Surgical Trends in Arthroscopic Hip Surgery Using a Large National Database

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Purpose: To assess the practice trends in hip arthroscopy, including femoroplasty, acetabuloplasty, and labral repair Current Procedure Terminology, 4th edition (CPT-4), codes that have been implemented since many of the previous studies were published, without concerns for Hawthorne or observer effect as can be seen during a board collection window, and in a larger volume of patients with a more comprehensive database than previous published data. **Methods:** The MarketScan Commercial Claims and Encounters database was searched using CPT-4 codes to identify patients who underwent any arthroscopic hip procedure from 2008 to 2013. Patients identified were characterized by gender, age group, and year of the initial procedure. Regression analysis was used to evaluate differences in surgical trends between individual patient groups delineated by age and gender. The Cochran-Armitage trend test was used to identify significant differences in surgical trends seen yearly. **Results:** A total of 62,782 arthroscopic hip procedures in 31,569 surgeries in 27,997 patients were identified and included from 2008 through 2013. The number of surgeries in the database increased every year. After changes to CPT coding in 2011, femoroplasty became the most common procedure in 2012, comprising 28% of all procedures performed in 2013. Patients ages 40 to 49 underwent the most procedures (7,467, 27%). Females were more likely to undergo any arthroscopic procedure during the study period (.068% vs .041%, $P < .0001$). A total of 2,754 patients (10%) underwent a second surgery during the study period. A total of 1,625 patients (6%) underwent a total hip arthroplasty following an arthroscopic procedure during the study period. **Conclusions:** Arthroscopic hip procedures continue to increase, with femoroplasty, labral repair, and acetabuloplasty being the 3 most common procedures performed. Females are more likely to undergo any procedure, and labral repair is now performed more commonly than labral debridement. **Level of Evidence:** Level IV, cross-sectional study.

The incidence of hip arthroscopy is rising.[1-3] As technology has evolved for hip arthroscopy, indications have expanded, and it has become the preferred modality for a number of musculoskeletal pathologies in the hip. Success of the surgical technique has been well documented for femoroacetabular impingement and labral and chondral pathology in a variety of populations.[4-11]

Despite significant success, questions remain regarding the relative importance of osseous versus soft-tissue procedures as well as the role for hip arthroscopy in patients with known osteoarthritis. Current Procedure Terminology, 4th edition (CPT-4) codes for osseous procedures as well as labral repair were not added until 2011, and their addition allows a more detailed evaluation of procedural trends in hip arthroscopy that was not possible prior to this time.

The growth of hip arthroscopy, particularly in the United States, has been evaluated in previous studies using the American Board of Orthopaedic Surgery (ABOS) database as well as the PearlDiver database.[1-3] The MarketScan Commercial Claims and Encounters Database is a private medical and drug insurance claims database that contains inpatient and outpatient records and services. It consists of data from over 250 insurance companies and employers in all 50 states.

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Our purpose was to assess the practice trends in hip arthroscopy, including femoroplasty, acetabuloplasty, and labral repair CPT-4 codes that have been implemented since many of the previous studies were published, without concerns for Hawthorne or observer effect as can be seen during a board collection window and in a larger volume of patients with a more comprehensive database than previous published data. We hypothesize that the incidence of hip arthroscopy continues to increase and that labral repairs, femoroplasty, and acetabuloplasty are increasing both in number and in proportion when compared with labral debridements alone.

Methods

The MarketScan database contained between 39 and 53 million patients for each year of the study. A search of the MarketScan database was conducted to identify all individuals who underwent any arthroscopic hip procedure from 2008 through 2013 designated by one of the following CPT-4 codes: 29860 (Arthroscopy, hip, diagnostic, with or without synovial biopsy), 29861 (Arthroscopic hip loose body removal), 29862 (Hip arthroscopy surgical with labral and/or chondral debridement), 29863 (Arthroscopy, hip, surgical; with synovectomy), 29914 (Arthroscopic hip femoroplasty, for FAI), 29915 (Hip arthroscopic acetabuloplasty, for FAI), 29916 (Hip arthroscopic labral repair), and 29999 (Unlisted procedure, arthroscopy). CPT-4 codes 29914, 29915, and 29916 were not added until 2011, and, thus, data for these specific procedures were not collected prior to this date. Patients were further characterized by gender, 10-year age groups from under 10 through 60 to 69 years, and year of the initial procedure. Data for procedures were also divided between index procedures and secondary procedures, defined as any one of the aforementioned procedures performed on a separate date from an initial designated procedure, representing either a revision or contralateral procedure. We also identified patients who had any one of the listed procedures and later during the study period underwent a total hip arthroplasty (THA), designated by CPT-4 code 27130.

Multivariable logistic regression was used to evaluate differences in surgical trends between individual patient groups delineated by age and gender. The Cochran-Armitage trend test was used to identify statistically significant differences in trends seen yearly over the course of the study period. All statistical tests were 2-sided, and a $P < .05$ was considered statistically significant. SAS 9.3 (SAS Institute, Cary, NC) was used for all analyses.

Results

A total of 62,782 individual arthroscopic hip procedures (individual CPT codes) performed in 31,569 surgeries in 27,997 patients from 2008 through 2013 were included in our analysis. The number of procedures per number of patients in the database increased every year, with 15,031 total procedures (3.4 procedures per 10,000 patients) in 2013 from 3,763 total procedures (0.91 procedures per 10,000 patients) in 2008 ($P < .0001$, Table 1). The number of surgeries per number of patients in the database also increased every year, with 7,073 surgeries (1.62 surgeries per 10,000 patients) in 2013 from 2,513 surgeries (.61 surgeries per 10,000 patients) in 2008 ($P < .0001$, Table 1). The average number of procedures per surgery did increase from 1.50 in 2008 to 2.23 in 2012, although it decreased slightly to 2.13 in 2013.

Prior to changes in CPT-4 coding, arthroscopic labral/chondral debridement represented the most commonly performed procedure. In 2011, CPT-4 codes for femoroplasty, acetabuloplasty, and labral repair were added, which resulted in decreases in coding for labral/chondral debridement and synovectomy (Table 1, Fig 1). Although labral/chondral debridement remained the most common procedure coded in 2011, it decreased to 16% of all cases in 2013, while synovectomy represented only 8% of all cases by 2013. Diagnostic arthroscopy, loose body removal, and unlisted procedures underwent smaller fluctuations over the study period, ultimately resulting in net decreases to 0.64%, 3%, and 7% of all procedures.

Femoroplasty became the most common procedure in 2012, at 25% of all procedures, and increased to 28% of all procedures by 2013. Labral repair and acetabuloplasty showed similar increases from 2011 to 2013, becoming the second and third most common procedures during that time at 21% and 17% of all procedures, respectively (Table 1, Fig 1). In 2012 and 2013, more labral repair procedures were performed than labral/chondral debridements (Table 1, Fig 1). Females underwent more procedures during study period including (39,739 vs 23,043 for males), were more likely to undergo any arthroscopic procedure during the study period (.068% vs .041%, $P < .0001$), and were more likely to undergo each of the procedures except for loose body removal ($P < .0001$, Fig 2). Males were statistically more likely to undergo a THA after undergoing arthroscopic procedure during the study period (6.3% vs 5.5%, $P = .006$).

Patients ages 40 to 49 underwent the most procedures during the study period, undergoing a total of 16,373 (26%) procedures (Fig 3). Labral/chondral debridement was the most common procedure performed for all age groups when looking at the entire study period. Femoroplasty was the second most common procedure performed for all age groups except children under 10 and adults over 60.

A total of 2,754 patients (10%) underwent a second surgery during the study period.