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Pre-Operative Femoral Cartilage Ultrasound Characteristics Are Altered in People Who Report Symptoms at 1 year After Anterior Cruciate Ligament Reconstruction

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Abstract

We assessed whether pre-operative femoral cartilage thickness and echo intensity on ultrasound are different between individuals who are symptomatic ($n = 6$) and asymptomatic ($n = 7$) at 1 year after a primary unilateral anterior cruciate ligament (ACL) reconstruction (age, 23 ± 4 y; 31% women, 69% men; body mass index, 24.9 ± 3.7 kg/m²). A pre-operative, bilateral ultrasound assessment was used to quantify average thickness and echo intensity in the medial, middle and lateral femoral trochlear regions. An inter-limb ratio (ACL/contralateral limb) was calculated for average thickness and echo intensity. At 1 y after ACL reconstruction, we operationally defined the presence of symptoms as scoring $\leq 85\%$ on at least two Knee Injury and Osteoarthritis Outcome Score subscales. Independent-sample t -tests and Cohen's d effect sizes were used to compare ultrasound pre-operative inter-limb ratios between participants with and without symptoms at 1 y after ACL reconstruction. For medial femoral cartilage, symptomatic participants had significantly greater average cartilage thickness inter-limb ratios ($p = 0.01$, $d = -1.65$) and significantly lower echo intensity inter-limb ratios ($p = 0.01$, $d = 1.72$) compared with asymptomatic participants. Middle and lateral femoral cartilage average thickness and echo intensity were not different between symptomatic and asymptomatic participants. These findings provide preliminary evidence that a clinically feasible ultrasound assessment of the femoral trochlear cartilage may be prognostic of self-reported symptoms at 1 y after ACL reconstruction.

Key Words

[Knee](#) • [Ultrasonography](#) • [Thickness](#) • [Echo intensity](#) • [Echogenicity](#) • [KOOS](#)

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