

## Authors' Reply



We greatly appreciate the comments made by Drs. Waterman and Johnson regarding our publication in the ISAKOS Biologics Series Part II supplement of the May 2015 issue of *Arthroscopy*, entitled “Synthetic Devices for Reconstructive Surgery of the Cruciate Ligaments: A Systematic Review,”<sup>1</sup> along with the editorial comment made by Dr. Lubowitz in the same supplement.<sup>2</sup> The Ligament Augmentation and Reconstruction System (LARS) device, in particular, draws the most attention.

There are inherent weaknesses in systematic reviews, at least in part due to reporting biases, such as publication bias and outcome reporting bias.<sup>3,4</sup> In the Discussion section of this review, we allude to “the paucity of well-conducted clinical trials” that qualified for inclusion. We did not attempt to locate unpublished material, and we excluded non-English-language studies. Both of these factors may have resulted in the omission of papers reporting poor outcomes for synthetic devices. While we respect that Drs. Waterman and Johnson have anecdotally identified a 40% failure rate for the LARS posterior cruciate ligament device in their own patients, we were unable to identify any publication reporting this figure or others with similar experiences. Therefore it was not possible to include such data in the systematic review.

Aseptic synovitis may well be a concern in knees that have undergone LARS surgery. The cited publication on this subject was a case report<sup>5</sup> and, therefore, did not meet the inclusion criteria for our systematic review. We did not find that the literature is replete with publications reporting that synovitis is a major complication of the use of the LARS device. Our personal anecdotal experience does, however, suggest that the rate of synovitis is higher than the figures reported in the review (0.2% to 1.3%). Once again, the discrepancy is potentially a consequence of outcome reporting or publication bias. As we emphasized in the review, only half of the LARS studies reported on sterile effusion and synovitis and we still maintain that the “apparently lower incidence should therefore be interpreted with caution.”<sup>1</sup> While none of the authors recommend the use of the LARS device in elite-level athletes, we do note with interest that there are at least 3 professional Australian Rules footballers currently playing at the highest level for more than 2 seasons after an anterior cruciate ligament reconstruction using the LARS device.

Whatever the personal opinions of the authors of the systematic review might be, the findings of the systematic review reflect the currently available literature. Unfortunately, this is composed of Level II to IV studies with variability and heterogeneity in outcome reporting as we describe. Whether or not ligament repair, perhaps in combination with an internal brace of appropriate material, becomes a successful innovation in the treatment of the cruciate-injured knee—as

speculated by Drs. Waterman and Johnson, as well as Dr. Lubowitz—remains to be seen. In the future, we feel that reporting standard outcomes in conjunction with rigorous clinical trials will allow unbiased comparison and facilitate systematic review and meta-analysis to evaluate treatments for the anterior cruciate-deficient knee, including an internal brace.

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## Regarding “Efficacy of Magnetic Resonance Imaging and Clinical Tests in Diagnostics of Wrist Ligament Injuries: A Systematic Review”



To the Editor:

It was with great interest that we read the article “Efficacy of Magnetic Resonance Imaging and Clinical Tests in Diagnostics of Wrist Ligament Injuries: A Systematic Review” by Andersson et al.<sup>1</sup> It is a well-

conducted review. We agree completely with the conclusion that wrist arthroscopy remains the reference standard for diagnosing triangular fibrocartilage complex (TFCC) and intercarpal ligament lesions.

It is of notice that all referred studies were performed under optimal circumstances, that is, use of wrist coils, highly trained and specialized musculoskeletal radiologists, and minimum accuracy of standard-resolution 1.5-T magnetic resonance imaging (MRI). We evaluated the findings of 401 externally performed MRI scans and correlated the former findings to our wrist arthroscopies. Our findings showed an average specificity of 60% and sensitivity of 69% regarding TFCC lesions.<sup>2</sup> Our study showed that hand surgeons have to deal with many different MRI protocols that are mostly not specifically designed for this anatomic region and this reduces the diagnostic efficacy. Furthermore, most radiologists were not specialized. Therefore, we rely on our standardized clinical examination protocol and, in accordance to that, perform wrist arthroscopy if necessary.<sup>3</sup>

MRI arthrography might be a promising tool in the future, but its widespread use has not been facilitated yet. Even though wrist arthroscopy remains the reference standard for TFCC and intercarpal ligament lesions, the intraobserver and interobserver reliabilities are not excellent. This is a decisive drawback after all.<sup>4,5</sup>

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## Author's Reply



It was with great interest that I read the letter to the editor of Drs. Spies and Unglaub concerning our article "Efficacy of Magnetic Resonance Imaging and Clinical Tests in Diagnostics of Wrist Ligament Injuries: A Systematic Review." I agree with their comments. The radiologic and clinical diagnostics of triangular fibrocartilage complex (TFCC) injury is challenging. The interpretation of the important peripheral attachment tears of the TFCC with magnetic resonance imaging (MRI) is even more difficult than central tears.<sup>1</sup> The small sizes and oblique orientations of the radioulnar ligaments, ulnar attachments, and ulnolunate and ulnotriquetral ligaments make visualization of the important peripheral structures much more difficult than that of the central disks. It has been generally accepted that appropriate parameter settings of MRI are most important for high accuracy.<sup>2</sup> In 2013 Ringler<sup>2</sup> proposed an MRI strategy for the wrist ligaments to increase accuracy in diagnosing wrist ligament injuries, including magnetic strength of 1.5 T or greater; dedicated wrist coils; field of view (FOV) of 10 cm or less; slice thickness of 2 mm or less; matrix of 384 × 256 or greater; and MRI sequences including T1, fat-saturated proton density or T2-weighted fast-spin-echo (FSE). However, in our opinion, most important is an experienced, dedicated radiologist working closely with the hand surgeon. The article concerning quality rating of MRI regarding TFCC injuries by Hahn et al.<sup>3</sup> is of great interest and also impressive when it comes to the number of patients. Unfortunately, it did not match our strict inclusion criteria in terms of language and data available. Furthermore, I agree that clinical experience and a standardized clinical examination protocol<sup>4</sup> are essential in diagnostics of wrist ligament injuries. However, in 1995 LaStayo and Howell<sup>5</sup> showed that provocative wrist tests proved to be more effective in predicting the absence of injury than its presence. In our systematic review, Prosser et al.<sup>6</sup> reached a borderline-cutoff negative predictive value (NPV) of 94% for clinical provocative tests of the lunotriquetral ligament, but for the TFCC, the NPV was only 55%. In summary, negative results of MRI or clinical provocative tests are still unable to safely rule out the possibility of clinically relevant tears to the TFCC and other wrist ligaments, which makes further diagnostic evaluation with wrist arthroscopy necessary.

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