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BONY MORPHOLOGY: comparative anatomy and its importance for the ACL

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Abstract

Bone morphology is related to static and dynamic parameters during anterior cruciate ligament (ACL) kinematics and can affect injury mechanism patterns, gait analysis, biomechanical properties and surgical references for ligament reconstructions. It does not only depend on mechanical factors but reflects a developmental program with many other factor involved, including nutrition and hormones, especially those involved in the calcium metabolism. While Wolff's Law continues to be a dominant paradigm in Orthopaedics, in the past 15 years enormous advances have been made that have improved our understanding of how individual bones achieve their internal and external structure.

Transition from the quadrupedal mode of locomotion to bipedalism compelled changes in the femur morphology and the modern human knee has an extensive history of modifications produced by natural selection acting on its function in habitually upright walking and running. The human ACL is a band-like structure of dense connective tissues that binds the femur to the tibia. The femoral ACL attachment is located on the posterior aspect of the medial surface of the lateral femoral condyle and is composed of both direct and indirect fibers; the central part of the
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