

Timing of Anterior Cruciate Ligament Reconstruction in Adolescents to Mitigate Secondary Meniscal or Chondral Pathology

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INTRODUCTION:

The aim of this study was to determine the incidence of secondary pathology in adolescent anterior cruciate ligament (ACL) deficient knees with respect to the time between injury and reconstruction to establish a 'safe' waiting time.

METHODS:

A total of 2,740 consecutive adolescents (aged 19 or less) underwent primary ACL reconstruction between January 1993 and April 2023 and were identified from a prospective longitudinal database of knee surgery. Prospective data collection included the time interval between injury and surgery, and meniscal injuries requiring surgical treatment. Secondary pathology was considered only for those requiring meniscectomy or repair, or with articular cartilage pathology. Articular cartilage abnormalities were graded according to the International Cartilage Repair Society system. Patients were classified in to 3 groups according to the interval between injury and surgery as follows: <5 months, 5-12 months, and 12 months or more.

RESULTS: In total, there were 1,626 (59%) male and 1,114 (41%) female patients, with a median age of 17 years (range 8 to 19 years). The median time to surgery was 2 months (range 1 week to 216 months). The majority of patients (81%) underwent reconstruction within 4 months of injury (n=2,208). The prevalence of any meniscal tear requiring treatment was 40% (n=1087). The incidence of medial meniscal tear requiring treatment was 14%, and lateral was 31%. The prevalence of articular cartilage damage was 10%. Overall, an increasing incidence of medial meniscal injury, and chondral damage occurred with increasing time interval. The odds of requiring medial meniscal surgery increased by a 1.6 after 4 months (p=0.005) and 4.2 after 12 months (p=0.001). The odds of chondral damage increased 3.2 times after 12 months. The prevalence of medial, lateral, and chondral injury was significantly higher in those age 14-19 compared to those age <14 years (p<0.003).

DISCUSSION AND CONCLUSION:

After 4 months from ACL injury there is a steady increase in the incidence of medial meniscal and chondral pathology in children and adolescents with ACL deficiency. If surgery is delayed for more than 12 months the odds of requiring medial meniscal surgery is increased by a factor of 4 and the odds of having a chondral lesion is increased by a factor of 3. In adolescents ACL reconstruction should be performed within 4 months of injury to mitigate the risk to meniscal and chondral structures.

