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Mechanical Complications Following Total Hip Arthroplasty Based on Surgical Approach: A Large Single Institution Cohort Study

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Introduction: With a renewed interest in surgical approach, our aim was to perform the first single institution study on the risk for early operative and non-operative mechanical complications after THA based on approach.

Methods: A retrospective observational study was conducted on 16,186 consecutive primary THA cases performed by 17 surgeons from 2010-2016. Revision or conversion THA and cases performed for hip fracture, with a recalled prosthesis, or during a surgeon's learning period were excluded. THAs were performed using a direct anterior (DA; n=5,465), direct lateral (DL; n=8,561), or posterolateral approach with soft tissue repair (PL; n=2,160). All mechanical complications, including instability/dislocation, periprosthetic fracture, loosening, and prosthesis failure, within the first two years were identified with an extensive manual review of institutional records. The primary analysis was performed with time to event Cox regression, accounting for patient and surgeon characteristics.

Results: Compared with the DL approach, the risk for mechanical complications was higher for both the DA (hazard ratio [HR] 2.4) and PL (HR 2.0) approaches. Instability accounted for the greatest risk increase, especially for PL patients (HR 10.0), with adjusted 2-year incidences of 0.17%, 0.74%, and 1.74%, respectively, for the DL, DA, and PL approaches. While occurring at similar rates for the PL and DL approaches, the risk for periprosthetic fracture and loosening were increased for the DA approach (HR 2.3 and 1.7, respectively). Thus, femoral failure, including fracture or loosening requiring reoperation, occurred more frequently for DA patients, with an adjusted incidence of 1.20% compared with 0.58% and 0.47%, respectively, for the DL and PL approaches.

Conclusion: Even with soft tissue repair, instability continues to plague the PL approach. While reducing dislocation, a higher risk of femoral failure with DA THA must also be considered. Nevertheless, the DL approach appears to confer the lowest overall risk for mechanical complications.