

Impact of Spinal Fusion on Dislocation Risk and Cup Orientation in Anterior Total Hip Arthroplasty

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INTRODUCTION:

Instrumented lumbar spinal fusion (ILSF) is a risk factor for instability following direct anterior approach (DAA) total hip arthroplasty (THA). It's postulated that poor spine-pelvic mobility leads to early impingement and dislocation, but it remains unclear whether ILSF can also affect acetabular component positioning.

METHODS:

Patients with prior ILSF who underwent direct anterior THA at our institution over an 11-year period were identified using Current Procedural Terminology (CPT) codes and matched 1:1 based on age, sex, body mass index (BMI), and American Society of Anesthesiologists (ASA) score to a control cohort without prior ILSF. Each cohort was comprised of 154 THAs. Standing pelvis radiographs were used to estimate functional pelvic tilt (PT) and acetabular component anteversion and inclination. The primary outcome was dislocation rate at final follow-up (mean 38.9 months, minimum 6 months).

RESULTS:

There were 5 dislocations (3.2%) in the ILSF cohort and 0 (0.0%) dislocations in the control group ($P = 0.061$). Estimated functional PT was significantly more posterior on average (-7.77 vs -5.55, $P < 0.01$) and more variable (SD 7.36 vs 5.51) among patients with prior ILSF. Acetabular component anteversion was also significantly greater on average (20.15 vs 18.20, $P < 0.01$) and more variable (SD 7.03 vs 4.85) in the ILSF cohort. The relative frequency of acetabular component anteversion $> 30^\circ$ was significantly higher in patients with prior ILSF (8.4% vs 0.0%, $P = 0.003$). Patients with prior ILSF were also less likely to receive spinal anesthesia (75.3% vs 92.9%, $P < 0.01$).

DISCUSSION AND CONCLUSION:

Patients with prior ILSF undergoing direct anterior THA demonstrated greater variability in functional PT and acetabular component anteversion, including a significantly higher frequency of excessive anteversion.