Systematic Review

A Comparison of Supine and Lateral Decubitus Positions for Hip Arthroscopy: A Systematic Review of Outcomes and Complications

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Purpose: This systematic review examines outcomes and risk profiles of the hip arthroscopy in the supine versus lateral decubitus positions to elucidate any superiority of one approach over the other. **Methods:** Three databases (Embase, PubMed, and Medline) were searched for studies that addressed hip arthroscopy performed in either position, and were subsequently screened by two reviewers with data abstracted in duplicate. **Results:** Similar outcomes were observed. Supine studies showed a greater mean postoperative improvement for modified Harris hip score (33.74), visual analog scale (−3.99), nonarthritic hip score (29.61), Harris hip score (35.73), and hip outcome score (31.4). Lateral decubitus studies showed greater improvement using the Western Ontario and McMaster University Osteoarthritis (14.76) score. Supine studies reported more neuropraxic injuries (2.06% *v* 0.47%), labral penetration (0.65% *v* 0%), and heterotopic ossification (0.21% *v* 0%). Lateral decubitus studies reported more fluid extravasation (0.21% *v* 0.05%) and missed loose bodies (0.08% *v* 0.01%). Similar rates of revision (1.8% lateral, 1.4% supine) and conversion to open procedures (2.6% in lateral, 2.0% in supine) were also identified. **Conclusions:** Because of quality of evidence, direct comparisons are currently limited; however, the supine position is associated with more neuropraxic injuries, labral penetration, and heterotopic ossification, whereas lateral decubitus has increased risk of fluid extravasation and missed loose bodies. At this time, no evidence exists to establish superiority of one position. **Level of Evidence:** Level IV, systematic review of Level II, III, and IV studies.

Hip arthroscopy, first described by Burman et al. in 1931[1] and with clinical applications beginning in the 1970s and 1980s,[2] continues to be performed at increasing rates.[3] Hip arthroscopy, however, is difficult to perform, as surgeons' portal creation and instrument maneuverability are challenged by the thick soft-tissue envelope, neurovascular structures, and largely recessed nature of the hip joint.[4-6] Nevertheless, the minimally invasive nature of hip arthroscopy, and its expanding diagnostic and therapeutic role for both a wide array of intra- and extra-articular in hip pathology have made it an attractive procedure that treats symptoms, improves recovery, and facilitates timely return to sport/activities.[7-11]

Historically, hip arthroscopy has been performed in the supine position; however, some have also described the lateral decubitus position.[6] The supine position requires a heavily padded perineal post to facilitate traction[12] and typically uses three "standard" portals: (1) anterolateral portal, (2) anterior portal, and (3) posterolateral portal.[7] Advocates for supine hip arthroscopy state its ease for patient setup and ability to be performed on any standard fracture table; user-friendly layout of the operating room; use of reliable, established portals and supplemental portals; and ease of repositioning as major advantages to this approach.[13-15] This is offset by its disadvantages of neuropraxia of the perineal region due to pressure from the perineal post, difficult access in obese patients (particularly posteriorly), and difficult

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intra-articular access in the presence of large anterolateral osteophytes.[13,15,16] On the other hand, hip arthroscopy in the lateral decubitus position requires a foot/traction device, perineal post, and typically uses two portals: one over the greater trochanter and one just anterior.[16] Advocates of this approach state its relative ease in obese patients and in navigating around anterolateral osteophytes; easier facilitation of peritrochanteric approaches; and direct access to the superior, anterior, and posterior femoral neck[5] as major advantages. This is offset by the concern for difficulty in establishing supplemental portals, longer time for patient setup, and risks for accumulation of intra-abdominal fluid with associated compartment syndrome.[14,16]

Whether one patient position is superior to another during hip arthroscopy has never been studied. The importance of patient positioning in arthroscopy cannot be understated however, and has been the topic of much debate in shoulder arthroscopy, with advocates for both the "beach chair" and lateral decubitus positions. Although these positions also have their associated advantages/disadvantages, the literature has not yet established superiority of one over the other.[17,18] In 2015, Gupta et al.[2] published "Best practices during hip arthroscopy: aggregate recommendations of high volume surgeons," a cross-sectional study of 27 high-volume orthopaedic surgeons, and the recommendation was that hip arthroscopy be performed in the supine position, as this was the position that all 27 of their participants preferred. However, "Expert Opinion" is Level V evidence. This systematic review examined outcomes and risk profiles of hip arthroscopy in the supine versus lateral decubitus positions to elucidate any superiority of one approach over the other. We hypothesized that the outcomes and rate of complications would be largely influenced by surgeon skill and previous training, and did not anticipate major differences between the two approaches.

Methods

Search Strategy

Two reviewers (K.S., D.P.) searched three online databases (PubMed, Medline, and Embase) for literature related to hip arthroscopy in both the supine and lateral decubitus positions, respectively. Each database was searched for literature present from database inception to March 25, 2015. The search strategy from each database is included as Figure 1.

Inclusion and Exclusion Criteria

The research questions in conjunction with the inclusion/exclusion criteria were established a priori. Literature that met the following criteria for eligibility was included: (1) original studies; (2) all levels of evidence; (3) studies involving human patients; (4) studies in the English language only; (5) surgical treatment involving hip arthroscopy with outcome data, and (6) studies that specifically indicated whether hip arthroscopy was performed in either the supine or lateral decubitus position. Exclusion criteria included the following: (1) nonoriginal studies including review articles, systematic reviews, book chapters, editorials, abstracts and conference papers, commentaries, and surgical technique papers; (2) nonhuman studies (cadaveric studies, studies on animals, in vitro, simulation, and anatomical studies); (3) studies in non-English language; (4) studies with no outcome data; and (5) studies that do not perform hip arthroscopy as the sole procedure.

Study Screening

Texts of the retrieved literature were independently screened in three stages via titles, abstracts, and full texts by two reviewers (K.S., D.P.). During the screening process of both the titles and abstract stages, if either reviewer believed that an article was warranted to be included into the next stage, it was included to ensure meticulousness. During the full-text stage of screening, any discordance between the two reviewers was thoroughly discussed and resolved via discussion. Subsequently, any unresolved conflicts were mediated by the third senior reviewer (D.d.S.) until a consensus was reached.

Data Abstraction

Two reviewers (K.S., D.P.) collected data in duplicate and recorded them in a Microsoft Excel 2013 spreadsheet (Microsoft, Redmond, WA). Data regarding information including author, year of publication, sample size, study design, level of evidence, patient demographic data (sex, age, affected hip [left *v.* right], etc.), length of follow-up, percentage of patients available to follow-up, and position of the patient during surgery were recorded. The outcome data were pre- and postoperative measurements of patient-reported hip outcome scores, pain, and complications/revisions.

Assessment of Agreement

A weighted κ value and 95% confidence intervals (CIs) were calculated for all three stages of screening. We determined κ values to indicate the level of agreement, with κ greater than 0.61, indicating substantial agreement; κ of 0.41 to 0.61, moderate agreement; and κ less than 0.21, slight agreement.[19]

Statistical Analysis

Descriptive statistics are provided as there were no consistent measures of variance or time points for follow-up outcome scores; thus, in consultation with our study statistician, we were unable to assess any degree of statistical significance.