World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Femoropatellar Groove: An Anatomical Study

Authors : Mamatha Hosapatna, Anne D. Souza, Vrinda Hari Ankolekar, Antony Sylvan D. Souza

Abstract : Introduction: The lower extremity of the femur is characterized by an anterior groove in which patella is held during motion. This groove separates the two lips of the trochlea (medial and lateral), prolongation of the two condyles. In humans, the lateral trochlear lip is more developed than the medial one, creating an asymmetric groove that is also specific to the human body. Because of femoral obliquity, contraction of quadriceps leads to a lateral dislocation stress on the patella, and the more elevated lateral side of the patellar groove helps the patella stays in its correct place, acting as a wall against lateral dislocation. This specific shape fits an oblique femur. It is known that femoral obliquity is not genetically determined but comes with orthostatism and biped walking. Material and Methodology: To measure the various dimensions of the Femoropatellar groove (FPG) and femoral condyle using digital image analyser. 37 dried adult femora (22 right,15 left) were used for the study. End on images of the lower end of the femur was taken. Various dimensions of the Femoropatellar groove and FP angle were measured using image J software. Results were analyzed statistically. Results: Maximum of the altitude of medial condyle of the right femur is 4.98± 0.35 cm and of the left femur is 5.20±.16 cm. Maximum altitude of lateral condyle is 5.44±0.4 and 5.50±0.14 on the right and left side respectively. Medial length of the groove is 1.30±0.38 cm on the right side and on the left side is 1.88±0.16 cm. The lateral length of the groove on the right side is 1.900±.16 cm and left side is 1.88±0.16 cm. Femoropatellar angle is 136.38◦±2.59 on the right side and on the left side it is 142.38◦±7.0 Angle and dimensions of the femoropatellar groove on the medial and lateral sides were measured. Asymmetry in the patellar groove was observed. The lateral lip was found to be wider and bigger which correlated with the previous studies. An asymmetrical patellar groove with a protruding lateral side associated with an oblique femur is a specific mark of bipedal locomotion. Conclusion: Dimensions of FPG are important in maintaining the stability of patella and also in knee replacement surgeries. The implants used in to replace the patellofemoral compartment consist of a metal groove to fit on the femoral end and a plastic disc that attaches to the undersurface of the patella. The location and configuration of the patellofemoral groove of the distal femur are clinically significant in the mechanics and pathomechanics of the patellofemoral articulation.

Keywords : femoral patellar groove, femoro patellar angle, lateral condyle, medial condyle
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020