

Editorial Commentary: Ultrasound-Guided Injection With Dynamic Assessment Could Improve Outcomes in Atypical and Revision Hip Arthroscopy Patients: But Today, Few Are Trained to Hear at Such High Frequencies



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Abstract:: Imaging modalities for hip disorders all have their strengths and weaknesses. Magnetic resonance imaging is superior for evaluating soft tissue pathology, computerized tomography best characterizes osseous morphology, and plain radiographs can accurately depict 2-dimensional anatomy and are familiar to most clinicians. Ultrasound-guided injections have become commonplace in the musculoskeletal arena. Ultrasound evaluation of musculoskeletal anatomy has received increased attention, has the ability to image soft tissue and osseous structures, and more importantly, has the ability to dynamically evaluate these structures in real time. A noninvasive dynamic assessment of the hip region could be an absolute game changer for the hip preservation/sports medicine community in the diagnosis of atypical hip pain, femoroacetabular impingement, and labral tears. Widespread ability and expertise to perform these dynamic ultrasound assessments, however, is not in place at this time. We need more training and studies to best harness the potential benefits of these sound waves.

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Ultrasound (US) has gained increased attention as an injection guidance and diagnostic tool for musculoskeletal pathologies.¹⁻⁸ In comparison to magnetic resonance imaging (MRI), computerized tomography (CT), and plain radiographs, US is clearly in its infancy with regard to widespread use and ability to interpret results. In addition, the literature is fairly limited in comparison to other imaging modalities for musculoskeletal pathology. Ultrasound has been shown to be very efficacious for hip joint injections, and a handful of studies have supported its ability to diagnose labral tears and femoroacetabular impingement (FAI).¹⁻⁸ More importantly, US has the ability to provide a dynamic assessment of the hip to determine

intra-articular or extra-articular impingement while assessing the patient's response to these maneuvers.¹ Currently, however, there are very limited data regarding dynamic US. Ultrasound, with its ability to guide a diagnostic injection and assess the hip joint and potential extra-articular pain generators, could prove to be a game changer, in particular for challenging patients who present after prior failed surgical procedures or with atypical hip presentations.

In "Ultrasound and Ultrasound-Guided Hip Injection Have High Accuracy in the Diagnosis of Femoroacetabular Impingement With Atypical Symptoms,"¹ Gao, Fu, Wu, Liu, Cui, and Xu evaluated 78 consecutive patients with FAI, atypical symptoms (posterior, low back, thigh, knee) on typical impingement tests, and no classic groin/anterior hip-related pain. Based on a positive response to an ultrasound-guided intra-articular hip injection, 36 patients ultimately underwent hip arthroscopy.¹ As in previous studies, the authors found that ultrasound had a high level of sensitivity, positive predictive value, and accuracy in diagnosing cam impingement and labral tearing.¹ After arthroscopic surgical management, these patients

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presenting with atypical symptoms had significant improvement in the modified Harris hip score (before, 57; after, 85) and visual analogue pain score (before, 5.9; after, 1.2) at a mean of 22.5 months' follow-up.¹

One of the most remarkable findings of the study was the ability to achieve significantly improved outcomes in a very challenging patient population. Although there was no control group, the degree of improvement and final scores are in line with results after arthroscopic FAI correction with typical symptoms. But we must carefully sort through the data to better understand how the authors achieved these outcomes. The atypical posterior pain with the Faber test might be partially explained by posterior rim overcoverage or impingement, as the mean lateral center angle was 40° in these patients, indicating a high prevalence of global acetabular overcoverage.

We cannot assume, however, that the atypical symptoms were all related to intra-articular structures. The definition of a positive response to the injection, which also included a corticosteroid, is not just in the first few hours (anesthetic response), but any time in the first week. This creates some doubt that all of the positive responses to the injection were the result of intra-articular pathology.

Labral tears and FAI were universal in the patients in this study.¹ We know, however, that labral tears and FAI are common in the general population and even more prevalent in an athletic population.^{9,10} A number of studies, including 2 that I published about NFL prospects and NHL players,^{9,10} have shown a high prevalence of labral tears and a prevalence of FAI in >90% of these athletes regardless of symptoms. Therefore, the presence of these pathologies does not confirm an intra-articular source of pain. Another potential source for posterior pain is ischiofemoral impingement (IFI), a result of the proximal femur contacting the ischial tuberosity in extension. The authors did evaluate for this with ultrasound and examination, and 3 patients presumably had surgical treatment for IFI as well.

An important point here is the variability of pain-generating structures identified and managed arthroscopically/endoscopically by the authors. I commend the authors for their dynamic US evaluation and comprehensive management in these cases. They appear to have developed a game plan for these difficult patients that we should all emulate. I cannot overemphasize the importance of the authors' comprehensive management in this challenging group. Without this understanding, surgeons will not get the same results in these atypical symptom patients with traditional intra-articular FAI management.

But could the improvements in this cohort with atypical symptoms result from an indirect benefit of FAI correction? I suspect this played an important yet not

emphasized role. It is not infrequent for me to encounter a patient who says that back pain went away after the FAI corrective procedure. I make no promises, but it does happen more than I anticipate. I am a believer in the kinetic chain and the fact that one link can affect another. We previously published a study looking at elite athletes with both symptomatic FAI and symptomatic athletic pubalgia/core muscle injury.¹¹ My conclusions were that managing both disorders led to the highest rate of return to athletics and the most predictable results. But if you dive deeper into the results section, you will notice that the core muscle symptoms resolved in 50% of these athletes after an isolated FAI corrective procedure was performed. Correction of moderate or large degrees of hip impingement will lead to markedly improved hip range of motion and mobility. I believe that this improved mobility results in less stress on extra-articular structures and might account for the resolution of some of the atypical symptoms in the current study. I cannot currently prove this theory—but I do firmly believe in the concept.

In the end, the “sonographic window” is cracked open, but the breeze is only faintly appreciated as we begin to examine the potential for this diagnostic modality. I implore the orthopedic and radiology community to increase training for diagnostic ultrasound beyond simply guiding injections. I believe that dynamic ultrasound assessment is a tool that has the opportunity to dramatically change our ability to manage and understand patients who present after failed hip procedures and with atypical symptoms. If we can master the technique and produce further research regarding dynamic ultrasound, we will better sort through these all-too-challenging cases and potentially offer an evidence-based hope for a subset of patients previously labeled as surgically untouchable.

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