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Morphometric Study of Human Anterior and Posterior Meniscofemoral Ligaments of the Knee Joint on Thiel Embalmed Cadavers

Authors : Mohammad Alobaidy, David Nicoll, Tracey Wilkinson

Abstract : Background: Many patients suffer postoperative knee stability after total knee arthroplasty (joint replacement) involving posterior cruciate ligament (PCL) sacrificing or retaining, but is not clear whether the meniscofemoral ligaments (MFLs) are retained during these procedures; their function in terms of knee stability is not well established in the literature. Purpose: Macroscopic, detailed, morphometric investigation of the anterior and posterior MFLs of the knee joint was undertaken to assist understanding of knee stability after total knee arthroplasty and ligament reconstruction. Methods: Dissection of eighty Thiel embalmed knees from 19 male and 21 female cadavers was conducted, mean age 77 (range 47-99 years). The origin and insertion of the anterior and posterior MFLs were measured using high accuracy, calibrated, digital Vernier calipers at 0.01mm. Results: The means were: anterior meniscofemoral ligament (aMFL) length 28.4 ± 2.7mm; posterior meniscofemoral ligament (pMFL) length 29 ± 3.7mm; aMFL femoral width 6.4 ± 1.7mm, mid-distance ligament width 4 ± 1.1mm, meniscal ligament width 3.9 ± 1.2mm; pMFL femoral width 5.6 ± 1.5mm, mid-distance ligament width 4.1 ± 1.1mm, meniscal ligament width 4.1 ± 1.3mm. Some of the male measurements were larger than female, with significant differences in the length of the aMFL femoral length $p<0.01$ and pMFL femoral length $p<0.007$, and width of the pMFL mid-distance $p<0.04$. Conclusion: This study may help explore the role of the meniscofemoral ligaments in knee stability after total knee arthroplasty with a posterior cruciate ligament retaining prosthesis. Anatomical information for Thiel embalmed knees may aid orthopaedic surgeons in ligament reconstruction.

Keywords : anterior and posterior meniscofemoral ligaments, morphometric analysis, Thiel embalmed knees, knee arthroplasty
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