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A preliminary study of the kinematics of medial pivot knee arthroplasty in high-flexion

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Introduction: Medial pivot knee arthroplasty is known as prosthesis that has ball-contact joint on the medial side. Reduction number of radius from two to one on the femoral component might change the kinematics implant. Numerous studies have been done for low-flexion, and for high-flexion are still deficient. Two objectives upon this study; 1) how is the kinematics of medial pivot knee arthroplasty in high-flexion? (2) Does pivoting mechanism last until full flexion?

Method: Harnessing a 2/3 registration technique, two experiments had been conducted. Firstly empirical study, artificial bones and x-ray machine were used to capture five flexions ranged 100° to 140° with interval 10°. Secondly *in-vivo* study, nine subjects (3 male: 4 female) were selected to participate and were asked to lay-on-side on the interested leg for x-ray procedure.

Result & Conclusion: Empirical study finding shows the jig that holds the artificial bone influenced the kinematics of implant. Differently for *in-vivo* study, finding shows that the femoral component translated posteriorly on lateral side for about 15 mm from position 100° flexion. The pivoting mechanism on medial side was activated at 120° flexion and beyond. The kinematics of medial pivot knee arthroplasty shows a positive mimicry knee motion. Further study is needed for weight-bearing position.

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