

Editorial Commentary: Gadolinium Intra-Articular Contrast Magnetic Resonance Imaging Is Not Required for Every Patient Undergoing Hip Arthroscopy, but Contrast Magnetic Resonance Imaging Plus Computed Tomography With 3-Dimensional Reconstruction Are Essential for Patients Requiring Revision



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Abstract: For arthroscopic hip surgeons, accurate identification of symptomatic pathology is required. Gadolinium-contrast magnetic resonance arthrography (MRA) is an important imaging option but not necessarily for every patient. Contrast carries some risks, and for patients with acute pathology, effusion may mitigate against the need for contrast. In addition, higher field 3T magnetic resonance imaging shows exceptional detail, comparable sensitivity, and superior specificity to MRA. However, in the revision setting, contrast is indicated to delineate recurrent labral tear versus post-surgical changes, as well as to best show the degree of capsular deficiency. In addition, in the revision setting, computed tomography scan without contrast with 3-dimensional reconstruction also is indicated to evaluate for acetabular dysplasia, surgical over-resection on the acetabular and femoral side, and femoral version. Each patient should be carefully evaluated; MRA with intra-articular contrast is a valuable tool, but not always required.

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For arthroscopic hip surgeons, the successful treatment of our patients is won and lost by the accurate identification of what the real pathology is. The inability to critically assess and make that determination will often lead to a poor outcome before the traction to distract the hip is ever engaged. Over the past 2 decades, our clinical understanding, diagnosis, and treatment of femoroacetabular impingement has improved tremendously. However, we still have major questions to answer when it comes to appropriately and comprehensively imaging our patients. Advanced

imaging (eg, magnetic resonance imaging [MRI]) serves as an important part of our clinical decision, but it is paramount not to rely on it as the sole determinant as to whether to operate or what type of surgery is needed to be performed. An increased recognition and diagnosis of femoroacetabular impingement has been paralleled by an increasing surgical intervention for its treatment.¹⁻³ Subsequently, there has been a steady increase in the volume of revision hip arthroscopic surgery being performed.^{3,4} It is with great interest that we try to better define how we should image our patients both in the primary and revision setting and when surgery is indicated that we have appropriately and comprehensively evaluated them.

I read the article by Lee, Kim, and Ha entitled “Hip Magnetic Resonance Arthrography Using Normal Saline Is Less Accurate Than Using Gadolinium-Based Contrast Agent” with great interest.⁵ This was a retrospective study that compared the diagnostic performance of hip magnetic resonance arthrography (MRA)

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with a gadolinium-based contrast agent versus one with normal saline (NS) as the contrast agent when imaging for intra-articular pathologies. In total, 68 hip studies from 67 patients were independently reviewed by 2 blinded radiologists for labral tears, cartilage abnormalities, or ligamentum teres tears. The authors have provided us valuable clinical information that shows that using gadolinium-based contrast agent is more accurate than NS as a contrast agent; however, NS is still an alternative that can have some diagnostic value.

This current study helps to answer and address important questions regarding hip imaging studies. First, at my institution, there have been consistent challenges with the supply chain on a wide range of items as part of the collateral damage from the pandemic itself and the mitigation strategies employed by our own country and those of our trading partners. As I was reviewing this article, I had just received a communication regarding the shortage of iodinated contrast agents amounting to 20% of normal supply volume. Although unrelated directly, it highlighted the possibility of having to use alternatives and whether that alternative would be acceptable from a diagnostic standpoint. Second, there has been concerns and questions regarding the risk factors or potential side effects of gadolinium-based contrast agent the potential chondrotoxicity that it might have.⁶⁻⁸ The study helps provide us with the accuracy of a non-gadolinium alternative which some patients might prefer.

In my opinion, the use of a gadolinium-contrast MRA is important imaging option but not necessarily needed to be ordered reflexively on every patient. In my practice, I believe a contrast study is indicated in patients who are potential revision surgical candidates for 2 reasons. First, delineating between recurrent labral tear versus postsurgical changes is a challenge and the increased sensitivity that contrast provides is valuable.^{9,10} Second, the degree of capsular deficiency from previous surgical intervention might be underappreciated from a noncontrast study which, if present, would likely change the surgical plan. Furthermore, I believe it is also important to obtain a computed tomography scan without contrast with 3-dimensional reconstruction to evaluate for acetabular dysplasia, surgical over-resection on the acetabular and femoral side, and femoral version, all of which could impact one's surgical approach.

For high school, college, and professional athletes or patients with acute hip injuries with no surgical history, I prefer to order a noncontrast 3T MRI. Often, in the acute setting, an intra-articular effusion is present that serves as a contrast agent. The higher field 3T imaging has exceptional detail, lower scan times, and increased signal, which leads to improved signal-to-noise (ratio). A recent meta-analysis demonstrated comparable

sensitivity and superior specificity with 3T MRI compared with MRA.¹¹

Over time, challenges like the current supply chain shortage will hopefully not play a factor in our ability to order certain imaging studies. However, as we move forward, continuing to evaluate and refine our imaging strategies is important. Each patient should be carefully evaluated and to default to MRA with intra-articular contrast might not always be needed but still is an important tool in the revision setting.

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