

Editorial Commentary: The Importance of Capsular Closure Following Hip Arthroscopy—Leave No Trace: An Outdoorsman’s Ramblings



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Abstract: After a decade-long paradigm shift and an evidence-based enormous increase in the prevalence of hip arthroscopic procedures, hip capsular closure following arthroscopy, once a rare procedure, is now performed in the majority of surgical cases. This results from improved surgeon experience, refined surgical technologies and techniques and an explosion of research regarding stability of the hip joint. Once viewed as inherently stable, it is become clear that meticulous capsular management and closure can not only maintain joint stability but is a treatment for and/or prevents micro-instability. Recent research shows that hip capsular closure can improve outcomes and return to sport rates in the highest demand athletes having hip arthroscopy. Close the capsule!

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I have learned much throughout my life from my time spent in the great outdoors. An old adage among outdoorsmen and outdoorswomen is “leave no trace”. For the uninitiated, this statement (or should I say order) refers to the practice of not only picking up trash, and properly extinguishing campfires, but leaving the natural world as one found it, so that future visitors can experience the same untouched beauty as those before. It is a principle that I find myself applying not only on trails or at campsites, but in the operating room as well. If anatomy is disturbed on an approach, or to gain access, should we not repair what we have disrupted? The answer to this question, however, is not always an easy one.

The optimal management of the capsule during arthroscopic surgery on the hip is, without a doubt, a “hot” area of research: Interportal or t-shaped? To repair or not to repair? Always, sometimes or never? These are just a few of the questions that invariably run through the mind of keen arthroscopists before, during, and after said procedures. Attendees at any of the major

sports conferences over the past five years have surely been exposed to heated debates surrounding what is and is not best practice when it comes to the femoroacetabular joint capsule.

While comparatively young in the field of sports medicine, the growth of hip arthroscopy has been explosive, to say the least. A study using the NSQIP database demonstrated a 25-fold increase in the prevalence of hip arthroscopy from 2006 to 2013, with similar trends seen in the MarketScan Commercial Claims and Encounters database.^{1,2} As surgeons worked hand-in-hand with industry, new instruments and technologies were developed and released, which helped to accelerate the profound learning curve. Surgical steps once regarded as burdensome quickly became much more painless.

Nowhere is this phenomenon clearer than the techniques for capsular management. Increased surgeon experience, combined with new technologies developed secondary to cutting-edge research, led to a massive paradigm shift with respect to the capsule. In 2009, only 7% of capsulotomies were repaired; by 2017, this number jumped to 58%.³ It comes as no surprise that during this time, a plethora of research regarding the importance of capsular closure came to print.⁴⁻⁷ As the biomechanical importance of the capsule was further elucidated, surgeons (appropriately) responded by paying respect to this critical structure and closed the holes they made. Furthermore,

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new technologies and techniques were developed, which greatly expanded surgeons' armamentaria when it came to this critical surgical step.

During the nascency of hip arthroscopy, the prevailing thought was that the hip was an inherently stable joint and, therefore, routine closure and/or plication of an access-granting capsulotomy were rare. As our understanding of the capsule's contribution to hip joint stability increased, appropriate capsular management was slowly brought into the limelight.⁸ Research revealed that the capsule played an important role in the maintenance of joint stability and that repair may actually improve stability.^{4,5,7} Around the same time, the idea of hip microinstability gained traction.⁹⁻¹¹ This oftentimes painful pathology was identified as a risk factor for poor outcomes following arthroscopic management of femoroacetabular impingement.^{9,10} It was postulated that capsular closure could treat and/or prevent microinstability,⁵ and outcome studies supported this assertion.⁵

In the current study, "Competitive Athletes Who Underwent Hip Arthroscopy With Capsular Repair Demonstrated Greater Improvement in Patient-Reported Outcome Scores Compared to Those Who Did Not Undergo Repair," Jimenez, Lee, Owens, Paraschos, Maldonado, and Domb report retrospectively on a cohort of competitive athletes who underwent capsular repair and compared their outcomes to a propensity-matched cohort of competitive athletes who did not undergo repair.¹² First, the authors should be commended for their work. Their methodology is pristine and truly captures the power of a large research database. Leveraging the power of propensity-matching, the authors are able to hopefully stymie the influence of preoperative demographics or patient-specific characteristics on outcomes. Their results add further fuel to the fire that is capsular repair; patients in the repair cohort demonstrated a statistically and clinically significant improvement in outcomes, which outpaced the patients whose capsulotomies were not repaired. Furthermore, return-to-sport rates were higher in the repair cohort, although this comparison did not reach statistical significance. Interestingly, patients in the unrepaired cohort still demonstrated statistically significant increases in patient-reported outcome scores, albeit to a lesser degree than the repair cohort. Promisingly, capsular repair does not appear to increase the rate of complications. The takeaway: well-indicated and well-performed hip arthroscopy, with correction of any underlying osseous abnormality and repair of labral injury, can improve outcomes even in the absence of capsular closure. We believe in the power of routine capsular closure, and perform it ubiquitously during hip arthroscopy.

This most recent study, in our opinion, provides icing on the cake in support of capsular closure. Not only can

this critical step help to improve outcomes and prevent the progression or genesis of microinstability, but it appears that it can help the highest of demand athletes return to sport at a higher rate. If "leave no trace" is the mantra of hikers and campers everywhere, then "close the capsule" should be shouted from the rooftops of every operating room in which hip arthroscopy is performed.

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