Is it Necessary to Obtain Lateral Pelvic Radiographs in Sit-to-Stand for Preoperative Total Hip Arthroplasty Planning?

Aidin Eslam Pour[1], Thomas Christensen, Jordan Howard Green[2], Nishanth Muthusamy, Simon Lalehzarian, Ran Schwarzkopf[3]

[1]Yale school of Medicine, [2]University of Michigan, [3]NYU Langone Orthopedic Hospital, Hospital For Joi

INTRODUCTION:

Many of the current total hip arthroplasty (THA) planning tools only consider sagittal pelvic tilt in standing and sitting positions to determine the best alignment for THA implants to prevent postoperative instability. Considering that postoperative instability generally occurs in sit-to-stand motion, sagittal pelvic tilt in sit-to-stand position is more relevant for preoperative planning. We hypothesize that there is a significant difference in sagittal pelvic tilt between the sitting and sit-to-stand positions as measured by sacral slope in pre- and postoperative full-body radiographs.

METHODS:

This was a multicenter retrospective analysis of pre- and postoperative dual angle full body radiographs of 101 primary THA patients in standing, sitting, and sit-to-stand positions. All patients underwent the same positioning protocol for pre- and postoperative imaging. Sagittal pelvic tilt was measured by sacral slope. The results were compared using paired t-test.

RESULTS:

The mean difference between preoperative sacral slope in a sitting position, and sacral slope in a sit-to-stand position was 3.7° (-62.3° to 62.3°)(p=0.15). The mean difference between postoperative sacral slope in a sitting position and sacral slope in a sit-to-stand position was 11.9° (-61.5° to 79.6°)(p<0.0001).

DISCUSSION AND CONCLUSION: There is a significant difference in sagittal pelvic tilt between sitting and sit-to-stand movements, especially during the postoperative imaging. This difference in our study was as high as 62°. Sit-to-stand view provides valuable information which might be more relevant for preoperative THA planning for prevention of postoperative THA instability.