

The nervous structures of anterior cruciate ligament of human knee, healthy and lesioned, studied with confocal scanning laser microscopy

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Key words: Anterior cruciate ligament, human knee, nervous structures, confocal laser scanning microscopy.

SUMMARY

The presence of nervous structures with proprioceptive function in the human knee ligaments is by now well known. Therefore a lesion of the anterior cruciate ligament (ACL), beyond a loss of mechanical stability, causes the interruption of proprioceptive signals. In the present study, the Authors verified the presence of nervous structures in lesioned ligaments, using bioptic samples taken from the distal portion of residual stumps of ACL, during surgical intervention of the ACL reconstruction. Their examination with conventional light microscopy, after silver impregnations and/or PGP 9.5 immunofluorescence, revealed that not all the nervous structures of injured ACL are completely lost after the trauma, but that some of them can maintain their morphology even many months far from the offending event. However most of them undergoes more or less marked alterations, as demonstrated the confocal laser scanning microscopy. The orthopaedic surgeons have to pay attention to the reconstruction of injured cruciate ligaments, even far from the injury, with different techniques which success may also depend on the number of lost proprioceptors, interrupted reflex circuits or non re-educated proprioceptive signals.

INTRODUCTION

Among the different structures that constitutes the knee, the anterior cruciate ligament (ACL) plays a fundamental biomechanical role as a central pivot. This role is linked to its position in the articulation (Dye and Cannon, 1988) and to the pres-