

Intraoperative Recreation of Preoperative Pelvic Tilt: A Reliable Surgical Technique of Acetabular Component Positioning in Direct Anterior Total Hip Arthroplasty

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ABSTRACT INTRODUCTION: Pelvic tilt (PT) influences acetabular inclination and anteversion, and therefore affects acetabular component positioning when performing Total Hip Arthroplasty (THA). PT for a single patient can vary based on patient positioning; thus, component placement in the supine position during Direct Anterior Approach (DAA) for THA may not reflect desired component placement in the standing position. Therefore, our aim is to assess the efficacy of a novel surgical technique to place acetabular components during DAA THA consistent with standing functional position.

METHODS: Our technique entails manual adjustment of the intraoperative fluoroscopic view to recreate the pelvic position in preoperative standing films. We collected preoperative, intraoperative, and postoperative imaging from 63 consecutive DAA THA procedures using this novel surgical technique. Descriptive and linear regression statistics were calculated. IRB approval was obtained, and all institutional ethical practices were followed.

RESULTS SECTION: Standing PT on anteroposterior (AP) radiographs was not significantly different between preoperative and 3-month postoperative time points (mean difference -0.05° ; $p = 0.48$). Intraoperative PT differed from preoperative and postoperative PT by 3° and -3° , respectively ($p < 0.01$). There was a significant difference between intraoperative and postoperative acetabular component inclination, median difference 3.5° ($p < 0.01$), but no significance difference in acetabular component anteversion from the intraoperative to postoperative, median difference 1° ($p = 0.07$).

DISCUSSION: Accurate and reproducible acetabular component placement is an integral part of THA. Our study demonstrated that standing AP PT was not significantly different between preoperative and early postoperative AP radiographs. Our novel surgical technique to “recreate” preoperative PT during DAA THA led to minimal changes in acetabular component position when comparing intraoperative and postoperative radiographs. Therefore, this surgical technique in DAA THA, even without technological assistance, is a reliable method for functional placement of acetabular components. **Limitations:** This study is limited by its small sample size and absence of a control group. Our future directions will look to evaluate long-term outcomes in patients undergoing DAA THA using this method, ideally with a comparative control cohort.

SIGNIFICANCE/CLINICAL RELEVANCE: Accurate acetabular component positioning is critical for successful THA. This surgical technique allows intraoperative recreation of preoperative standing pelvic tilt, potentially improving functional implant alignment. Intraoperative to postoperative changes in acetabular component inclination and anteversion average $< 4^\circ$ with this technique.

REFERENCES: N/A

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IMAGES AND TABLES:

