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Does Surgical Approach in Total Hip Arthroplasty Influence Socket Position and Limb Length Discrepancy? A Comparison of the Anterior, Lateral, and Posterior Approaches

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Introduction: It is unknown if surgical approach influences socket position and limb length discrepancy. Optimization of these variables will improve outcomes and enhance survivorship. We hypothesized that the anterior approach with fluoroscopy would enable more accurate socket positioning and equalization of limb lengths.

Methods: Radiographs of 977 patients with osteoarthritis enrolled in an international, multicenter, prospective, cohort study were analyzed. Ninety-nine patients were added to the anterior approach cohort to optimize sample size. The number of patients who received the anterior (I), lateral (II), and posterior (III) approaches were 208, 318, and 550, respectively. Target zones were set at 30-50° abduction and 5-35° anteversion. Data were collected via a web-based registry and analyzed in Excel and Stata.

Results: Proportions of sockets in the abduction target zone were 83.2%(I), 72.6%(II), and 79.8%(III) ($p=0.008$). Proportions of sockets in the anteversion target zone were 98.1%(I), 68.0%(II), and 85.4%(III) ($p < 0.001$). Proportions of sockets in both target zones were 82.1%(I), 57.3%(II), and 73.0%(III) ($p < 0.001$). Compared to group I, group II (OR 3.4, CI 2.2-5.2) and group III (OR 1.7, CI 1.1-2.5) were more likely to fall outside both target zones. Compared to group II, group III had a better chance of being in both target zones (OR 2.01, CI 1.5-2.7). Mean limb length discrepancies were 4.6 ± 3.7 mm(I), 4.6 ± 3.9 mm(II), and 4.6 ± 4.0 mm(III), respectively ($p=0.62$, with numbers available). The proportions of patients whose limb length discrepancy exceeded 10mm were 8.9 ± 2.1 %(I), 9.7 ± 1.7 %(II), and 9.7 ± 1.3 %(III) ($p=0.94$, with numbers available).

Conclusion: Accuracy of socket positioning was better with the anterior approach with fluoroscopy compared to both the lateral and posterior approaches. Socket position was more accurate with the posterior approach compared to the lateral approach. With the numbers available, surgical approach did not influence limb length discrepancy.
