

Conventional Fluoroscopy versus Image guided Hip Navigation in Direct Anterior Total Hip Arthroplasty

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INTRODUCTION:

The purpose of this study was to compare the accuracy of component positioning in direct anterior approach total hip replacements (DAA THA) using conventional fluoroscopy with those completed using fluoroscopic image dependent navigation.

METHODS:

Fifty patients who had a DAA THA completed with conventional fluoroscopy were compared with 50 patients who had a DAA THA completed with fluoroscopic image dependent navigation. All total hip replacements were performed by two fellowship trained high-volume surgeons. The primary outcomes for the study included: absolute deviation from intraoperative and post operative anteversion/inclination, absolute mean deviation from surgeon's target zone, and number of cups within the surgeons preferred target zone. Secondary outcomes included operative time and 60-day complications (dislocation, infections, periprosthetic fracture).

RESULTS:

There was no difference in average anteversion and inclination from the surgeon's target safe zone. In final cup position anteversion, the fluoroscopy group demonstrated an average of 5.37 degrees deviation (4.64; 0.1 – 20.55) versus navigation group with an average of 5.26 (3.7; 0.1 – 14.5) $P=0.9$. With respect to final cup inclination, the fluoroscopy group had an average deviation of 3.9 (3.18; 0.4 – 12.2) versus 3.45 (2.67; 0 – 9.1) in the navigation group ($P=0.454$). With use of conventional fluoroscopy only, Surgeon A had 59% of cups placed in target zone while Surgeon B had 43% cups placed on target. In comparison, with use of the image guided navigation, Surgeon A achieved 83% of cups placed within target zone while Surgeon B achieved 69%. There was no difference regarding operative time between the use of fluoroscopy only and image guided navigation ($P=0.117$).

DISCUSSION AND CONCLUSION:

In comparison to the fluoroscopy only technique, the image guided navigation system demonstrated increased accuracy in cup inclination and overall placement of acetabular component within the surgeon's target zone in the direct anterior approach.