

Correlation Between MRI-Based Imaging Assessment Using MOCART 2.0 Knee Score And Clinical Outcomes After Autologous Chondrocyte Implantation

Taisei Suzuki¹, Tomoya Iseki², Shintaro Onishi², Takuya Iseki², Masaaki Onishi², Hiroshi Nakayama², Toshiya Tachibana²

¹Department of Orthopaedic Surgery, JCHO Kobe Central Hospital, Hyogo, Japan

²Hyogo Medical University, Hyogo, Japan

Disclosures:

Taisei Suzuki (N), Tomoya Iseki (N), Shintaro Onishi (N), Takuya Iseki (N), Masaaki Onishi (N), Hiroshi Nakayama (N), Toshiya Tachibana (N)

INTRODUCTION: The Magnetic Resonance Observation of Cartilage Repair Tissue (MOCART) 2.0 knee score is an MRI-based scoring system used to evaluate the structural quality of cartilage repair tissue. However, the relationship between MOCART 2.0 scores and clinical outcomes after autologous chondrocyte implantation (ACI, JACC®) remains unclear. This study aimed to investigate the correlation between MOCART 2.0 knee scores and clinical outcomes one year after surgery.

METHODS: We retrospectively analyzed 20 knees in 20 patients (12 men, 8 women; mean age, 58.1 ± 8.9 years) who underwent ACI (JACC®) for traumatic knee chondral lesions larger than 4 cm² between 2020 and 2023 and completed both MRI and clinical evaluations one year postoperatively. The total MOCART 2.0 knee score and its seven variables were assessed from postoperative MRI. Clinical outcomes included the Knee Injury and Osteoarthritis Outcome Score (KOOS), the International Knee Documentation Committee (IKDC) subjective score, and the Visual Analog Scale (VAS) for pain at rest and with activity. Correlations between MOCART scores and clinical outcomes were evaluated using Spearman's rank correlation coefficient, with statistical significance set at p < 0.05.

RESULTS: The total MOCART score showed significant positive correlations with KOOS (r = 0.516, p = 0.020) and IKDC (r = 0.506, p = 0.023), and significant negative correlations with VAS at rest (r = -0.562, p = 0.010) and during movement (r = -0.502, p = 0.024) (Fig.1). Among the seven variables, variable 2 (integration into adjacent cartilage) and variable 3 (surface of the repair tissue) showed significant positive correlations with KOOS (variable 2: r = 0.460, p = 0.041; variable 3: r = 0.455, p = 0.044) and IKDC (variable 2: r = 0.657, p = 0.0017; variable 3: r = 0.490, p = 0.028). For VAS at rest, variable 3 showed a significant negative correlation (r = -0.490, p = 0.028), and variable 2 had the next highest correlation but did not reach statistical significance (r = -0.431, p = 0.058). For VAS during movement, no significant correlations were observed. However, the two highest negative correlations were for variable 3 (r = -0.419, p = 0.066), followed by variable 2 (r = -0.390, p = 0.089).

DISCUSSION: These findings suggest the total MOCART 2.0 knee score one year after ACI reflects both functional outcomes and pain status, supporting its clinical utility as a postoperative assessment tool. In particular, variable 2 (integration into adjacent cartilage) and variable 3 (surface of the repair tissue) may hold greater clinical relevance, as they were associated with multiple outcome measures.

SIGNIFICANCE: In this study, the MOCART 2.0 knee score correlated with each clinical outcome measure, suggesting that it is a useful assessment tool reflecting clinical outcomes.

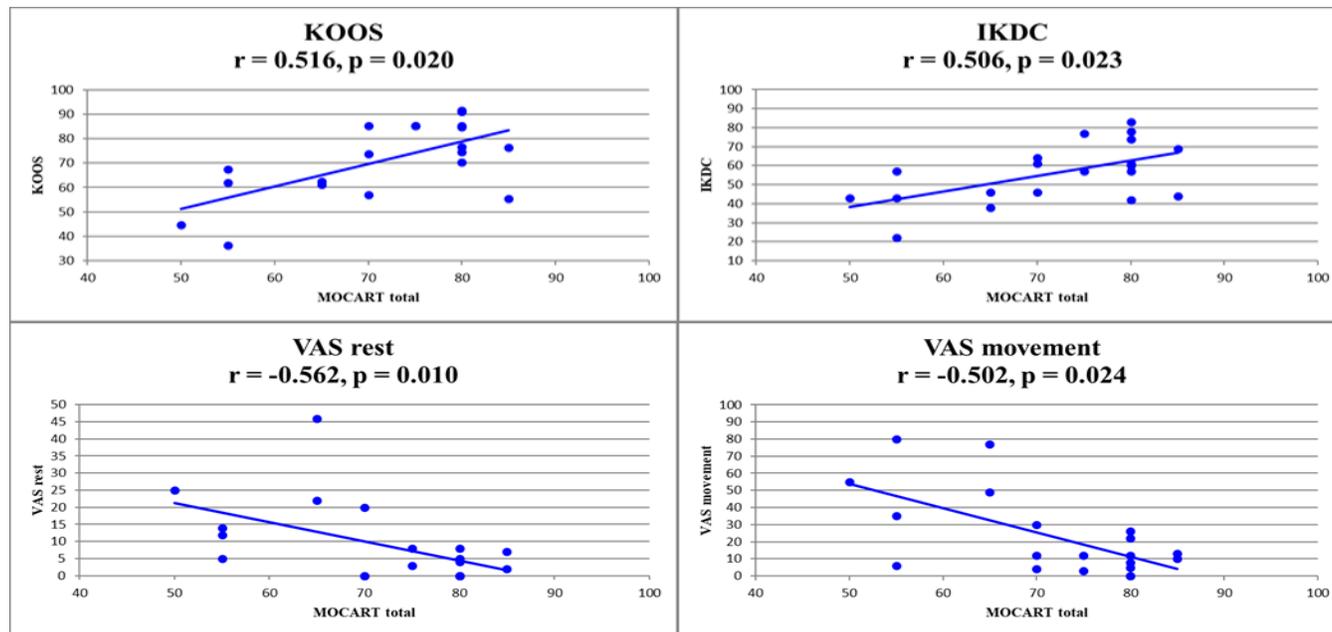


Figure 1. Correlations between the MOCART score and each clinical score.