

# Biomechanical Comparison of the FacetFuse Transfacet Pedicle Screws versus Pedicle Screws with a Transforaminal or Lateral Interbody Across the Lumbosacral Segment (L5-S1)\*

Kingsley R. Chin, M.D., *Institute for Modern and Innovative Surgery, Fort Lauderdale, FL*  
 L. Perez-Orribo, *Barrow Neurological Institute, Phoenix, AZ*  
 Philip M. Reyes, BSE, *Barrow Neurological Institute, Phoenix, AZ*  
 Anna G.U. Sawa, M.S., *Barrow Neurological Institute, Phoenix, AZ*  
 Steven C. Anagnost, M.D., *The Orthopaedic Center, Tulsa, OK*  
 Vivek P. Kushwaha, M.D., *Houston Orthopedic and Spine Hospital, Houston, TX*  
 Josue P. Gabriel, M.D., *St. Anthony's Memorial Hospital, Effingham, IL*  
 S. Craig Meyer, M.D., *Columbia Orthopaedic Group, Columbia, MO*  
 Carl A.R. Bruce, M.D., *University Hospital of the West Indies, Kingston, Jamaica*  
 Warren D. Yu, M.D., *George Washington University Hospital, Washington DC*  
 Neil R. Crawford, Ph.D., *Barrow Neurological Institute, Phoenix, AZ*

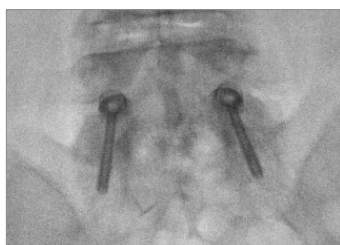


**Research Performed At:**  
 Barrow Neurological Institute, Spinal Biomechanics, Phoenix, AZ 85013

**Principal Investigator:**  
 Neil R. Crawford, Ph.D.



**Co-Investigator:**  
 Kingsley R. Chin, M.D.  
 Institute for Modern and Innovative Surgery,  
 Fort Lauderdale, FL 33311



## Background Context

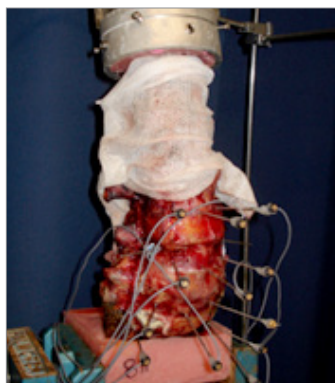
Fixation across the L5-S1 segment is a challenge given the large stresses. No previous research exists regarding biomechanical stability across the lumbosacral segment offered by transfacet pedicular screw fixation (FF) to that of lumbar pedicle screw-rod fixation (PS) in the setting of intact disc as well as after placing a transforaminal (T-LIFT) or lateral (S-LIFT) interbody.

## Purpose

The goal of this *in vitro* study was to quantify the stabilizing potential at L5-S1 of FF versus PS with intact disc, after T-LIFT, and after S-LIFT (trans-psoas approach with interbody wedge graft).

## Study Design/Setting

Non-paired comparison of motion in cadaveric specimens instrumented with FF or PS.



## Patient Sample

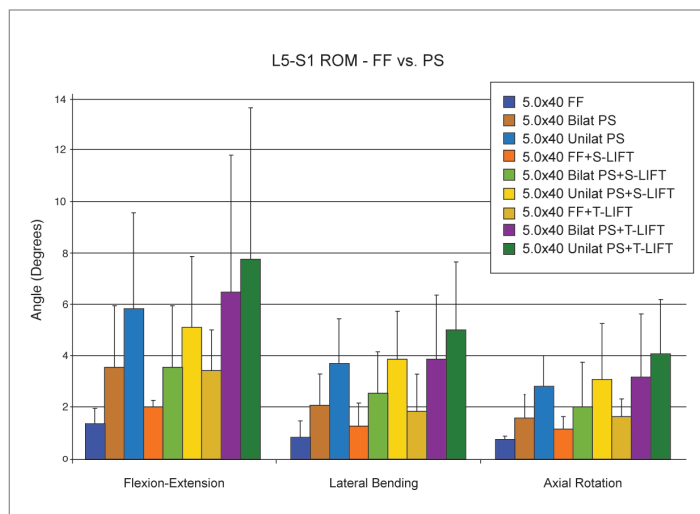
Nine human cadaveric L2-S1 specimens were studied, with procedure performed at L5-S1.

## Outcome Measures

L5-S1 range of motion (ROM) was assessed during flexion, extension, axial rotation, and lateral bending.

## Methods

Specimen flexibility was tested by applying nonconstraining nondestructive pure moments (7.5 Nm maximum) while recording specimen motion optoelectronically in 3D. Specimens were tested (A) intact, (B) after unilateral and bilateral PS at L5-S1 (Group 1) or FF at L5-S1, (C) after T-LIFT (PS or FF still in place), (D) after S-LIFT (PS or FF still in place).



## Results

FF allowed less ROM than either uni- or bilateral PS during all loading modes. With intact disc, unilateral pedicle screws allowed 76% more ROM and bilateral PS allowed 58% more ROM than FF; after S-LIFT, unilateral pedicle screws allowed 63% ROM and bilateral PS 45% ROM compared to FF; after T-LIFT, unilateral pedicle screws allowed 60% ROM and bilateral PS 50% ROM compared to FF. In both FF and PS, flexion-extension was the plane of motion in which greatest ROM was allowed.

## Discussion & Conclusion

At the loads studied, unilateral pedicle screws allowed 76% and bilateral pedicle screws 58% more range of motion than FF immediately postoperative with intact discs, and on average with an interbody it drops to 61.5% and 47.5%, respectively. Therefore, FF provides a much more stable construct than either unilateral or bilateral pedicle screws.

## References

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\*Pending Publication