

innovations

from The University of Vermont

TITLE: Knee Joint Prosthesis With a Femoral Component Which Links the Tibiofemoral Axis With the Patellofemoral Axis of Rotation

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SUMMARY: This invention is directed to a knee joint prosthesis that is configured to orient the coronal and rotational position of the tibia and the position of the patella relative to the femoral epicondylar (FE) axis of the femur after surgery. The design was based on testing cadaver specimens in a fixture designed to stimulate squatting. Electromagnetic sensors were positioned to measure the kinematics of the tibia, femur, and patella. After testing, the joint capsule was opened, and the articular surfaces of the femoral condyles were examined. The regions of the tibiofemoral contact were digitized, and the data points of each condyle were fit to a sphere. Using these techniques, an optimal FE axis can be developed.

ADVANTAGES: Two important factors need to be considered in total knee arthroplasty: a) the screw home mechanism does not necessarily occur after total knee arthroplasty because the geometry of most commercially available implants do not replicate that of the normal knee, and b) the screw home mechanism tends to move the patella laterally by externally rotating the tibial tubercle relative to the femur as the knee is extended. In applying the findings of this invention, one could ensure an implant that provides a rotational position that would more closely resemble what the normal knee experiences through a majority of the range of motions.

PATENT STATUS: Patent pending

LICENSING STATUS: World wide rights available

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