

Meta-Analysis Comparing the Femoral Tunnel Length, Femoral Tunnel Position and Graft Bending Angle of Transtibial, Anteromedial and Outside-In Techniques for Single-Bundle Anterior Cruciate Ligament Reconstruction

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Abstract : This study aims to meta-analyse clinical studies comparing femoral tunnel position (FTP), femoral tunnel length (FTL) and graft bending angle (GBA) of single-bundle Anterior Cruciate Ligament (ACL) reconstruction using Transtibial (TT), Anteromedial (AM) and Outside-in (OI) techniques. A meta-analysis comparing the FTP, FTL and GBA of single-bundle ACL reconstruction utilising the TT, AM and OI was performed. Prospective Comparative Studies (PCS) and Retrospective Comparative Studies (RCS) from PubMed, Cochrane Library, and Embase were included. A total of 17 studies were included in this study. TT had the longest FTL, when compared to AM (Mean difference = 7.38, 95% CI: 3.76 to 11.00, $P < 0.001$) and OI (Mean difference = 9.47, 95% CI: 4.89 to 14.05, $P < 0.001$). In the deep-to-shallow direction, the OI resulted in a significantly deeper femoral tunnel as compared to the TT (Mean difference = 4.36, 95% CI: 1.39 to 7.33, $P = 0.004$) (Figure 6B). The AM technique also contributed to a significantly lower tunnel position as compared to the OI technique (Mean difference = 2.34, 95% CI: 0.76 to 3.92, $P = 0.004$). There were no significant differences in the graft bending angle between TT, AM and OI techniques. AM and OI techniques provide a more anatomical position as compared to the TT. Although FTL in the TT is longer than the AM and OI, all three techniques exceed the critical length of 25mm. There are no differences in the GBA between the three techniques.

Keywords : femoral tunnel position, femoral tunnel length, anterior cruciate ligament, transtibial, graft bending angle, anteromedial, outside-in

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