

Paper #185

Positional Relationship between the Lateral Meniscus and the Popliteal Artery from the Lateral Infrapatellar Portal in All-Inside Lateral Meniscal Repair

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Summary:

The popliteal artery was found to be present at an average of 9.51 mm posterior to the posterior wall and 9.68 mm lateral to the posterior horn of the lateral meniscus. These aspects should be considered when performing the all-inside method for meniscus repairs near these regions.

Abstract:

Introduction

Repair of lateral meniscus(LM) using the all-inside technique via a lateral infrapatellar portal involves a risk of popliteal artery injury. This study aimed to determine the positional relationship between LM and a popliteal artery on magnetic resonance imaging (MRI) and investigate the safety zone from the posterior horn of LM simulating lateral meniscal repair using the all-inside device.

Materials And Methods

70 knees in 70 patients (37 men and 33 women) who underwent knee MRI from September 2016 to July 2017 were included in this study. The mean age was 39.2 years old ranging from 15 to 59. The indications for MRI were ligament injury in 18 knees, meniscus injury in 11, osteoarthritis in 6, fracture (no displacement of tibia plateau) in 5, patellar dislocation in 4, rheumatoid arthritis in 2, infection in 2 and investigation of knee pain in 22. The lateral infrapatellar portal was defined as the lateral border of patellar tendon on the axial plane, including the posterior horn of LM. On this plane, two lines were drawn from the lateral infrapatellar portal to the posterior horn of LM (line A) and the popliteal artery (line B). The most posterior point of posterior horn of LM(point A'), the point of intersection between line B and the posterior edge of LM(point B'), and the anterior edge of popliteal artery (point C') were dotted for the measurement. The angle between line A and B (angle AB), the distance between point A' and B', and between point B' and point C' were measured. The flexion angle of knee on MRI was defined as the angle between the distal axis of the femur and the proximal axis of the tibia on the sagittal plane. We investigated the association of the physical parameters(height, weight, and BMI) with the positional relationship between LM and popliteal artery to avoid a popliteal artery injury.

Results

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The average angle AB was 9.68° (2°–18°), and the average distance between point A' and point B' was 9.68 mm (2–15.4 mm). The average distance between point B' and point C' was 9.51 mm (4–18.4 mm). The average flexion angle of knee on MRI was 13.3° (-4°–26°). The average height, weight, and BMI was 164.7 cm (145–186 cm), 66.7 kg(40–128 kg), and 24.5 kg/m² (18.5–38.6 kg/m²), respectively. We did not find any association between these physical parameters and angle AB, the distance between point A' and point B', and between point B' and point C'.

Conclusions

This study showed that popliteal artery was found to be present at an average of 9.51 mm posterior to the posterior edge of LM and 9.68 mm lateral to the posterior horn of LM. This positional relationship should be considered when performing LM repair around this region using the all-inside method via the lateral infrapatellar portal.