Influence of Body Mass Index on Outcomes of Medial Meniscus Posterior Root Tear Repairs: A Comparative Cohort Study

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INTRODUCTION: Several investigations have examined prognostic factors for medial meniscal posterior root tear (MMPRT) repair, yet the effect of body mass index (BMI) on these outcomes remains inconsistent and has been directly addressed by only a few studies. This study aimed to evaluate the impact of BMI on outcomes following MMPRT repair, hypothesizing an inverse relationship between BMI and postoperative results.

METHODS: Patients who underwent primary isolated medial meniscus posterior root repair, were aged 18 or older, and had a minimum 2-year follow-up were included. Exclusion criteria consisted of patients undergoing revision medial meniscus posterior root repair, concomitant ligamentous repair or reconstruction, concomitant meniscus repair or meniscectomy, history of ipsilateral knee surgery, Kellgren-Lawrence (KL) grade >3, incomplete PROMs at baseline or minimum 2-year-follow-up, and lack of pre-operative posteroanterior (PA) flexed knee X-Ray and MRI. Data were collected on demographics, medical history, imaging, subsequent surgery rates, osteoarthritis progression, and patient-reported outcome measures (PROMs), including the Knee Injury and Osteoarthritis Outcome Score, Joint Replacement (KOOS Jr.), International Knee Documentation Committee (IKDC) score, and Veterans RAND 12 Item Health Survey Score (VR-12). Patients were categorized by BMI into three groups: Non-obese (< 30 kg/m²), Class-I Obesity (30–34.99 kg/m²), and Class-II Obesity and above (\geq 35 kg/m²). Continuous variables were analyzed using one-way ANOVA, and categorical variables were evaluated using the Chi-square test of independence, with significance set at p < 0.05.

RESULTS: A total of 85 patients (mean age 65.5 ± 7.4 years; 73% female) were included, with an average follow-up of 43.6 ± 18.8 months. The cohorts consisted of 31 non-obese patients, 23 Class-I Obesity patients, and 31 Class-II Obesity and above patients. The mean BMI was 26.55 ± 2.48 kg/m² for the non-obese group, 32.93 ± 1.0 kg/m² for the Class-I Obesity group, and 39.52 ± 3.41 kg/m² for the Class-II Obesity and above group (p < 0.001). Diabetes was more common in the Class-II Obesity group (25.80%) than in the non-obese (2.23%) and Class-I Obesity (13.04%) groups (p = 0.042). Tobacco use was highest in the non-obese group (38.71%), followed by Class-II Obesity (25.81%) and Class-I Obesity (21.74%) groups (p = 0.029). No significant differences were found in PROMs at baseline, follow-up, or in rates of achieving minimally clinically important differences, except for the achievement of patient acceptable symptomatic state for KOOS Jr., which decreased with higher BMI cohorts (70.1%, 60.9%, and 38.7%, p = 0.04). At final follow-up, all groups showed significant improvements in all PROMs, except for the Non-obese (p=0.716) and Class-I Obesity (p=0.099) groups for VR-12 Mental. Postoperatively, higher BMI was associated with more severe KL grade (p = 0.029) but no difference in joint space (p = 0.095). Subsequent surgery rates increased significantly with higher BMI (6.5%, 8.7%, and 16.1%, p = 0.009).

DISCUSSION AND CONCLUSION: Obese patients achieve comparable outcomes in terms of meaningful clinical improvement as their non-obese counterparts. However, individuals with a BMI \geq 35 kg/m² demonstrate significantly higher rates of subsequent surgery following arthroscopic MMPRT repair.