

Characterization of the orientation and isometry of Humphrey's ligament

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OBJECTIVES/PURPOSE

The purpose of this study was to examine the effect of flexion angle on isometry and fiber obliquity of the anterior meniscomfemoral ligament (Humphrey's ligament (HL)).

METHODS

Following a medial parapatellar arthrotomy on 7 fresh frozen cadavers, the insertion points of the anterolateral (AL) and posteromedial (PM) bundles of the PCL, and HL were identified. Using a 9mm circular software tool, virtual fibers were created. Within each virtual graft, a central fiber was calculated and used to generate anisometry profiles for the AL and PM bundles and HL at flexion angles of 0°, 30°, 60°, 90°, and 120°. Previously validated computer navigation software was used to re-create three dimensional bundles to measure fiber obliquity in the sagittal, frontal, and axial planes.

RESULTS

HL length increased with knee flexion from 0 to 120°, and underwent similar length changes as the PCL bundles. In full extension and at 90°, the average length of the PM and AL bundles were not statistically different ($p=0.13$ and $p=0.85$ respectively). From 0 to 120°, the PM bundle was the most isometric, but the anisometry profile was statistically similar to the AL bundle and HL. In general, HL and the PM bundle had similar graphic trends in terms of fiber obliquity in all planes.

CONCLUSIONS

Using computer navigation, we have demonstrated that HL has similar isometry profiles as the PM and AL bundles of the PCL, and "mirrored" the obliquity of the PM bundle in all planes throughout flexion to 120°.

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