Meniscal Ramp Lesions in Adolescent Patients Undergoing Primary Anterior Cruciate Ligament Reconstruction

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INTRODUCTION:

Meniscal ramp lesions describe a specific injury to the meniscocapsular junction at the posterior horn of the medial meniscus. The lesions are strongly associated with anterior cruciate ligament (ACL) injuries and may affect the biomechanical stability of the knee if left untreated. Despite the increasing rates of ACL reconstructions performed in adolescents each year, the prevalence and risk factors for ramp lesions in this patient population is poorly understood. We aim to determine the prevalence and risk factors for ramp lesions in children and adolescent patients undergoing primary ACL reconstruction.

METHODS:

All patients ≤19 who underwent primary ACL reconstruction at a single institution between 2019 and 2021 were included. All surgeries were performed by three fellowship trained orthopaedic surgeons. Patients were considered to have a ramp lesion if one was identified arthroscopically at the time of ACL reconstruction. Basic demographic data, preoperative imaging, and other arthroscopic findings at the time of ACL reconstruction were reviewed.

RESULTS:

A total of 247 consecutive patients who underwent ACL reconstruction were reviewed. Patients were excluded if they had had prior ACL injury, prior knee surgery, fibular hemimelia, or incomplete documentation. A total of 230 patients met inclusion criteria. Average age at time of injury was 15.7 years (range 4.0-18.2 years). A ramp lesion was identified in 12% of patients. Posteromedial tibial bone bruise on preoperative MRI and medial femoral chondromalacia at time of ACL reconstruction were associated with the presence of a ramp lesion, Figure 1A (OR = 2.6, 95% CI [1.15, 5.93]). A striation pattern of medial femoral chondromalacia was highly specific for the presence of a ramp lesion, Figure 1B (OR = 424.3, 95% CI [50.99, 3531.3]). Sensitivity and specificity for detecting a ramp lesion was 68% and 76% with preoperative MRI and 68% and 99.5% with medial condyle striations, respectively.

DISCUSSION AND CONCLUSION:

The prevalence of a ramp lesion in our cohort was 12%, mirroring historical reports in adult patients. Posteromedial bone bruising and medial femoral chondromalacia, especially in a striation pattern, should increase suspicion for the presence of a ramp lesion in patients undergoing ACL reconstruction.

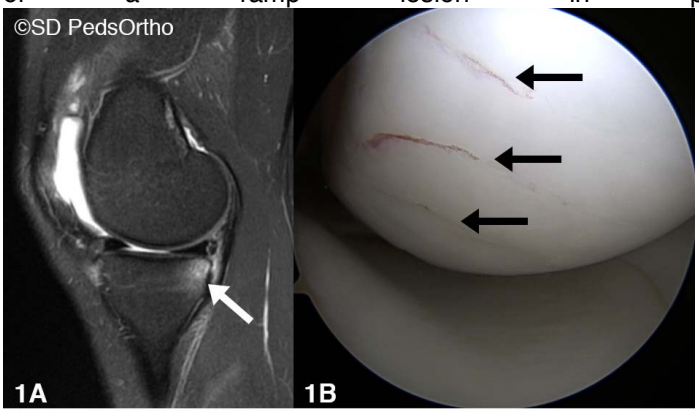

Figure 1. A) Sagittal T2 PD MRI with a ramp lesion of the medial meniscus and posteromedial tibia edema (arrow);
B) Arthroscopic image of the medial condyle and evidence of articular striations (arrows)