Letter to the Editor

Letter to the Editor: Does Combined Intra- and Extraarticular ACL Reconstruction Improve Function and Stability? A Meta-analysis

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I read with great interest the recent meta-analysis on combined intra and extraarticular ACL reconstruction by Rezende and colleagues. This paper provided an excellent review of the existing literature on this topic, demonstrating slightly reduced

laxity but no clear clinical or functional advantage for the combined procedure versus ACL reconstruction alone. Both this paper and the thoughtful insights provided by Dr. Baumfield [1] argue convincingly that further studies are necessary to determine the possible clinical benefits of extraarticular procedures when performing ACL reconstruction.

When reviewing the large (and growing) body of research concerning extraarticular reconstructions, however, one should perhaps consider what problem(s) the procedure is actually designed to address. Extraarticular procedures have been promoted for their potential to restore normal anterior laxity, reduce excess internal tibial rotation, and better control knee motion during the pivot shift test. In vivo biomechanical studies, however, raise doubts about the need to further constrain internal rotation. In fact, the vast majority of high-quality in vivo knee kinematics studies during functional activities have reported consistently greater external tibial rotation in ACL-reconstructed knees (relative to the contralateral, uninjured knee), along with adequate restoration

of AP stability [3, 4, 9, 11]. These studies provide strong evidence that, under physiological loading, isolated ACL reconstruction effectively restores AP stability while actually overconstraining internal rotation. Thus, the motivation for adding an additional procedure to further constrain AP laxity and internal rotation is unclear.

While the goal of increasing joint stability may be admirable, there are potentially serious consequences for overconstraining the joint. The greatest concern is one that has yet to be addressed in any of the studies reviewed by Rezende and colleagues: The generation of increased (and potentially damaging) forces on cartilage. Adding a graft that is likely much stiffer than the capsular/ligamentous tissue it is meant to replace [7] disrupts the natural balance between ligaments and bony geometry, and may expose cartilage to abnormally high forces. This is especially concerning, given the multitude of studies that have identified osteoarthritis (OA) as an important clinical problem after ACL reconstruction [2, 6, 8, 10]. These studies reported little difference in

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rates of OA for surgically versus non-operatively treated ACL injuries, despite the well-documented laxity differences between these groups. Relationships between the presence of a positive pivot shift test and the likelihood of developing OA are also unclear at best [5]. These findings further challenge the logic of adding an additional procedure that has the primary goals of reducing static laxity and/or improving pivot shift results.

Based on these observations, there is a clear need for greater understanding of the biomechanical consequences of extraarticular augmentation with ACL reconstruction under in vivo, functional loading, and the possible impact of the procedure on cartilage loading and long-term joint health. Until such data are available, extraarticular augmentation should not be considered a “benign” procedure, since it may impart hidden risks that will only become apparent after long-term followup studies become available. Given this uncertain risk, and the lack of clear benefit identified from the meta-analysis by Rezende and colleagues, there appears to be little justification for routinely augmenting ACL reconstruction with extraarticular procedures, at least for knees without obvious, mechanically significant damage to lateral joint structures.

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