

Publication

Measurement of knee joint gaps without bone resection: "physiologic" extension and flexion gaps in total knee arthroplasty are asymmetric and unequal and anterior and posterior cruciate ligament resections produce different gap changes

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Author(s) Nowakowski, Andrej Maria; Majewski, Martin; Müller-Gerbl, Magdalena; Valderrabano, Victor

Author(s) at UniBasel [Majewski, Martin](#) ; [Müller-Gerbl, Magdalena](#) ;

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General agreement is that flexion and extension gaps should be equal and symmetrical in total knee arthroplasty (TKA) procedures. However, comparisons using a standard TKA approach to normal knee joints that have not undergone bone resection are currently unavailable. Since bony preparation can influence capsule and ligament tension, our purpose was to perform measurements without this influence. Ten normal cadaveric knees were assessed using a standard medial parapatellar TKA approach with patellar subluxation. Gap measurements were carried out twice each alternating 100 and 200 N per compartment using a prototypical force-determining ligament balancer without the need for bony resection. Initial measurements were performed in extension, followed by 90° of flexion. The ACL was then resected, and finally the PCL was resected, and measurements were carried out in an analogous fashion. In general, the lateral compartment could be stretched further than the medial compartment, and the corresponding flexion gap values were significantly larger. ACL resection predominantly increased extension gaps, while PCL resection increased flexion gaps. Distraction force of 100 N per compartment appeared adequate; increasing to 200 N did not improve the results.

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