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Anterior laxity, graft-tunnel interaction and surgical design variations during anterior cruciate ligament reconstruction: A probabilistic simulation of the surgery

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Abstract:

Anterior Cruciate ligament (ACL) reconstructive surgeries, employing a total of 48 models, were conducted by virtually removing the ACL and then modeling the surgical preparation, tunnel architecture, graft pre-tensioning and fixation angle of a bone-patellar-tendon-bone autograft. Multifactorial sensitivity analyses were performed to assess the relative influence of these surgical factors on the intraoperative joint laxity, graft-tunnel contact mechanics and graft forces. The sensitivity results indicated that the combined variation in tunnel architecture and graft pre-tension at the time of fixation accounts for most of

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