



Significance of Retaining Anatomic Patellar Ligament Length in Patellar Pole Avulsion Fractures and Injuries of Extensor Apparatus of the Knee

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Letter to the Editor

In 2004 and 2005 we had published two papers in JBJS regarding surgical technique and results of operative treatment of inferior pole avulsion fractures [1,2].

We compared results of reconstruction of avulsion fractures with osteosynthesis with basket plate (Group A), where in ten out of eleven patients, compared to three out of the thirteen patients with pole resection (Group B), had normal patellar height. The patellar heights in group A were distributed around normal value; the average height was 0.77 in Group A, compared with 0.56 in Group B. This difference was significant ($p=0.013$). The results also revealed that the patellofemoral score for patients with a normal patellar position was significantly higher than that for patients with patella baja. When the type of treatment was disregarded, the mean patellofemoral score was 81.9 points for all patients with patella baja and 94.7 points for all patients with normal patellar position ($p=0.008$).

We concluded that a possible explanation for the worse functional outcome for the patients who were managed with pole resection could be lower position of the patella, leading to shortening of the extensor mechanism. As a result of this shortening, compression forces in the patellofemoral joint increase, perhaps leading to cartilage damage. In contrast, retaining the inferior patellar pole preserves the functional length of the extensor mechanism and normal biomechanics of patellofemoral joint.

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Further studies of the ligamentous apparatus of the patellofemoral joint clarified the importance of the isometry (length with regard to position of ligament insertions) of the patello-tibial and patella-femoral ligaments for normal biomechanics, joint compression forces and for stability of the patella. The articular surface of the patella is multiplanar and adjusted to the shape of femoral condyles, so that compression forces are optimized during flexion/extension loading of the knee. If the length of patellar ligament is not restored after injury and we have either patella baja or patella alta, also the isometry of the patello-femoral and patello-tibial ligaments changes (become too short or too long in different position of the flexion of the knee) and change the tracking of the patella during motion, which leads to further incongruence of the articular surfaces during flexion and thus changed compression forces of the joint during loading.

Though further studies should be done in this field to clarify every aspect of the multicausal effect of different methods of reconstruction of the extensor apparatus of the knee after injury on the functional result, it seems that retaining the length of the patellar ligament is one of the most important factors for better long-term functional result.

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