

Diagnostic Accuracy of Medial Meniscus Posterior Horn Longitudinal Tear an Anterior Cruciate Ligament Deficient Knee with Different Arthroscopic Approaches

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Summary:

The posteromedial inspection using 70° arthroscope and exploration though posteromedial portal have improved the diagnostic accuracy of the lesions in MMPH, care should be taken to find the 'ramp legion' of MMPH when ACL reconstruction was performed.

Abstract:

Introduction

The meniscus was frequently injured during anterior cruciate ligament (ACL) injury, the prevalence was reported between 50-90% in ACL registries. The most common meniscal tear associated with ACL ruptures were the longitudinal tear of posterior horn of the medial meniscus (MMPH), which was called as 'ramp legion' This legion was hard to be recognized on arthroscopic diagnosis from anterior portals and preoperative magnetic resonance imaging (MRI) scans. Although several techniques have been introduced to find these ramp legions, there were little studies which were reported the prevalence of 'ramp legion' in every steps of systematic arthroscopic exploration. The purpose of this study is to report the diagnostic rate of 'ramp legion' using the arthroscopic exploration, and to suggest the diagnostic flows to find the 'ramp legion'.

Methods

Between June 2011 and April 2015, this is a prospective cohort study of 195 primary ACL reconstructions with systematic arthroscopic explorations for diagnosis of ramp legion. The confirmed diagnosis of ramp legion was defined as the peripheral tear (<4 mm from meniscocapsular junction) of MMPH. The patients who were performed meniscectomy previously or diagnosed with other ligament injury were excluded. The explorations of MMPH were performed in 4 steps with 30° and 70° arthroscope as follow : (1) standard exploration using probe through anterolateral portal (2) Exploration of posteromedial compartment through intercondylar space using 30° arthroscope (3) Exploration of posteromedial compartment through intercondylar space using 70° arthroscope (4) Exploration after creation of posteromedial portal. A x2 test was performed, and the statistical significance was set at $p < 0.05$. The positive and negative predictive values (PPV and NPV) were also calculated.

Results

The average age at the time of surgery was 40.5 ± 11.7 years. The mean time from injury to surgery was 9.3 ± 23.3 months. Of the total 195 patients, there were 50 patients (26.6%) who had ramp legion and repaired arthroscopically. Among the 50 patients who were confirmed as ramp legion, 8 cases were not found in preoperative MRI. The sensitivity and specificity of preoperative MRI were found as 84% and 95.2%. The PPV and NPV of MRI were found as 85.7% and 94.5%. After standard exploration by arthroscopy, as step 1, only 19 cases (38%) were found as ramp legion of MMPH. After step 2 procedure, additional 5 cases (10%) were found. Overall 24 cases (48%) were found as ramp legion of MMPH, therefor, the sensitivity and specificity of step 2 were found as 38% and 100%, revealed very low sensitivity. After step 3, additional 22 cases (44%) were found at last. No more additional cases of

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ramp lesion were found after step 4. There were statistically differences between step 2 and 3 ($p=0.001$), but no differences between step 1 and 2, step 3 and 4.

Conclusion

Many of ramp lesions could not be diagnosed by posteromedial inspection through intercondylar space using 30 arthroscope and standard anterior portals. Moreover, the sensitivity of MRI was found as 84%, the 'ramp lesion' could be easily missed during ACL reconstruction. The posteromedial inspection using 70° arthroscope and exploration through posteromedial portal have improved the diagnostic accuracy of the lesions in MMPH, care should be taken to find the 'ramp lesion' of MMPH when ACL reconstruction was performed.

Level of Evidence: Level I diagnostic study of consecutive patients