



Title	Tibial insertions of the anterior cruciate ligament and the anterior horn of the lateral meniscus: A histological and computed tomographic study
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論文審査の結果の要旨及び担当者

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論文審査の結果の要旨

前十字靱帯（以下ACL）はスポーツで損傷することが多く、保存治療では回復が見込めないため手術療法（ACL再建術）が広く行われている。脛骨及び大腿骨に骨孔を作成して移植腱を設置するACL再建を正確に行う為には、正常靱帯付着部の詳細情報が必須である。今研究は、ACL脛骨側付着部とその外側に付着する外側半月板前角（以下AHLM）の位置関係を組織学的評価及びCT画像評価を用いて詳細に検討したものである。今結果として、ACLとAHLMの間には明瞭な境界が存在し、それはCT上で確認できる事が分かっただけでなく、ACLはAHLMに沿ったL字状の付着形態を呈している事が分かった。今論文で明らかになった結果は、関節鏡手術時に有用であるだけでなく、術前及び術後の評価にも使用できる。よって本論文は学位の授与に値すると考えられる。

論文内容の要旨

Synopsis of Thesis

氏 名 Name	草野 雅司
論文題名 Title	Tibial insertions of the anterior cruciate ligament and the anterior horn of the lateral meniscus: A histological and computed tomographic study (前十字靱帯と外側半月板前角の脛骨付着部に関する組織学的及びCTでの検討)
<p>論文内容の要旨</p> <p>〔目的(Purpose)〕 The purpose of this study was to investigate the positional anatomic relationship between the anterior cruciate ligament (ACL) and the anterior horn of the lateral meniscus (AHLM) by histological evaluation of sequential slices and computed tomography (CT) of the tibial insertion sites for accurate tibial positioning in anatomical ACL reconstruction.</p> <p>〔方法 (Methods)〕 Twelve ACL-intact knees from embalmed cadavers were used in this study and randomly divided into two groups. Histological examination and CT assessed the anatomic and spatial relationship between the ACL and AHLM in the coronal plane in 6 knees (coronal group). They were sectioned into four slices for histologic examination in the coronal planes parallel to the AHLM alignment. Each of the four slices showed the insertion site of the ACL in relation to the position of the AHLM. The CT images corresponding to each histological slice were reconstructed and compared with the histological slices to assess bony surface morphology. The other 6 knees were only histologically evaluated in the sagittal plane (sagittal group). The length of each dense fiber insertion and the distance between identifiable bony landmarks were measured by using a slide caliper under a microscope. The distance between identifiable bony landmarks on reconstructed coronal images were also measured and compared with corresponding histological slices. In the sagittal plane, the presence of a bony prominence was confirmed adjacent to the anterior border of the ACL fibers. Based on characteristic bony landmarks, insertion length of each fiber from the histological data, the regions of the ACL insertion and AHLM insertion were delineated on the three-dimensional (3-D) reconstructed images.</p> <p>〔成績(Results)〕 The ACL fibers were broadly attached at the region immediately anterior to the AHLM with a width length of 10.2 ± 0.6 mm. Dense collagen fiber of the ACL and AHLM directly attached to the bony surface of the medial intercondylar ridge (MIR) slope and shared a clear border identifiable on the coronal CT images. The inclination of the bony surface changed at this border because the bony surface was slightly convex at the AHLM insertion site and concave at the ACL insertion site. The bony surface inclination change point corresponded to the ridge running anteroposteriorly adjacent to the concave area on the lateral side of an intercondylar area in the 3-D reconstructed CT image. No dense ACL fibers were attached to the region posterior to the AHLM. In the sagittal plane, the presence of a bony prominence was confirmed adjacent to the anterior border of the ACL fibers. Based on the histological data, the geometry of the ACL tibial insertion was surrounded by identifiable bony borders and was L-shaped along the AHLM, which was wide in the anterior insertion point and narrow in the posterior.</p> <p>〔総 括(Conclusion)〕 The present study revealed the precise insertion site of dense ACL fibers with reference to the position of the AHLM. These results suggest that the geometry of the ACL tibial insertion is L-shaped along the AHLM. Clinically, the position of the AHLM could be useful for accurate tibial tunnel positioning in anatomical ACL reconstruction. Specifically, the absence of firm attachment of the ACL in the region posterior to the AHLM on the tibial side is useful to avoid posterior tunnel placement.</p>	