

# Achievement of Minimal Clinically Important Difference in International Knee Documentation Committee Score After Arthroscopically Assisted Treatment of Knee Subchondral Bone Marrow Lesion is Significantly Affected by Body Mass Index and Varus/Valgus Angle

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## INTRODUCTION:

Knee subchondral bone marrow lesions (BMLs) are a known source of pain and risk factor for progressive degenerative changes and arthroplasty. Surgical treatment including lesion decompression and delivery of biomaterials can alleviate symptoms and delay need for arthroplasty; however, most approaches rely exclusively on fluoroscopic guidance and free-hand targeting. Outcomes of BML treatment with an arthroscopic referencing guide system have not yet been characterized. This study examines the association between multiple factors and achievement of minimal clinically important difference (MCID) in International Knee Documentation Committee (IKDC) score after arthroscopically guided treatment of knee subchondral BMLs.

**METHODS:** Consecutive patients with MRI-documented subchondral knee BML who underwent arthroscopically assisted treatment including decompression and biomaterial delivery with an arthroscopic referencing guide system (Fig. 1) from 08/2018 to 05/2023 were retrospectively reviewed and evaluated at a minimum of 2 years postoperatively. IKDC score was evaluated pre- and postoperatively, using the previously established value MCID = 14 for the surgical treatment of osteochondral pathology. Univariable logistic regression was performed for achievement of MCID as the outcome with the following factors: age, sex, body mass index (BMI), injury acuity, BML location (tibial vs femoral), degrees of varus or valgus alignment, preoperative IKDC score, Kellgren-Lawrence (KL) grade in the affected compartment, and meniscal pathology. Variables with  $P \leq .2$  in univariable analyses were included in a multivariable model.

**RESULTS:** 33 patients (mean  $\pm$  standard deviation [range] age,  $57.8 \pm 13.1$  [24–81] years; 12 [36.4%] male) were eligible for analysis. No variables were associated with MCID achievement in univariable analysis (Table 1). Age, BMI, injury acuity, and varus/valgus angle were included in the multivariable model. Multivariable regression analysis demonstrated that BMI was significantly negatively associated with MCID achievement, while varus/valgus angulation was significantly associated with a greater likelihood of achieving MCID (Table 2).

**DISCUSSION AND CONCLUSION:** Increasing BMI is a risk factor for not achieving MCID in IKDC score after arthroscopically guided knee subchondral BML treatment. Within the range of varus/valgus angulation included in the study, increased angles were associated with greater likelihood of MCID achievement.



Figure 1

Variable	Estimate	SE	OR	95% CI	P value
Age	-0.06	0.04	0.94	0.85-1.01	.158
Male sex	-0.35	0.87	0.71	0.13-4.24	.688
BMI	-0.15	0.10	0.86	0.69-1.03	.134
Acute injury	1.48	1.15	4.4	0.62-89.5	.198
Tibial location	-0.76	0.86	0.45	0.08-2.56	.380
Varus/valgus angulation	0.49	0.29	1.62	1.05-2.48	.098
Preoperative IKDC score	-0.02	0.03	0.98	0.92-1.05	.633
Kellgren-Lawrence grade	0.04	> .99	1.04	Undefined	> .999
Medial meniscus complex tear	-0.76	1.20	0.47	0.02-3.88	.528
Medial meniscus root tear	-1.67	1.40	0.19	0.01-2.66	.232
Lateral meniscus complex tear	-0.76	0.92	0.47	0.06-2.61	.410

Table 1

Variable	Estimate	SE	OR	95% CI	P value
Age	-0.08	0.09	0.92	0.74-1.09	.390
BMI	-0.58	0.27	0.56	0.27-0.84	.029
Acute injury	1.88	1.52	6.58	0.43-246	.215
Varus/valgus angulation	1.22	0.58	3.40	1.49-17.1	.098

Table 2