

Stability and Load Sharing Characteristics of a Posterior Dynamic Stabilization Device

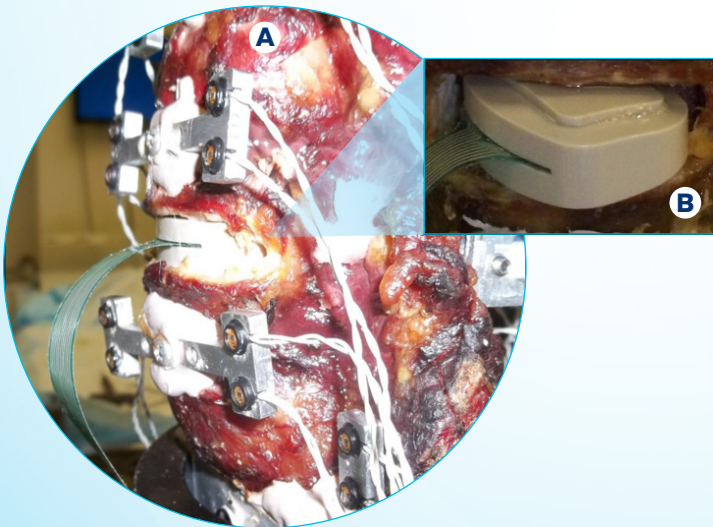
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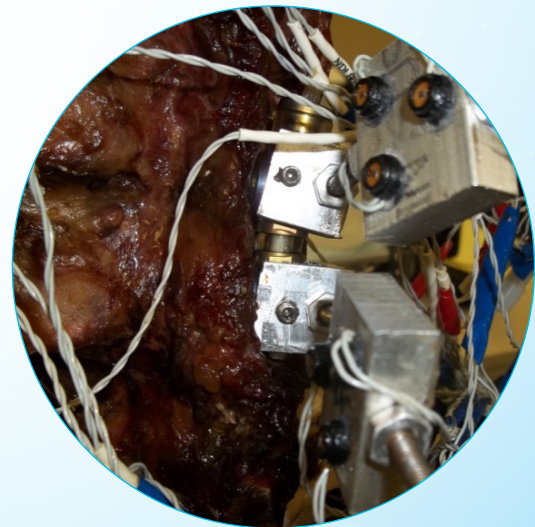
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OBJECTIVE: The aim of this study was to evaluate the mechanical stability and anterior column loading sharing characteristics of a posterior dynamic stabilization system (TRANSITION[®]) compared to titanium rods in an anterior lumbar interbody fusion (ALIF) model.

METHOD: Range of motion, and interbody graft loading were measured in human cadaveric lumbar segments tested under a pure moment flexibility testing protocol.

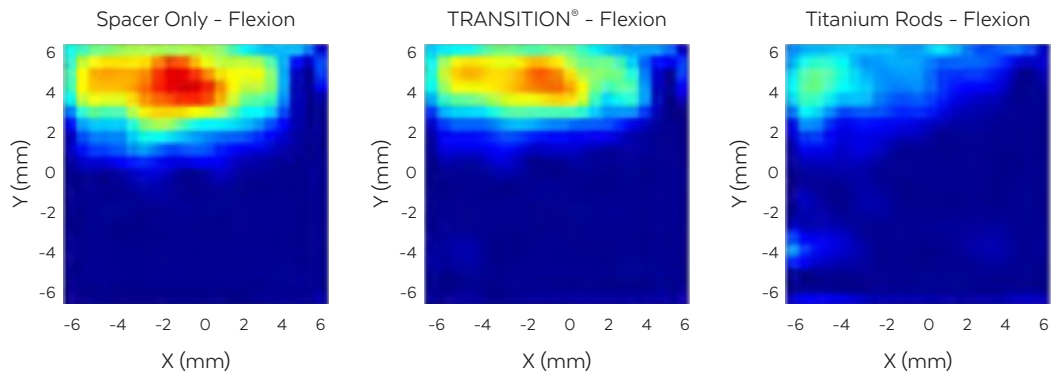


- Ⓐ ALIF spacer with Tekscan pressure sensor inserted into lumbar segment.
- Ⓑ ALIF spacer with Tekscan pressure sensor partially removed from interbody space to illustrate design



Tracking fixtures affixed to pedicle screws during testing of posterior dynamic stabilization system

Sample Pressure Distribution at Peak Flexion



Blue to red indicates transition from low to high pressure area.
The y-axis is oriented anteriorly and the x-axis is oriented to the right.

RESULTS:

- Posterior dynamic stabilization and titanium rods both provided significant fixation compared to the intact condition and compared to an interbody spacer alone in flexion-extension and lateral bending.
- No significant differences in fixation were detected between the posterior devices.
- A significant decrease in graft loading was detected in flexion for the titanium rod treatment compared to the spacer alone.
- No significant differences in graft loading were detected between the spacer alone and posterior dynamic stabilization system.

CONCLUSION:

In this study, no significant differences in graft loading were detected between the spacer and the TRANSITION® implants, while a significant decrease in graft loading was detected in flexion for the titanium rod compared to the spacer.



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