

Are Spinopelvic Characteristics Associated with Per-Trochanteric Pathology?

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INTRODUCTION:

A strong association between lumbar spine pathology and per-trochanteric pathology exists. However, how the hip-spine relationship may predispose to per-trochanteric pathology has not been established. This study aimed to (1) assess differences in spinopelvic characteristics between patients with and without per-trochanteric pathology, (2) assess which parameters contribute to the pathomechanics.

METHODS:

This is a retrospective, consecutive case-series from an academic center. All patients (n=538) presenting to a hip clinic underwent spinopelvic radiographic assessment in the standing and deep-seated positions. Of those, 256 had Hip- or Pelvic MRI and formed the study cohort (age: 40 ± 13 years-old; 61% females). Spinopelvic parameters included standing lumbar lordosis (LL), pelvic tilt (PT), pelvic incidence (PI), spine flexion (Δ LL) and hip flexion (Δ Pelvic-Femoral-Angle). Adverse spinopelvic characteristics included stiff spine (Δ LL $<20^\circ$), spino-pelvic imbalance (PI-LL $>10^\circ$), increased PT ($>20^\circ$). Presence of per-trochanteric (gluteus medius or minimus) pathology was assessed on MRI by fellowship-trained MSK radiologists based on the presence of tendon tears, tendinopathy, fatty infiltration (Goutaillier classification) and trochanteric bursitis.

RESULTS:

Per-trochanteric pathology was evident in 61% of hips, most common finding being trochanteric tendinopathy (37%). Patients with per-trochanteric pathology had less LL_{standing} ($58\pm 11^\circ$ vs. $62\pm 11^\circ$; p=0.010), greater PT_{standing} ($15\pm 8^\circ$ vs. $12\pm 6^\circ$; p=0.003), lesser Δ LL ($52\pm 14^\circ$ vs. $57\pm 12^\circ$; p=0.005), but no difference in PI ($54\pm 10^\circ$ vs. $53\pm 9^\circ$; p=0.3), or hip flexion (Δ PFA: $99\pm 16^\circ$ vs. $98\pm 17^\circ$; p=0.6). Increased PT_{standing} was more prevalent among patients with per-trochanteric pathology (6% vs. 22%; p<0.001). The only adverse spinopelvic characteristic associated with higher risk of per-trochanteric pathology was high PT_{standing} (OR:3.5, 95%CI 1.5-8.3; p<0.001). Spinopelvic imbalance and lumbar stiffness were not associated with higher risk of per-trochanteric pathology.

DISCUSSION AND CONCLUSION:

Patients with high PT are at-risk of per-trochanteric syndrome and abductor pathology. Increased PT increases working length of abductor tendons, contributing to malfunction and degeneration, which may predispose to inferior outcome following Total Hip Arthroplasty.