## Relative Meniscal extrusion after meniscal allograft transplantation progressed during a longterm follow-up: Average 11 years follow-up longitudinal magnetic resonance imaging study

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INTRODUCTION: The long-term results of extrusion after meniscal allograft transplantation (MAT) are not completely understood.

This study aimed to analyze the change in meniscal extrusion using magnetic resonance imaging (MRI) after MAT through long-term follow-up. We hypothesized that meniscal extrusion would not progressed during the long-term follow-up.

METHODS: Patients who underwent MAT and were followed for at least 8 years were evaluated using MRI in both coronal and sagittal planes at 1 year, 4-6 years, and >8 years after MAT. Meniscal extrusion and entire meniscal widths in the coronal plane and anterior cartilage meniscal distance (ACMD) and posterior cartilage meniscal distance (PCMD) in the sagittal plane were measured, and relative values were calculated. The values in each plane were analyzed and complared at each time point. Clinical outcomes were evaluated using the Lysholm score.

RESULTS: Thirty-three cases were included with mean MRI follow-up period of 10.9 (range: 8-16.3) years. Mean absolute meniscal extrusion (coronal plane) with no significant difference in each time point (p=0.146). However, there was a difference in the relative value ( $0.27\pm0.03$  at 1 year;  $0.33\pm0.06$  at >8 years after MAT; p<0.001) due to entire meniscal width reduction (p<0.001). There was no difference in the mean absolute value of the ACMD in the sagittal plane (p=0.959). However, relative values were different ( $0.20\pm0.01$  at 1 year;  $0.25\pm0.04$  at >8 years; p<0.001) due to entire meniscal width reduction (p<0.001). There were no differences in absolute (p=0.175) and relative values (p=0.180) of the PCMD in each time point. The Lysholm score after surgery increased compared to that before surgery, there was no difference among the postoperative time points

DISCUSSION AND CONCLUSION: During long-term follow-up of extrusion after MAT using MRI, absolute extrusion was not changed in all plane. Relative extrusion in the coronal plane and relative extrusion of the ACMD in the sagittal plane significantly increased. However, there were no differences in the absolute and relative extrusions of the PCMD based on the time points. The Lysholm score after surgery increased compared to that before surgery, and it was maintained in long term follow-up.