Simultaneous Versus Staged Bilateral Hip Arthroscopy in the Treatment of Femoroacetabular Impingement

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Purpose: To compare the clinical outcomes and complication rates of patients undergoing simultaneous versus staged bilateral hip arthroscopy for bilateral symptomatic femoroacetabular impingement (FAI). **Methods:** Between 2010 and 2013, a total of 1,800 hip arthroscopy cases were retrospectively reviewed for cases of simultaneous bilateral hip arthroscopy. All patients with minimum 1-year follow-up were included. This group was matched 1:2 for age, sex, and alpha angle, to a control group of patients who underwent staged, bilateral procedures. Patient-reported outcome scores, including the Modified Harris Hip Score (mHHS), the Hip Outcome Score—Activity of Daily Living (HOS-ADL), and the Hip Outcome Score—Sport-Specific Subscale (HOS-SSS) were obtained preoperatively at 6 months and 1 and 2 years postoperatively. **Results:** Eighty-one patients (162 hips) were identified who underwent bilateral hip arthroscopy for symptomatic FAI. Twelve patients (24 hips) who underwent simultaneous bilateral arthroscopy with minimum 1-year follow-up were compared with a matched cohort of 24 patients (48 hips) who underwent staged bilateral procedures. Mean preoperative alpha angle was 65.3° ± 9.6° in the simultaneous group and 65.9° ± 11.2° in the staged group ($P = .6$). At a mean follow-up of 17.8 months (range, 12 to 33 months), there were comparable improvements in simultaneous versus staged patient-reported outcome scores (mHHS 90.8 ± 11 *v* 88.9 ± 12.5, $P = .662$; HOS-ADL 97.3 ± 3.8 *v* 92.6 ± 10.3, $P = .057$; HOS-SSS 93.3 ± 10.2 *v* 86.5 ± 16.6, $P = .203$). The mean single anesthetic traction time was 90.8 ± 21.9 minutes (sum of both hips) in the simultaneous group, compared with a combined 2-anesthetic traction time of 85.7 ± 27.2 minutes in the staged group ($P = .579$). There were no traction-related complications in either group. No patients in the simultaneous group required revision surgery, whereas 1 patient in the staged group required lysis of adhesions at 24 months postoperatively. **Conclusions:** In a small sample, simultaneous bilateral hip arthroscopy is shown to be safe and effective, resulting in similar improvements in patient-reported outcomes at 1-year follow-up compared with staged bilateral procedures. **Level of Evidence:** Level III, case-control study.

Femoroacetabular impingement (FAI), as described by Ganz et al.,[1] is a common cause of hip pain and disability in young, active patients. The abnormal contact produced by femoral head asphericity or acetabular overcoverage results in labral tears and chondral delamination.[1-4] There is concern that these abnormal contact forces and resultant pathology may predispose the joint to secondary osteoarthritis in some individuals, although the cause-effect nature of this relationship has not been concretely established.[5] Hip arthroscopy has gained widespread acceptance for FAI to treat labral pathology and prevent further impingement to improve function and potentially prevent the sequela of degenerative joint disease, although further study is necessary.[6,7]

Frequently, after identification and treatment of FAI, patients have expressed concerns about their risk of contralateral disease and subsequent need for surgery. Numerous attempts have been made to define the rate of bilateral symptomatic FAI in recent years, although this is an area of continual study. Initially, Allen et al.[8] reported radiographic evidence of FAI in up to 78% of contralateral hips in patients presenting with a painful

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hip. However, they reported that only 26% of these patients experienced bilateral symptoms, showing that the presence of radiographic parameters of FAI does not necessarily correlate with symptomatology. Several studies have supported this notion, with radiograph evidence of FAI in 14% to 38% of healthy, asymptomatic volunteers.[9-12]

More recently, Klingenstein et al.[13] identified a 21% rate of bilateral symptomatic FAI in a consecutive cohort of 641 patients who underwent surgical treatment for FAI. They also identified that younger, male patients, and those with an increased alpha angle, were at highest risk of bilateral symptomatic disease.

Treatment options for patients with bilateral disease consist of either staged hip arthroscopy, or less commonly, simultaneous bilateral hip arthroscopy. Although the outcomes after staged arthroscopy for bilateral FAI have been positive,[14] little evidence exists regarding the outcomes of simultaneous bilateral hip arthroscopy.[15]

The purpose of this study was to compare the clinical outcomes and complication rates of patients undergoing simultaneous versus staged bilateral hip arthroscopy for bilateral symptomatic FAI.

We hypothesize that both simultaneous and staged bilateral procedures will prove to be equally efficacious, with improved clinical outcome scores and comparable complication rates.

Methods

All patients were identified from our institutional review board–approved hip registry, which has been maintained since March 2010 with more than 1,800 procedures in 1,600 patients. All patients assessed in our hip preservation center are prospectively enrolled in this registry after obtaining informed consent for participation. This registry contains all demographic information from each patient, as well as pertinent clinical information from each subsequent visit. These data include preoperative, intraoperative, and postoperative clinical findings; radiographic measures; and various patient-reported outcome measures for the standard follow-up visits.

We retrospectively reviewed the database from March 2010 to June 2013 for all patients who underwent bilateral hip arthroscopy for symptomatic FAI. Inclusion criterion was simultaneous, bilateral hip arthroscopy for FAI. Exclusion criterion was follow-up of less than 12 months. This group was matched 1:2 for age, sex, and alpha angle to a control cohort of patients who underwent staged bilateral hip arthroscopy for FAI.

Surgical Indications

All patients undergoing arthroscopy in either group had symptomatic FAI that failed a trial of conservative treatment. Symptomatic FAI is defined as patients with anterior hip or groin pain, with positive provocation maneuvers (flexion, adduction, internal rotation) on physical examination and corresponding radiographic findings (labral tear, elevated alpha angle $>50^{\circ}$). Prior to arthroscopic intervention, all patients had a diagnostic intra-articular injection to confirm that symptoms were attributable to the noted intra-articular pathology.

Staged Versus Simultaneous

After clinical and radiographic confirmation of bilateral, symptomatic FAI, a discussion was held with the patients regarding their preference of staged or simultaneous treatment. All patients received the same choice, regardless of age, gender, body mass index, or pathology present. No randomization process was used. A functional test with simulated 4-point gait was not used to screen patients. If patients chose simultaneous surgery, they underwent bilateral same-day hip arthroscopy, whereas those who elected to avoid bilateral same-day procedures underwent staged hip arthroscopy, 3 to 12 weeks apart.

Surgical Procedure

Hip arthroscopy was performed in the supine position under regional anesthesia with fluoroscopic assistance. Traction was applied to the limb with a well-padded perineal post for countertraction. The hip joint was accessed via standard arthroscopic portals (anterolateral, modified anterior, and distal anterolateral). Pathology was addressed in a sequential manner, starting in the central compartment, followed by the peripheral compartment. Specific interventions were aimed at pathology identified on preoperative imaging or that identified at the time of the index procedure. This included femoral osteochondroplasty, rim trimming, labral debridement, labral repair, psoas release, ligamentum teres debridement, or a combination of these treatments. In both the staged and simultaneous groups, a conscientious effort was made to keep traction time to a minimum, to avoid potential traction-associated complications (i.e., neuropraxia).

After completion of the first procedure in the simultaneous bilateral group, dressings were applied and the patient was taken out of traction. The perineal post was repositioned such that it was lateralized against the medial aspect of the contralateral thigh in preparation for the second arthroscopy. The patient was again placed into traction, with care taken not to overdistract the first surgical side. Fluoroscopic guidance was used to ensure appropriate distraction before the second arthroscopy was begun. Pathology was again addressed in a sequential manner, based on preoperative planning and intraoperative diagnostic findings.

Rehabilitation

Postoperatively, patients in the staged bilateral group were treated without a brace. They were allowed to