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*“The Effect of Sagittal Plane Resection during Total Knee Arthroplasty on RSA Migration of Tibial Baseplates”*

A successful knee replacement is highly dependent on the positioning of the implants that are placed by the surgeon after cutting away the bones that form the knee joint. Research on how and where the bone cuts are made has shown that the angles that they are cut at may make a difference in how well the new knee replacement functions. These functions include how much the knee is able to bend and straighten during activity such as walking. One of the lesser studied aspects is how the tibial slope angle (the tilt of the tibial plateau) effects implant function.

Previous research using computer modelling and cadavers has shown that making bone cuts, called resections, that change the angle of tibial slope during surgery has an effect on how the implant moves, possibly resulting in greater ability to straighten and bend the knee, called range of motion. Current surgical techniques make determining proper tibial alignment challenging because there are so many factors to consider at the time of surgery.

The purpose of this study is to determine the effect of the change in the tibial posterior angle from before and after surgery, measured using x-ray images, on how much the implant moves over time, up to two years after the total knee replacement. Implant movement is measured using a technology called radiostereometric analysis (RSA, for short). We hypothesize that changes in the tibial slope compared to pre-surgery, will result in greater movement of the tibial implant. Secondly, we believe that greater changes in the slope and movement may result in worse function and decreased patient reported outcomes, measured using questionnaires completed by the patient.