# Prevalence and Impact of Hip and Knee Arthritis on Adult Spinal Deformity Outcomes

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INTRODUCTION: Patients with adult spinal deformity (ASD) often present with complex clinical picture and overlapping symptoms of hip-spine, knee-spine, or hip-knee-spine pathologies. Limited data exists on the prevalence of lower extremity osteoarthritis (OA) in ASD, and the impact on baseline and postoperative alignment/PROMS.

METHODS: A total of 520 ASD patients with full body radiographs were included for prevalence analysis. For outcomes analysis patients included had 1) L1-Pelvis or longer fusions and 2) baseline (BL) and 1-year follow up (1yr) radiographs and PROMs. In total, 133 outcome patients were graded with Kellgren Lawrence (KL) classification for Hip and Knee Osteoarthritis by two independent reviewers. Outcome analysis patients were grouped into Hip-Spine: KL grade 3 (G3KL) in both hips or worse (3:4/4:4), or Spine: G2KL or less. Radiographic parameters and PROMs global and individual questions were compared across groups.

RESULTS:

In prevalence analysis, 34% and 32% had at least G3KL in both hips and both knees, respectively. In addition, 8.7% and 13.3% had unilateral or bilateral THA and TKA, respectively.

A total of 133 patients were included for outcome analysis: 68 in Hip-Spine group and 65 in Spine group. Hip-Spine patients were older and had higher Edmonton Frailty score (67.9 vs. 59.6yo, 4.2 vs. 2.9, $p<0.05$). At BL, patients had similar PT (26.2 vs. 25.9), PI-LL (21.9 vs. 19.3), and L4-S1 (29.5 vs. 33.8), but greater SVA (90.4 vs. 65.1 mm, $p =0.014$). At 1yr, both groups had similar PI-LL correction (4.1 vs. 3.7) and BL TK, L4, L1, T9 and T1PA (18.1 vs. 19.4); however, Hip-Spine group had worse SVA (45.9 vs. 19mm, $p= 0.001$). For the same sagittal spinal deformity, Hip-Spine pts had worse ODI (48.1 vs. 37.4), PROMIS (32.6 vs. 35.7), VR12-PCS (25.6 vs. 31.3) at BL and continued to have a worse VR12-PCS (34.5 vs. 40.2) and ODI at 1yr (30.2 vs. 23.4). PROMs questions that remained different at 1yr for Hip-Spine patients were: ODI Walking (1.84 vs. 1.08), ODI Traveling (1.4 vs. 0.9), VR12 Climbing Stairs (1.7 vs. 2.2), SRS 22 Q5, 9 and 16, all $p<0.05$.

DISCUSSION AND CONCLUSION: A third of ASD patients have severe hip or knee OA. Patients with severe hip OA had worse GSA and PROMs at baseline. Following ASD correction, severe hip OA pts continued to have worse global alignment despite correction of lordosis, and worse PROMs, specifically ODI walking, traveling, and VR12 climbing stairs.

| | **Hip Spine** | | **Spine** | |
|---|---|---|---|---|
| | Baseline | 1 Year Follow Up | Baseline | 1 Year Follow Up |
| PTº | 25.9 | 21.7 | 26.2 | 23.4 |
| *PI-LLº* | 21.9 | 3.7 | 19.3 | 4.1 |
| ***SVA mm*** | **90.4*** | **45.9**** | **65.1*** | **19**** |
| *T1PAº* | 28.1 | 19.4 | 25 | 18.1 |
| ***ODI*** | **48.1*** | **30.2**** | **37.4*** | **23.4**** |
| ***VR12 PCS*** | **25.6*** | **34.5**** | **31.3*** | **40.2**** |
| *SRS22* | 2.8 | 3.8 | 2.9 | 3.7 |
| *PROMIS Function* | **32.6*** | 38 | **35.7*** | 40.1 |

*And ** Denotes statistical significance between the two marked values*

*Unbolded values were comparable p>0.05*