Editorial Commentary: Comparing Medial and Lateral Meniscal Root Tears Is Like Comparing Apples and Oranges

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Abstract: The importance of treating meniscal root tears has been increasingly recognized, and surgeons have to make conscious decisions routinely regarding repair for select patients. The clinical and patient demographic differences between medial and lateral meniscal root tears are important and ultimately leave us wondering whether outcome differences are due to unique anatomic factors or the patient population sustaining these injuries.

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In this issue of *Arthroscopy*, Krych, Bernard, Kennedy, Tagliero, Camp, Levy, and Stuart[1] present a study entitled "Medial Versus Lateral Meniscus Root Tears: Is There a Difference in Injury Presentation, Treatment Decisions, and Surgical Repair Outcomes?" They clearly show that there is a difference in the injury presentation, treatment decisions, and surgery repair outcomes between medial and lateral meniscal root tears. In addition, they study further clarifies the difference between patient age, body mass index (BMI), and outcome scores for these 2 types of pathologies.

Regarding many orthopaedic procedures, there are subpopulations that succeed at high levels regardless of the procedure performed. In sports medicine, elite athletes can overcome extreme odds in comparison to our more sedentary patients; in addition, the incentives and motivations are very different between these patient populations. In their study, Krych et al.[1] are mainly comparing a young, highly athletic population with concomitant anterior cruciate ligament (ACL) tears (i.e., lateral meniscal root tears) with a much more sedentary, aged population with concomitant degenerative changes and a higher BMI (i.e., medial meniscal root tears). In the end, is it more about the injury (meniscal root tear) or more about the patient population we encounter?

This article primarily covers type II medial and lateral meniscal root tears.[2] In this type of tear, either the root is torn off its bony attachment or the root is torn within 1 cm of the root attachment and it is functionally equivalent to a complete meniscectomy.[3] In the current study, Krych et al.[1] report on 141 meniscal root tears, comprising medial root tears in 77% (n = 109), lateral root tears in 21% (n = 30), and both medial and lateral root tears in 1% (n = 2). Subanalysis was performed on 62 patients who underwent root repair with an average 41-month follow-up. The authors found significant improvements in patient outcome scores postoperatively at most recent follow-up, with lateral meniscal root repair patients having significantly higher International Knee Documentation Committee and Tegner scores compared with medial meniscal root repair patients ($P < .05$).[1] This is not surprising considering the fact that medial root tear patients were significantly older and had a higher BMI, more osteoarthritis, and a higher rate of meniscal extrusion than their lateral meniscal root repair counterparts.[1]

It is very clear that this article reflects the evolution in orthopaedics in the treatment of this reported silent epidemic. When these patients first received their diagnoses and their data were collected in the authors' database, it was about the time of one of the first

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published case reports on root repairs,[4] and the treatment of root tears has now evolved to the point at which we are advocating that meniscal root tears be repaired to slow the progression of osteoarthritis. In addition, a cost-benefit analysis for posterior medial root tears has determined that they should be repaired whenever possible.[5]

An important finding in the study of Krych et al.[1] is that patients with medial meniscal root repairs do quite well. Although the outcomes associated with lateral meniscal root repairs are commonly confounded by concurrent ACL reconstruction in most cases, type II posterior medial meniscal root tears commonly occur in isolation and in an older population with lower-energy mechanisms of injury.[6,7] Whereas lateral meniscal root tears usually occur with higher-energy trauma and sports injuries, medial meniscal root tears primarily occur during squatting and lifting, gardening, or carpet laying or sometimes occur with activities of daily living such as climbing stairs. In these patients, the outcome scores should be compared with those of other surgical procedures that we perform with underlying arthritic conditions in this age group, in which the outcome scores for the modified Cincinnati score are somewhat less comparable to those found for the International Knee Documentation Committee score with meniscal repairs at similar times of follow-up.[8,9]

We certainly agree with Krych et al.[1] that most lateral meniscal root tears occur concurrently with ACL tears. We also agree that lateral meniscal root tears should be repaired, not only to potentially slow the progression of ipsilateral-compartment osteoarthritis but also because a lateral meniscal root tear contributes to increases in anterior tibial translation on the Lachman test and increased internal rotation for the pivot-shift mechanism.[10,11] In most cases, medial root tears have more extrusion in comparison to lateral root tears, which was also a key finding by Krych et al. However, a surgical pearl to keep in mind during medial meniscal root repair is to perform a sufficient peripheral release to reduce the meniscus and address extrusion with anatomic fixation.[12]

As the treatment of this silent epidemic evolves, it is also important for surgeons to recognize the anatomy of all 4 meniscal root attachments to ensure that proper surgical repair of these tears is performed.[13-15] In addition, it is important to avoid iatrogenic injury, which has been reported or biomechanically assessed for all 4 meniscal root attachments.[16-18] Considering the biomechanical functions of the meniscus, especially the medial meniscus, it is important to ensure that the meniscal root attachment is repaired back to an anatomically correct position because nonanatomic repairs fail to entirely restore the biomechanical function of the meniscus.[19] This study reinforces the fact that future studies should not include all root tears when evaluating outcomes and lateral and medial root tears' outcomes should be separated.

Overall, we certainly agree with Krych et al.[1] on the presenting symptoms for these types of tears and the patient outcomes. In particular, we agree that age is less important in determining surgical repair candidacy and that the amount of existing osteoarthritis should be primarily assessed when determining whether one performs a meniscal root repair in a particular patient. As noted in this article, it is important to point out that some lateral meniscal root tears do occur in isolation, without a concurrent ACL tear; this occurred in 13% of cases (4 of 30) in this study.[1]

Going forward, there is more and more compelling literature advocating that both medial and lateral meniscal root tears be repaired in symptomatic patients without significant arthritis. Patients with lateral meniscal root tears commonly have concurrent ACL tears. Therefore, surgeons who perform ACL reconstruction will encounter these tears even if they do not recognize them; such tears can sometimes be challenging to identify preoperatively by magnetic resonance imaging. In addition, ACL surgeons need to recognize lateral meniscal root tears because missing them certainly increases the risk of an ACL reconstruction graft failing.[20] Medial meniscal root tears affect middle-aged individuals, occur in isolation, and are more common in female patients. The article by Krych et al.[1] adds further fuel to the fire about what needs to be assessed with a patient's history and physical examination and determining whether the pathology may include medial or lateral meniscal root tears. We commend the authors for their findings. In the end, if we attempt to compare medial and lateral meniscal root outcomes, we are clearly comparing apples and oranges or, maybe better stated, comparing young athletes and older sedentary patients—the winner of the race is predictable! There is no comparison.

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