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CORR Insights®: No Clinically Important Difference in Knee Scores or Instability Between Transtibial and Inlay Techniques for PCL Reconstruction: A Systematic Review

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Where Are We Now?

Shin and colleagues performed a systematic review of Medline, Embase, and the Cochrane Library comparing outcomes of transtibial and inlay techniques for

posterior cruciate ligament (PCL) reconstruction and found no clinical difference between the two techniques. When looking at residual laxity, there were no differences in the two PCL reconstruction approaches. These observations support the finding of an earlier study by MacAllister and colleagues [12] who also demonstrated no difference in outcomes at 2 years between transtibial and open inlay techniques.

While it appears that the validated outcomes scores and stability between these two surgical approaches do not differ, Shin's systematic review highlights an important point; a considerable proportion of single-bun-

dle PCL reconstructed knee had Grade 2 or greater laxity regardless of surgical techniques.

The early biomechanical studies opposing PCL transtibial and inlay techniques have shown that the inlay technique was superior in restoring the posterior stability after PCL reconstruction [1, 12]. While these differences were observed in a cadaveric model, these results did not ultimately translate into superior clinical outcomes. There have since been numerous studies [2, 4, 5] aiming to define the surgical technique that best recreates native PCL biomechanics.

There is still no consensus on the ideal surgical approach, technique, or fixation method for operative PCL reconstruction. While the open surgical approach avoids the acute "killer turn" and enables anatomic placement, the large posterior incision is an obvious drawback [3]. The comparison between single-bundle and double-bundle PCL reconstruction has also been extensively studied [8, 10]. Previous biomechanical studies have

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shown superiority of double-bundle over single-bundle in improving stability [7, 9, 15]. Additionally, the use of allograft and autograft has also contributed to the heterogeneity of reconstruction techniques [9, 11]. While these different surgical techniques have been the subject of animated debate, the inlay, transtibial, single-bundle and double-bundle techniques have all had successful clinical outcomes.

Where Do We Need To Go?

The current treatment guidelines for PCL reconstruction are shaped around evidence originating from Level III studies. Therefore, Level I prospective trials examining objective stability and clinical outcomes should be our ultimate goal. Additionally, a better understanding of ideal tunnel placement, graft size, and type is paramount to determine the difference in treatment. While no surgical technique has enabled the restoration of native PCL biomechanics [13], anatomical individualized reconstruction surgery could be used to achieve this goal.

Recent studies [6, 14] in ACL surgery have aimed at customizing the treatment of ACL reconstruction based on each patient's individual bony and native ligament characteristics; this

approach aims to use individualized reconstruction surgery to restore the size and insertion of the native ligament. The anatomical individualized reconstruction concept could be used in the effort to recreate the native PCL biomechanics and improve knee stability.

How Do We Get There?

The heterogeneity in surgical approaches, graft choices, graft types, single-bundle versus double-bundle, and reconstruction techniques, encapsulate well the controversial status of operative treatment of PCL reconstruction. The best surgical treatment for PCL reconstruction will ideally arise from well-designed Level I studies incorporating objective evaluation of stability and appropriate clinical outcomes. Better-quality evidence of this sort should translate smoothly to everyday practice. We also need to further the understanding of how an individual's native bony and ligament characteristic should be taken into consideration in our treatment algorithms of cruciate ligament reconstruction. The current debate surrounding the ideal PCL reconstruction technique, and the resulting intellectual curiosity in restoring native biomechanical properties, is vital to advancing the treatment of PCL reconstruction.

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