

The influence of the joint sutures on soft tissue balance in total knee arthroplasty

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Purpose: In Total Knee Arthroplasty, it is important to have good ligament balance in extension and flexion in order to get excellent results. However, the intraoperative joint balance is usually checked before sutures of the quadriceps femoris muscles, retinaculum, and joint capsule and may change after sutures. So in order to know balance change before and after sutures we examined balance in 20 degree flexion and 80 degree flexion before and after sutures over the navigation system.

Materials & Methods: The materials was 39 patients 40 joints in total with 34 women 35 joints, five 5 man 5 joints. The disease was 36 Oostoarthritis joints and Rheumatoid Arthritis 4 joints. Impalnt was the Low Contact Stress rotational platform (LCS, Johnson and Johnson, Depuy) and all implants was fixed with cement.

The age at operation is an average of 71 years old (52 ~82years).

Incision was medial parapatellar approach. After the skin incision and joint capsule was cut, the lateral and midial meniscus, anterior cruciate ligament and posterior cruciate ligament was removed. At extension, madial or lateral release was done to get appropriate ligament balance. After preparation the four screws to put the Tracker was inserted into the femur and the tibia and according to navigation system registration was done. First, the tibial surface cut was done as the navigation system ordered.

Second, after the flexoin gap with a spring spacer of 40 pounds was calculated using navigation system and, in reference to the external rotation angle of the femur using the preoperative CT was insertted to the navigation system. And so the navigation system ordered the bone was cut.After the femoral component and the tibial tray were fixed with cement and polyethylene insert was put, we manually stressed in valgus and varus direction in 20 degrees flexion and 80 degrees flexion before and after the suture of the capsule.

And then the medial and lateral joint gap over the navigation monitor was checked.

The medial and lateral joint gap and Varus imbalance (Lateral gap –Medial gap) was examined.

Results: Before the sutures, Varus imbalance under valgus stress in 20 degrees flexion was -2.3 ± 2.0 mm, under varus stress 5.7 ± 2.4 mm. After the sutures Varus imbalance under valgus stress in 20 degrees flexion was -2.2 ± 2.6 mm, under varus stress 5.3 ± 2.7 mm. Before the sutures, Varus imbalance under valgus stress in 80 degrees flexion was -2.5 ± 2.6 mm, under varus stress 2.9 ± 2.5 mm. After the sutures Varus imbalance under valgus stress in 80 degrees flexion was -2.2 ± 2.3 mm, under varus stress 2.6 ± 2.6 mm. The tendency to become tighter after the suture was recognized, but there were a little changes (the balance change under varus stress in 20 degrees flexion and under valgus stress in 80 degrees flexion were significant.)

Discussion: When ligament balance was checked in total knee arthroplasty, it is usually done before joint capsule sutures. It is unclear how ligament balance changes after the suture. Our results showed that the tendency to become tighter after the suture was recognized. However, there are a little changes, and so the balance check before the suture is thought to be clinically valid.