Effects of Femoral Cam Design Variables on Degree of Flexion of Posterior Stabilized Knee Arthroplasty

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Abstract:
The posterior femoral translation during normal knee motion is provided by the posterior cruciate ligament. For many arthroplasty patients, cam and post mechanism in posterior stabilized knee implant provides the function of posterior cruciate ligament by recreating the femoral rollback mechanism, thereby providing a normal knee motion. This in turn provides increased knee flexion. However there are limitations in attaining the desired knee flexion due to the flaw in certain cam configurations. A study was thus conducted to determine the best configuration of the cam which can provide the best knee flexion in the PS knee arthroplasty. The high flex posterior stabilized knee implant model which included the femoral, tibial, and bearing components was developed using computer simulation software. Various combinations of cam sizes, location and varying sizes of posterior lip of tibial tray were examined. Results demonstrated that changes in the vertical distance and horizontal distance of the cam from the centre of the mid curvature of the femoral condyle influenced the flexion angle and the femoral rollback of the knee. However, changes in the diameter had no effect on the amount of knee flexion.

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