

# Accurate tibial tunnel position in transtibial pullout repair for medial meniscus posterior root tears delays the progression of medial joint space narrowing

## Abstract

**Purpose:** This study aimed to evaluate the association between the progression of medial joint space (MJS) narrowing, medial meniscus extrusion (MME), and clinical scores and the tibial tunnel position in pullout repairs for medial meniscus posterior root tears (MMPRTs).

**Methods:** This retrospective study examined 54 patients. Changes in MJS ( $\Delta$ MJS), MME ( $\Delta$ MME), and clinical scores and their relationship with the tibial tunnel position were evaluated using correlation coefficients. The distance from the anatomical to technical attachment position in the tibial tunnel position was measured in the anterior and medial directions, and the direct distance was measured using the Pythagorean theorem.

**Results:** The mean  $\Delta$ MJS and  $\Delta$ MME were  $0.6 \pm 0.8$  and  $1.3 \pm 1.3$  mm, respectively, and the mean anterior, medial, and direct distances were  $1.4 \pm 2.3$ ,  $2.2 \pm 1.7$ , and  $3.4 \pm 1.7$  mm, respectively.  $\Delta$ MJS had a significant positive correlation with the medial ( $r=0.580$ ,  $p<0.001$ ) and direct ( $r=0.559$ ,  $p<0.001$ ) distances, while  $\Delta$ MME had a significant positive correlation with direct distance ( $r=0.295$ ,  $p=0.030$ ). Several clinical scores were significantly negatively correlated with these distances.

**Conclusion:** In transtibial pullout repair for MMPRTs, accurate tibial tunnel position delayed the progression of MJS narrowing and MME, leading to improved clinical outcomes. The progression of MJS narrowing was associated with the mediolateral direction of the tibial tunnel position, while the clinical scores were associated with the anteroposterior direction of the tibial tunnel position. These findings indicate the need to orient the tip of the guide in a more posterolateral direction when creating the tibial tunnel.