The Effect of Lateral Patellar Retinacular Release on Contact Stresses After Total Knee Arthroplasty with an Unresurfaced Patella

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Excessive pressure in the patellofemoral joint probably is an important cause of pain after total knee arthroplasty with an unresurfaced patella. Lateral patellar release often is recommended to treat the tilting or subluxing patella, but its effect on the normally tracking patella is not known. This study was designed to test the hypothesis that release of the lateral patellar retinaculum decreases patellofemoral pressure after total knee arthroplasty. A patella-friendly femoral component was used (Fig 1A). The AP axis was used for rotational alignment of the femoral component to place the patellar groove in its normal position (Fig 1B).

Methods

Seven normal cadaveric knee specimens were loaded in a knee-kinematics testing device and tested at 0°, 45°, and 90° flexion (Fig 2A). Contact area and compressive contact stresses between the patella and the anterior femur were measured with a digital electronic pressure sensor. Body weight and balancing quadriceps force were applied while patellofemoral pressure was measured with a digital electronic sensor (Fig 2B). Total knee arthroplasty was done without patellar resurfacing and contact area and stresses were measured. A limited lateral patellar retinacular release was done using an extracapsular prepatellar approach and the tests were repeated (Fig 3A). The lateral patellar release then was lengthened approximately 10 cm so that it extended into the vastus lateralis and distally to the tibia 1 cm lateral to the patella, quadriceps, and patellar tendon (Fig 3B). The tests were repeated again.
**Results**

Patellofemoral contact area decreased after TKA, but increased significantly ($p<0.05$), returning nearly to normal, after the lateral patellar retinaculum was released (Fig 4). Patellofemoral contact stress increased after TKA, and decreased significantly ($p<0.05$), returning nearly to normal, after the lateral patellar retinaculum was released (Figs 5,6). Contact area and contact stresses were not significantly different between the knees with partial or extended lateral patellar retinacular release in the normally aligned patellofemoral joint.

**Conclusions**

The results of this study suggest that limited lateral patellar retinacular release may improve patellofemoral function and durability even in a correctly tracking patella after TKA with an unresurfaced patella. No major benefit could be shown for extending the retinacular release in the normally aligned patellofemoral joint.