

Effect of Femoral Anteversion on Clinical Outcomes After Hip Arthroscopy



Timothy J. Jackson, M.D., Dror Lindner, M.D., Youssef F. El-Bitar, M.D.,
and Benjamin G. Domb, M.D.

Purpose: To compare the clinical outcomes after hip arthroscopy of patients with femoral retroversion, normal femoral version, and excessive femoral anteversion. **Methods:** Patients who underwent primary hip arthroscopy from August 2008 to April 2011 and underwent femoral anteversion measurement by magnetic resonance imaging/magnetic resonance arthrogram were included. The patients were divided into 3 groups: retroversion, normal version, and excessive anteversion. The normal-version group was considered to have a value within 1 SD of the mean femoral version value. Four patient-reported outcome scores and the visual analog pain score were prospectively collected with analysis performed retrospectively. **Results:** Two hundred seventy-eight patients met the inclusion criteria. Among these patients, mean anteversion was $8.2^\circ \pm 9.3^\circ$, creating a retroversion group defined as -2° or less and an anteversion group defined as 18° or greater. There were 25 patients in the retroversion group, 219 in the normal-version group, and 34 in the excessive-anteversion group. Most labral tears were noted in the 12- to 2-o'clock range, with the main difference at the anterior 3-o'clock position, where the excessive-anteversion group showed a lower incidence of tearing (30%) than the retroversion group (73%) and normal-anteversion group (78%). Postoperatively, there was a statistically significant improvement from preoperative scores in all 3 groups and for all scores ($P < .001$). When the postoperative scores were compared for the 3 groups, although all scores were higher in the retroversion group than in the other 2 groups, this was not statistically significant and there were no significant differences in scores among the 3 groups (modified Harris Hip Score, $P = .104$; Non-Arthritic Hip Score, $P = .177$; Hip Outcome Score—Activities of Daily Living, $P = .152$; Hip Outcome Score—Sport-Specific Subscale, $P = .276$; visual analog scale score, $P = .508$). **Conclusions:** On the basis of patient-reported outcome scores without accounting for diagnoses and treatments, the amount of femoral anteversion does not appear to affect the clinical outcomes after hip arthroscopy. **Level of Evidence:** Level III, retrospective comparative study.

The evolution of hip arthroscopy as it pertains to various hip pathologic conditions has been rapid with ever-expanding indications. Appropriate patient evaluation is vital to successful outcomes in hip arthroscopy. Although much is known about acetabular retroversion and its relation to pincer-type impingement, less is known about the effect of

femoral version in patients with femoroacetabular impingement (FAI) and instability.

Several studies have examined the association between excess femoral anteversion and retroversion and its role in the development of arthritis.^{1,2} Tönnis and Heinecke² showed the relation between femoral and acetabular anteversion and retroversion and their effect on range of motion, the incidence of hip pain, and osteoarthritis.

Hip arthroscopy has been used to treat many patients with nonarthritic hip pain. The role of cam deformity and pincer deformity in FAI has been widely studied^{3,4}; the role of femoral anteversion as it relates to nonarthritic hip pain and hip arthroscopy has been considered, yet it has not been studied widely.⁵⁻⁷ Moreover, clinical outcome studies comparing patients with various amounts of femoral anteversion are lacking, except for a study relating to iliopsoas release.⁸

The purpose of this study was to compare the clinical outcomes after hip arthroscopy of patients with femoral retroversion, normal femoral version, and excessive

From the American Hip Institute (T.J.J., D.L., Y.F.E.-B., B.G.D.), Chicago, Hinsdale Orthopaedics (B.G.D.), Hinsdale, and Loyola University Stritch School of Medicine (B.G.D.), Chicago, Illinois; and Congress Medical Associates (T.J.J.), Pasadena, California, U.S.A.

The authors report the following potential conflict of interest or source of funding: B.G.D. receives support from Arthrex, MAKO Surgical, American Hip Institute, Breg, ATI, Pacira, Stryker, Orthomerica, DJO Global.

Received September 5, 2013; accepted July 9, 2014.

Address correspondence to Benjamin G. Domb, M.D., Loyola University Chicago, Hinsdale Orthopaedics, American Hip Institute, 1010 Executive Ct, Ste 250, Westmont, IL 60559, U.S.A. E-mail: DrDomb@americanhipinstitute.org

© 2015 by the Arthroscopy Association of North America

0749-8063/13652/\$36.00

<http://dx.doi.org/10.1016/j.arthro.2014.07.009>

femoral anteversion. Our hypothesis was that all patients would have similar clinical outcomes regardless of the degree of femoral anteversion.

Methods

Between the study period of August 2008 and April 2011, patients who underwent primary hip arthroscopy and underwent femoral anteversion measurement by magnetic resonance imaging (MRI)/magnetic resonance arthrogram (MRA) were included. Patients were excluded if they had previous surgery, a Tönnis arthritis grade greater than 1, inflammatory arthropathy, Legg-Calvé-Perthes disease, or MRI/MRA without femoral anteversion measurement. In the practice setting of the senior author (B.G.D.), most patients have undergone MRI before referral. Because not all MRI centers perform sequences from which femoral anteversion can be measured, these values were not available in a large cohort of patients; thus these patients had to be excluded from the study. Institutional review board approval was obtained.

The patients were divided into 3 groups: retroversion, normal version, and excessive anteversion. This division was established by first calculating the mean and standard deviation of the MRI version measurements. Patients were then placed in the retroversion group if their femoral anteversion measurement was beyond 1 SD below the mean. Alternatively, patients were placed in the excessive-anteversion group if their femoral anteversion measurement was beyond 1 SD above the mean. Femoral version was measured with MRI by a board-certified radiologist by referencing off the posterior femoral condyles and a line through the center of the neck in the axial oblique plane.^{9,10} MRI was chosen for anteversion measurements because this is the modality most often used, as opposed to computed tomography (CT) scans, as part of routine preoperative workup.

All data were prospectively collected and retrospectively reviewed, with visual analog scale and patient-reported outcome (PRO) scores obtained preoperatively and postoperatively (3 months, 1 year, 2 years, and 3 years), including the modified Harris Hip Score (mHHS),¹¹ the Non-Arthritic Hip Score,¹² the Hip Outcome Score—Activities of Daily Living,¹³ and the Hip Outcome Score—Sport-Specific Subscale. The visual analog scale score was measured on a scale from 0 to 10, with 0 being no pain and 10 being severe pain. Patient satisfaction was recorded based on a scale from 0 to 10, with 0 being completely unsatisfied and 10 being completely satisfied. Any conversion to total hip arthroplasty (THA) was noted. The senior author evaluated all patients and performed surgery on all patients. A subgroup analysis was performed for each group, comparing the PRO scores of those patients who underwent iliopsoas release and those who did not.

Radiographic imaging included standing and supine anteroposterior pelvis, bilateral Dunn, cross-table

lateral, and false-profile views. MRA was obtained in all patients to diagnose pathology of the labrum, capsule, ligamentum teres, and peritrochanteric space.

Diagnoses were made based on radiographic and intraoperative findings. Pincer FAI was defined as a crossover sign or coxa profunda (lateral center-edge angle $>40^\circ$), and cam FAI was defined as an alpha angle greater than 50° on the Dunn view. Labral tears were confirmed by intraoperative findings. Internal snapping was defined as painful snapping of the hip or by iliopsoas impingement signs intraoperatively.¹⁴ Intraoperative data obtained included the location of labral tears (clock face) and procedures performed on the labrum, capsule, and iliopsoas. The clock-face method of measuring labral tearing uses the 12-o'clock position as the most superolateral portion of the acetabulum and the 6-o'clock position as the transverse ligament. The 3-o'clock position is the anterior-most portion of the acetabulum on a right hip, and left hip measurements are adjusted to the right such that the 3-o'clock position is anterior for a left hip.⁶ As a general treatment algorithm, pincer impingement was treated with acetabuloplasty and cam impingement was treated with femoroplasty.¹⁵ Labral repair was performed when there was labral tearing and sufficient labral tissue for repair. Iliopsoas release was performed in patients with symptomatic internal snapping or a positive iliopsoas impingement sign on the labrum at the 3- to 4-o'clock position.¹⁴ The capsule was repaired routinely except in patients in whom a release was considered to be therapeutic, such as patients with stiff hips or thickened capsules.

Statistical Analysis

Descriptive statistics were used for patient demographic data and procedures. A paired Student *t* test was used to compare preoperative with postoperative PROs. The χ^2 test was used to compare preoperative diagnoses, gender, side, and procedures. Patient demographic data and postoperative PROs were compared with a 1-way analysis of variance with Tukey post hoc analysis to measure significance among the 3 groups. An unpaired Student *t* test was used for the subgroup analysis of patients who had received iliopsoas release versus those who had not. A power analysis was performed using a previous study with a mean difference in mHHS of 9 points, with an SD of 16 points.⁸ Using these values and assuming power of 0.8 with $P < .05$ considered significant, we determined that the minimum sample size would need to be 172 patients to achieve significance.

Results

During the study period, 740 hip arthroscopies were performed. Two hundred seventy-eight patients met the inclusion criteria for the study. Of these, 4 were lost to follow-up, achieving a 95.6% rate of 2-year

Download English Version:

<https://daneshyari.com/en/article/4042722>

Download Persian Version:

<https://daneshyari.com/article/4042722>

[Daneshyari.com](https://daneshyari.com)