

The Location of the Popliteal Artery in Extension and 90 Degree of Knee Flexion Measured in MRI

Soonchunhyang University Hospital, Bucheon, Seoul National University Bundang Hospital

Jae Ho Yoo, M.D., Chong Bum Chang, M.D.

Introduction

We measured the location of the popliteal artery (PA) in extension and 90 degree of knee flexion by magnetic resonance images (MRI) to provide practical information to avoid PA injury.

Methods

Thirty knees of male subject were included in this study. The mean age of the subjects was 20.7. The MRIs were acquired in knee extension and 90 degree flexion. The measurement was conducted at 3 levels. At the level of joint line concerning arthroscopy, the PA was allocated with reference to lateral border of posterior cruciate ligament (PCL) mediolaterally, and to posterior capsule anteroposteriorly. At 1 cm to joint line concerning tibial plateau cut in knee arthroplasty, and at 2 cm to joint line concerning high tibial osteotomy, the distance between the posterior tibial cortex and PA was measured. The paired t-test was performed to analyze the effect of flexion on the dimension.

Results

At the joint line level, the PA was located lateral to the PCL 2.4 mm in extension and 3.2 mm in flexion ($p=0.247$), and 3.9 mm in extension and 7.6 mm in flexion from the posterior capsule ($p<0.001$). At 1 cm distal to the joint line, it is 2.7 mm in extension and 7.2 mm in flexion ($p<0.001$), and at 2 cm distal to the joint line, 4.9 mm in extension and 9.7 mm in flexion from the posterior tibial cortex ($p<0.001$). In sagittal plane, the nearest distance between PA and posterior tibial cortex was 1.8 mm in extension, and 6.2 mm in flexion ($p<0.001$).

Conclusion

The PA was located around 3 mm lateral to the PCL, and within 5mm in extension and 10 mm in 90 degree flexion of the knee behind knee joint. It moves farther posteriorly in 90 degree flexion than in extension of the knee. The conventional wisdom of flexing the knee to prevent the PA injury was supported by this study.

