Paper #53

Accuracy of Fluoroscopic Guided Acetabular Component Positioning during Direct Anterior Total Hip Arthroplasty

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Introduction: Acetabular component malposition contributes to increased dislocation risk, impingement, accelerated wear, and early revision. Supine positioning during direct anterior (DA) total hip arthroplasty (THA) facilitates the use of intraoperative fluoroscopy, which may improve component position accuracy. The purpose of this study was to evaluate the accuracy of acetabular component orientation using intraoperative fluoroscopy in DA THA.

Methods: We retrospectively analyzed the acetabular component position in a consecutive series of 780 fluoroscopic guided DA THA performed by two surgeons in yearly intervals over a 3-year period, including their initial experiences. Component position was measured postoperatively using specialized software following the method described by Barrack, et. al. Target ranges for abduction and version angles were defined (30o to 50o and 5o to 25o, respectively) according to the "safe zone" established by Lewinnek et. al.

Results: Over the study period, 718 (92%) fell within the targeted abduction range (mean 37.6o; range 18.7o to 54.5o; std dev 5.46) , 723 (93%) fell within the targeted anteversion range (mean 18.7o, range 4o to 34.7o; std dev 5.30) , and 698 (88%) met both criteria. The accuracy of component positioning for combined inclination and anteversion improved yearly (79.2% in 2011, 90.9% in 2012, and 95.6% in 2013). Standard deviation for inclination and anteversion decreased for both surgeons yearly (Surgeon A: 2010, 6.65 and 7.59; 2011, 5.41 and 7.38; 2012, 5.39 and 4.25; 2013, 4.28 and 4.24, respectively) (Surgeon B: 2011, 8.09 and 6.20; 2012, 5.86 and 5.84; 2013, 4.02 and 4.02, respectively).

Conclusion: Fluoroscopy in DA THA is an accurate method to improve acetabular component orientation. There is a learning curve associated with the interpretation of intraoperative fluoroscopy. Compared to other available tools, fluoroscopy is readily available and cost-effective.