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CORR Insights®: What Factors Predict Conversion to THA After Arthroscopy?

Brian T. Barlow MD

Where Are We Now?

Hip arthroscopy is being used with increasing frequency in adults, growing by 600% in American Board of Surgery Part II examinees between 2006 and 2010 [3]. At least part of this enthusiasm for hip arthroscopy is driven by early reports demonstrating high levels of return to sport, low complication rates, and rare

THA conversion in high-level and professional athletes who underwent arthroscopic surgery for labral injuries and femoroacetabular impingement (FAI) [4, 13]. But as the indications for hip arthroscopy broadened, the frequency of THA conversion increased [1, 17]. In fact, a recent population-based study reported that 12% of hips treated arthroscopically underwent conversion to THA at 2-year followup [15]. A systematic review of more than 6000 hip arthroscopies undertaken primarily for labral repair and FAI correction also found that nearly 3% underwent THA conversion at a mean of 16 months [8]. Long-term studies found even more sobering results than the early short-term studies of high-level athletes. The 10-year THA-free survivorship was 63% in a cohort of 340 hip arthroscopy patients [9].

Results of arthroscopic labral repair in older patients, especially those with arthritis or chondral injury have been unfavorable. The THA conversion rate in older patients with underlying chondral injury or arthritis approaches 20% to 30% in the initial year after arthroscopy and more than 80% with longer followup [5, 16]. Age, chondroplasty, decreased joint space (< 2 mm), and underlying arthritis have been found to be independent risk factors for THA conversion after hip arthroscopy [5, 8, 15, 16].

THA conversions following hip arthroscopy often occur early. Bedard and colleagues [1] found that 36% of THA conversions occurred within 6 months, 60% within 1 year, and 100% within 4 years following hip arthroscopy, again noting that age > 50 years of age and chondroplasty increased the risk for THA conversion. The fact that the majority of THA conversions occur so soon after arthroscopic surgery suggests that there are patient, imaging, and operative factors that can be used to identify and quantify risk of complications. These patients are likely better served with continued nonsurgical care until they meet indications for arthroplasty [2].

This CORR Insights® is a commentary on the article "What Factors Predict Conversion to THA After Arthroscopy?" by Redmond and colleagues available at: DOI: 10.1007/s11999-017-5437-z.

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B. T. Barlow MD (✉)
Hospital for Special Surgery, Adult
Reconstruction and Joint Replacement,
535 East 70th Street, New York,
NY 10021, USA
e-mail: brianbarlow05@gmail.com

Where Do We Need To Go?

We need better definitions in our clinical research about what we consider a successful arthroscopic hip-preserving operation, since there is little consensus on this point [2]. Conversion to THA after 10 years of good function might be quite satisfying to a 45-year-old patient; THA conversion less than 12 months after an arthroscopic chondral débridement probably would not be. Likewise, we probably can agree that a young patient who returned to sport after arthroscopic femoral neck osteoplasty for FAI had a successful intervention, while one whose disabling symptoms remained unchanged did not benefit from the arthroscopic hip procedure, even if the native hip is retained. What about all the patients whose results lie between those extremes?

A substantial number of patients having hip arthroscopy who convert to THA do so shortly after surgery, which suggests this subgroup of patients may have undergone an unnecessary procedure. However, the reason for THA conversion is currently unclear. Do these patients have radiographic progression of disease prior to THA? Alternatively, do they undergo THA conversion due to persistent symptoms without radiographic osteoarthritis? Additionally, as THA conversion is clearly more common in the older age

populations, it begs the questions of whether age influences the likelihood of THA conversion. Do older patients undergo more THA conversion because their disease is worse or because surgeons are less reticent to offer a THA to an older patient compared to a younger patient even if the symptoms are identical? Should hip arthroscopy patients be broken into separate cohorts when investigating clinical outcomes and survivorship? How should these cohorts be divided? Is age or degree of chondral injury more important?

Clearly, we should seek a 0% THA conversion rate in young patients, but a substantially higher THA conversion rate may be acceptable in an older cohort with more chondral damage if a demonstrable quality of life improvement over a reasonable time period can be achieved. Having said that, it appears that for a certain subset of patients, hip arthroscopy in the setting of advanced age or chondral damage provides little to no quality of life benefit, akin to the studies of arthroscopy for the arthritic knee undertaken 15 years ago [11].

The current study by Redmond and colleagues focused on hip arthroscopy undertaken for labral tears. The MRI diagnosis of a labral injury is common, yet the natural history of the labral tear is not well described [6, 10]. Some authors have postulated that labral

tears rarely occur in the absence of bony deformity [12, 18], which raises the question of whether a labral tear without bony deformity will lead to hip arthritis [7, 10]? The labrum has an important biomechanical role in hip stability and is the main regulator of intraarticular fluid pressure—both functions are critical for long-term cartilage health [7, 14]. Yet the causal relationship between labral injury and progressive hip arthritis has not yet been shown and the natural history of the isolated labral tear remains unanswered.

How Do We Get There?

A simple radiographic study that includes a cohort of patients who had hip arthroscopy and underwent THA conversion would help define the indications for conversion. This study should compare the joint space and Tönnis Grade using the pre-arthroscopy, initial post-arthroscopy, and preoperative THA radiographs. By doing this, we could determine whether patients undergoing THA conversion have radiographic osteoarthritis progression. The lack of radiographic progression would imply that unresolved symptoms after hip arthroscopy led to THA conversion.

Next, we might ask whether hip arthroscopy can be a “bridging”

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operation in a middle-aged patient with chondral injury. Is there sustainable quality of life improvement that can be achieved over a reasonable time period (5 to 10 years) with the expectation that a THA will eventually become necessary? This question is sensitive to biases and is best answered with a randomized trial that allocates middle-aged (> 40 years of age) patients with varying levels of chondral pathology into surgical and non-surgical arms. The randomized control trial study design also would also help answer the “million-dollar” question—whether hip arthritis can be slowed or prevented with FAI correction.

Case-control studies could help determine whether age or time to THA conversion influence the patient-reported outcome and satisfaction with THA conversion. Are younger (< 40 years of age) THA conversion patients less satisfied with the outcome of primary THA in a matched cohort? Does early (< 12 months) versus late THA conversion affect the patient-reported outcomes and satisfaction? This study would also help determine if there is a quality of life benefit to hip arthroscopy that converts to THA after a longer time period reinforcing the “bridging operation” concept.

Finally, defining the natural history of the MRI-diagnosed labral tear will be a difficult question to answer, as it requires decades of longitudinal

followup to determine if it increases the risk of hip osteoarthritis in the absence of bony deformity.

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