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Histological and ultrastructural analysis of the knee anterolateral ligament

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The Anatomy of the lateral aspect of the knee has been increasingly debated in recent literature, the morphology and function of anterolateral ligament (ALL) are not clearly understood even today (1, 2). The aim of present study was to provide for the first time a detailed ultrastructural characterization of the ALL and its ultrastructure collagen arrangement using the light microscopy (LM), the transmission electron microscopy (TEM) and variable pressure scanning electron microscopy (VP-SEM). Eight paired samples from four fresh-frozen males cadavers were used for the study. Samples were harvested from the ALL, from the anterolateral capsule and from the medial collateral ligament (MCL). All samples were treated for microscopy techniques. Histological analysis showed similar morphology features between ALL and MCL sectioning, but clear differences are evident in comparison to the knee capsule. At TEM the collagen fibers of ALL and MCL showed similarity in the ultrastructural morphology, both collagen fibers have parallel alignment mainly orientated longitudinally. Significant structural difference of the tissue of the fibrous capsule compared to the ligaments may be observed. The VP-SEM highlighted that ALL and MCL morphology has shown aligned arrangements of fiber bundles densely packed, completely different assembling organization of the fibers were observed in fibrous capsule. Data from this study demonstrate that the ALL and MCL have comparable ultrastructural properties. It can further lead us to speculate that the ALL is a ligamentous structure distinct from the knee capsule.

References

[1] Coquart et al. (2016) Anterolateral ligament of the knee: myth or reality? Surg Radiol Anat 38: 955-62.
[2] Claes et al. (2013) Anatomy of the anterolateral ligament of the knee. J Anat 223: 321-8.

Key words

Anterolateral ligament, Electron Microscopy, Ultrastructure.

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