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Patellofemoral Kinematics During Knee Flexion in Healthy Younger and Older Adults

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【Purpose】 Patellar maltracking is thought to be one source of patellofemoral pain. Pain typically arises during knee flexion activities, such as standing up and stair climbing. The purpose of this study was to investigate the patellofemoral kinematics during knee flexion in healthy younger and older adults.

【Methods】 Magnetic resonance images of the patellofemoral joints of 19 younger adult (mean age 21.4 ± 0.9 years) and 22 older adult (mean age 67.5 ± 8.2 years) healthy volunteers were acquired in supine position with 0° extension and 30° , 60° , and 90° flexion of the knee joint. The positions of patella on the femoral groove and the thickness of the prefemoral fat pad were measured from T1-weighted axial plane images. Medial/lateral translation of the patella was evaluated using the bisect offset index, reported as a percentage of the patella lateral to the midline of the femur.

【Results】 At 30° knee flexion, the patella translated more medially in all subjects. The patella demonstrated significantly more lateral translation at 0° extension and 90° knee flexion than at 30° flexion in all subjects. At 0° extension, the patella showed significantly more lateral translation in younger adults than in older ones ($p < 0.05$). The thickness of medial the prefemoral fat pad was significantly thicker in younger adults than in older ones.

【Discussion】 No kinematic differences between younger and older healthy adults were demonstrated in knee flexed positions. Because all older subjects are still working, they might have good knee function. However, decreased thickness of the prefemoral fat pad in older adults suggests that the patella does not have smooth movement during knee flexion. In order to clarify changes of knee joint related to pain, further study is needed regarding the knee of less active older subjects.