The role of the tibial slope in sustaining and treating anterior cruciate ligament injuries.

Abstract:

A steep tibial slope may contribute to anterior cruciate ligament (ACL)-injuries, a higher degree of instability in the case of ACL insufficiency, and recurrent instability after ACL reconstruction. A better understanding of the significance of the tibial slope could improve the development of ACL injury screening and prevention programmes, might serve as a basis for individually adapted rehabilitation programmes after ACL reconstruction and could clarify the role of slope-decreasing osteotomies in the treatment of ACL insufficiency. This article summarizes and discusses the current published literature on these topics. A comprehensive review of the MEDLINE database was carried out to identify relevant articles using multiple different keywords (e.g. 'tibial slope', 'anterior cruciate ligament', 'osteotomy', and 'knee instability'). The reference lists of the reviewed articles were searched for additional relevant articles. In cadaveric studies, an artificially increased tibial slope produced an anterior shift of the tibia relative to the femur. While mathematical models additionally demonstrated increased strain in the ACL, cadaveric studies have not confirmed these findings. There is some evidence that a steep tibial slope represents a risk factor for non-contact ACL injuries. MRI-based studies indicate that a steep slope of the lateral tibial plateau might specifically be responsible for this injury mechanism. The influence of the...
tibial slope on outcomes after ACL reconstruction and the role of slope-decreasing osteotomies in the treatment of ACL insufficiency remain unclear. The role of the tibial slope in sustaining and treating ACL injuries is not well understood. Characterizing the tibial plateau surface with a single slope measurement represents an insufficient approximation of its three-dimensionality, and the biomechanical impact of the tibial slope likely is more complex than previously appreciated.IV.