

Summary of: ANTERIOR VS. POSTERIOR APPROACH FOR TOTAL HIP ARTHROPLASY, A SYSTEMATIC REVIEW AND META-ANALYSIS

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Location

USA

Objectives

To compare patient outcomes following a primary total hip arthroplasty (THA) via the anterior versus posterior approach focusing on the clinical, radiographic and surgical outcomes.

Treatments Assessed

- THA using an anterior approach (AA)
- THA using a posterior approach (PA)

Outcomes

- Primary outcomes: validated patient-reported outcome measures: Visual Analog Pain (VAS) Score, Harris Hip Score (HHS), Medical Outcome Study (SF-12 or SF-36), Hip disability and Osteoarthritis Outcome Score (HOOS), Hip Outcome Score (HOS), Western Ontario & McMasters University Arthritis Index (WOMAC), Oxford Hip Score (OHS), UCLA Activity Scale, Japanese Orthopedic Association Hip Score (JOAHS), Merle d'Aubigne and Postel score

Study Design

A systematic review and meta-analysis

Published comparative studies of patients undergoing a primary THA were included in the analysis if one group received single incision, AA THA and another group received PA THA. The study had to report ≥ 1 quantifiable pre-specified outcome measure.

Cochrane Handbook standard methodology was used and findings were reported using the PRISMA* statement guidelines.

Studies were identified using the MeSH terms 'Total Hip Arthroplasty' AND 'Surgical Approach' in Medline, the Cochrane Library, and CINAHL. 998 papers were identified in total, 17 peer-reviewed publications published between 2006 and June 2014 were found to meet all inclusion criteria: two randomized control trials, five prospective comparative studies and ten retrospective comparative studies.

Results

Primary outcomes

9 of 17 studies included patient reported pain and functional outcomes with varied follow-up intervals. In 4 of 9 studies, AA was found to be significantly favored:

- 2 week VAS scores (2.2 vs. 5.2, $P < 0.001$)¹
- 6-week HHS subsets and 6-week total HHS (89.5 vs. 81.4, $P = 0.0001$) and 3-month HOOS symptoms scores (90.0 vs. 83.9, $P = 0.0471$)²
- 2-month Merle d'Aubigne and Postel ability to walk scores (5.0 vs. 4.3, $P = 0.023$)³
- WOMAC stiffness score (0.0 vs. 12.5, $P < 0.05$)⁴

No significant differences were found between the two groups in the remaining five studies.

Secondary outcomes

There was a significant difference favoring AA for post-operative length of stay, WMD*: -0.53 days (95% CI -1.01 to -0.04 days, $P = 0.03$) and for number of post-operative dislocations, Peto OR*: 0.29 (95% CI 0.09 to 0.95, $P = 0.04$).

No significant differences were found between the two groups for:

- Estimate blood loss, WMD*: 76mL (95% CI -38 to 190mL)
- Rate of intra-operative fracture, Peto OR: 1.14 (95% CI 0.44 to 2.96)

- Operative time, WMD: 7.9 mins (95% CI -1.8 to 17.7 mins)
- Rate of patients discharged to home vs. a rehabilitation facility, RR: 1.10 (95% CI 0.97 to 1.23)
- Percentage of acetabular cups placed within the Lewinnek safe zone, RR: 1.11 (95% CI 0.99 to 1.24)

In one study⁵, the PA group had 5.5 times greater immediate increase in creatine kinase levels in the post-anesthesia care unit which was significant, mean difference: 150.3 U/L (95% CI 70.4 to 230.2, $P < 0.05$).

When comparing post-operative narcotic consumption: AA was favored significantly for post-operative day 0-3⁶. A second study showed AA patients had a significantly lower VAS pain score for post-operative day 1 but no difference on the day of surgery or on post-operative day 2⁷. A third study showed no significant differences⁷.

No studies reporting spatiotemporal gait analysis found significant differences between approaches.

Authors Conclusions

- AA was associated with potential benefits in early patient reported pain and function outcomes, post-operative length of stay, dislocations and post-operative narcotic consumption.
- The pooled results of the analysis favor AA in terms of the percentage of patients discharged to home and the percentage of acetabular cups placed within the Lewinnek safe zone, however, no statistical significance was demonstrated.
- PA was associated with decreased operative time and estimated blood loss, but neither difference was statistically significant.
- There is a need for methodologically rigorous, multi-center, prospective, randomized controlled trials with predefined reporting, standardized follow-up intervals, outcome measures, anesthesia and rehabilitation protocols and reporting of pre-operative indication. These findings and limitations are consistent with a similar systematic review performed by Jolles et al⁸⁻¹⁰ comparing the posterior and lateral approach to THA, due to which no superiority conclusion for either approach could be made.

Link to full article

1 Zawadsky MW, et al. J Arthroplasty 2014;29(6):1256. 2 Barrett WP, et al. J Arthroplasty 2013;28(9):1634. 3 Nakata K, et al. J Arthroplasty 2009; 24(5):698. 4 Maffiuletti NA, et al. Orthop Clin North Am 2009;40(3):407. 5 Bergin PF, et al. J Bone Joint Surg Am 2011;93(15):1392. 6 Schweppe ML, et al. Surg Technol Int 2013;XXIII. 7 Rodriguez JA, et al. Clin Orthop Relat Res 2014;472(2):455. 8 Jolles BM, Bogoch ER. Cochrane Database Syst Rev 2004(1): CD003828. 9 Jolles BM, Bogoch ER. J Rheumatol 2004; 31(9):1790. 10 Jolles BM, Bogoch ER. Cochrane Database Syst Rev 2006(3): CD003828.

*PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; WMD: weighted mean difference; Peto OR: Peto Odds Ratio (used in meta-analysis to combine odds ratios)

This summary is based on *Anterior vs. Posterior Approach for Total Hip Arthroplasty, a Systematic Review and Meta-analysis* and produced by DePuy Synthes for promotional purposes.

