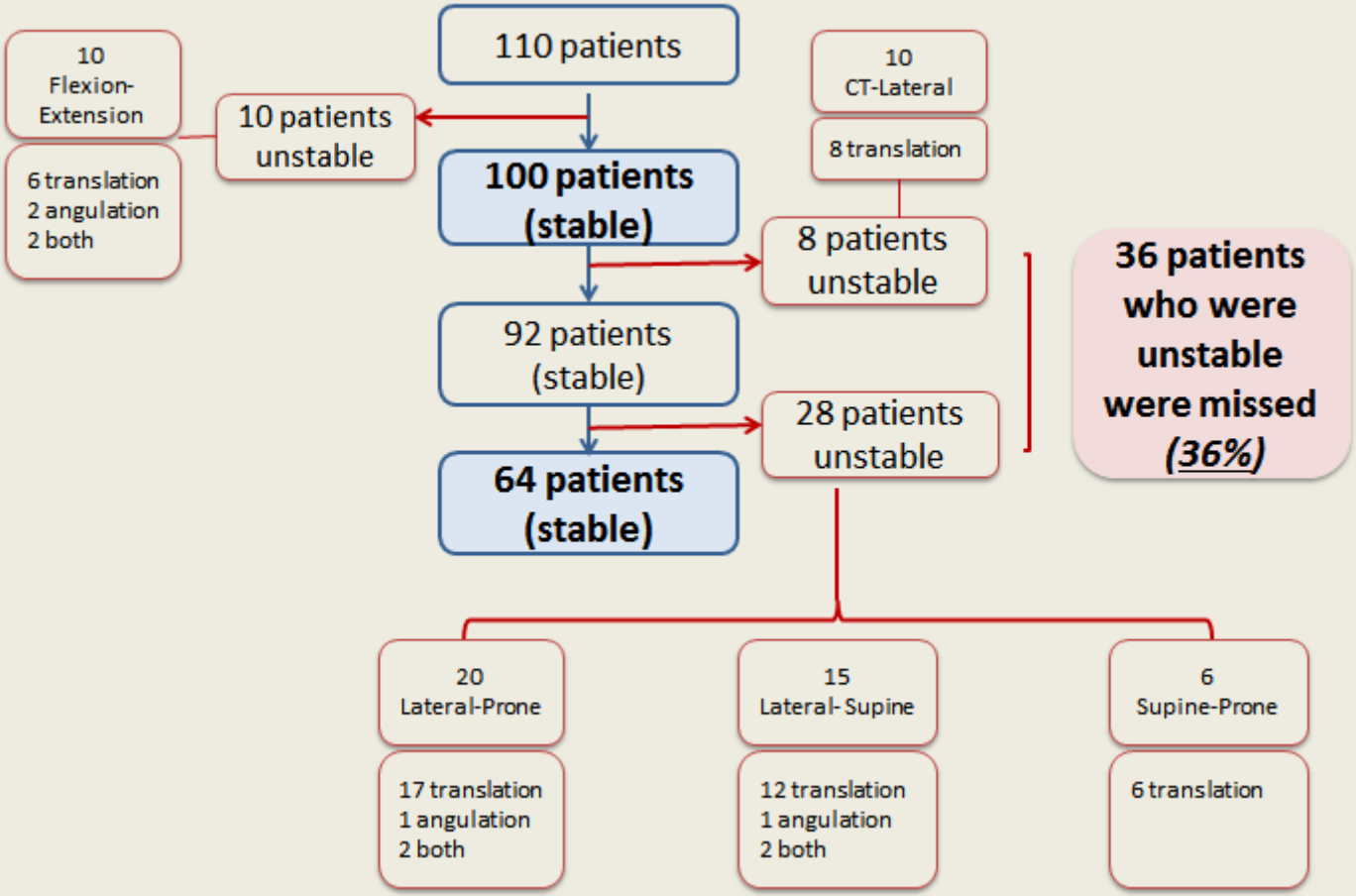
Results (N=100)

Of the 100 patients diagnosed as stable by pre-operative flexion-extension radiographs, 64 remained diagnosed as stable and 36 subsequently were diagnosed as unstable.



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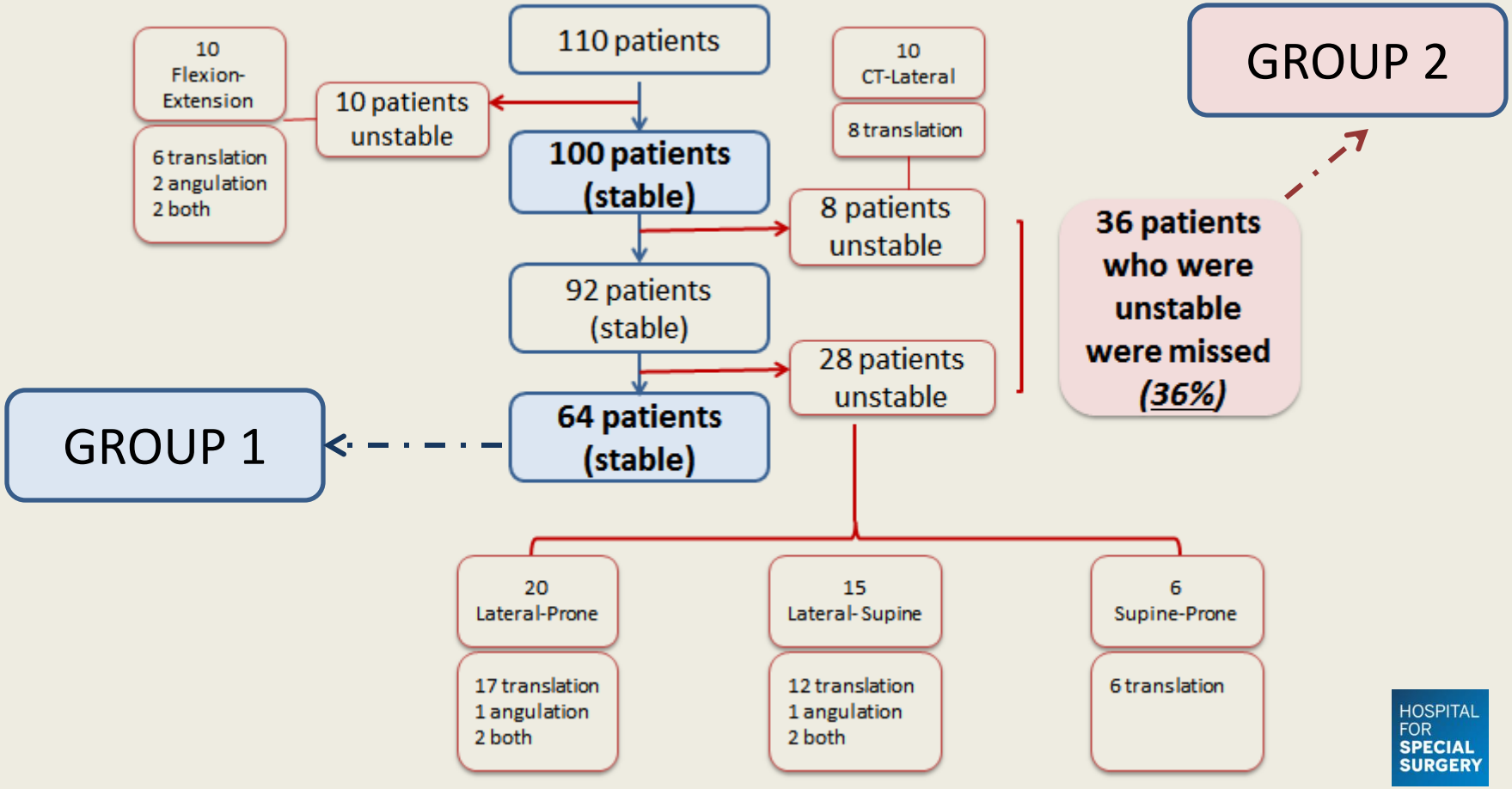

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Results

Reported pain			
	Group 1 Stable (n=64)	Group 2 Unstable (n=36)	p value
Patient self-reported			
back (mean)*	6.4	6.3	.85
leg (mean)*	6.5	6.9	.49
Surgeon-reported (pain present on physical exam)			
flexion	25%	19%	.53
extension	58%	61%	.75
** 0 = best, 100 = worst*			

Summary: There were no differences between groups according patients' self-reported back or leg pain, and no differences between groups according to surgeons' reported pain on flexion or extension.

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Conclusions

Among patients with L4-5 LDS who did not have instability on pre-operative flexion-extension radiographs, patient-reported back and leg pain and surgeon-reported pain on flexion and extension did not predict true instability.

These findings indicate that relying on symptoms and physical exam is not sufficient to predict which patients ultimately will have unstable LDS intra-operatively.

Future work will entail combining several concurrent pre-operative radiographic features to predict true intra-operative instability.

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Disclosure

None of the authors has any potential conflict of interest