

Females Demonstrate Increased Knee Adduction Moments 5 years after ACLR

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Summary:

Females demonstrate greater knee adduction moments bilaterally when compared to males 5 years after ACL reconstruction, suggesting a sex-dependent progression of knee OA in these patients.

Abstract:

Introduction:

Long term health of the knee joint is a growing concern as the incidence of OA rises after anterior cruciate ligament (ACL) injury [1]. More than half of female athletes demonstrate radiographic knee OA 10 years after ACL injury [2]. The knee adduction moment has been used to describe the potential mechanism of the progression of knee OA [3, 4]. Increased knee adduction moments are present in females 1-2 years after ACL reconstruction (ACLR) [5, 6]. The purpose of this study is to evaluate the external knee adduction moment during gait for males and females in our preliminary 5 year follow-up after ACLR.

Methods:

Twenty-six subjects were included in this study (6 females, 20 males) that had an unilateral ACLR an average of 4.8 (± 0.8) years prior. All subjects participated in jumping, cutting and pivoting activities > 50 hrs/year at the time of their injury. Frontal plane biomechanical variables were collected for the external knee adduction moment at peak knee flexion during gait. Repeated measures ANOVA was used to determine differences between limbs and sex. A significance level of 0.05 was set a priori.

Results:

There was an effect of sex ($p=0.003$) for the knee adduction moment at peak knee flexion. There was no limb x sex interaction ($p=0.58$), but a trend towards a main effect of limb ($p=0.071$) for the knee adduction moment. Females demonstrated greater external knee adduction moments bilaterally (Involved= 0.28 Nm/kg*m; (95% CI: 0.22, 0.34); Uninvolved= 0.32 Nm/kg*m; (95% CI: 0.26, 0.38)) compared to males (Involved= 0.196 Nm/kg*m; (95% CI: 0.16, 0.23); Uninvolved= 0.22 Nm/kg*m; (95% CI: 0.19, 0.25)).

Discussion:

These preliminary data suggest that increased frontal plane moments are present in females 5 years after surgery. Increased knee adduction moments may be the mechanism associated with the progression of knee OA. The limited statistical significance is likely due to unequal groups and a limited number of female subjects.

Conclusion:

These data are consistent with published works of athletes after surgery, however our 5 year follow up is a novel approach. Continued collection of these data will allow us to better describe the knee joint health of these athletes long term. Further examination of clinical measures as well as radiographs may better explain these variances.

References:

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