

A Rare Case Report: Triple PCL Sign - Simultaneous Bucket Handle Tear of Both Menisci with Chronic ACL Injury

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Abstract

Several types of meniscal tear could be presented in both acute and chronic anterior cruciate ligament injury. The incidence of bucket-handle meniscus tears can be up to 30% of the overall meniscus tears cases. The case of both compartment (medial and lateral) bucket-handle meniscus is rarely occurred. A case of both medial and lateral bucket-handle meniscus tears was reported in a male of 21 years old. The patient also had a chronic anterior cruciate ligament injury. The magnetic resonance imaging also showed a rare presentation of the triple-PCL sign with the sagittal view. Arthroscopic surgery with a meniscus repair and anterior cruciate ligament reconstruction was performed on the patient. Several specific imaging signs including triple-PCL sign could be presented in a rare case of both medial and lateral bucket-

handle meniscus tears. Recognition of this sign is important to have accurate preoperative diagnosis and proper treatment plan.

Keywords: Triple PCL Sign, Meniscus, ACL injury

Introduction

Meniscus tears occur in association with knee ligamentous injury such as anterior cruciate ligament (ACL)¹. Several types of meniscal tears are present in acute or chronic anterior cruciate ligament injury, which range from simple to complex bucket-handle tear^{1,2}. Bucket-handle tears occur when a vertical longitudinal tear in the meniscus displaced evenly into the respective medial or lateral compartment and causes symptoms such as pain, perceived instability, and mechanical locking³.

The incidence of bucket-handle meniscus tears is approximately 30% of the overall cases⁴. It can be

associated with or without cruciate ligament injury^{5,6}. Specific findings on magnetic resonance images such as the double- and triple-PCL sign, as well as triple- and quadruple-cruciate signs can be seen in these cases. In this paper, a simultaneous medial and lateral bucket-handle menisci tear associated with an anterior cruciate ligament injury and a rare triple-PCL sign on magnetic resonance imaging were reported.

Case Report

A 21 years old male presented to Ortho OPD with complaints of left knee pain for 1 year after he twisted his knee while playing badminton. The pain was severe on walking and flexing the knee. He also gave history of multiple occasions of catching and locking and walked without a walker. Physical examination revealed positive tenderness on the medial and lateral joint lines, which was also shown with the McMurray tests. The knee joint had difficulty obtaining full flexion due to pain at the posterior site, while stability tests revealed a positive Lachman, Pivot shift and anterior drawer. Plain knee radiograph showed no abnormality in the bone structure. Magnetic resonance imaging (MRI) revealed several signs of meniscus tears. The MRI showed signs of tears at the anterior and posterior horn of medial and lateral menisci that support the bucket-handle meniscus tears. Furthermore, the mid-sagittal section showed an absence of anterior cruciate ligament structure as well as the double and triple-PCL signs. The coronal view also showed the displaced medial and lateral meniscus together with the normal PCL and absence of ACL structure with the triple-cruciate sign. The patient had an arthroscopic surgery after being informed and was positioned supine under spinal anesthesia and tourniquet with knee joint on the table. The arthroscopy procedure was performed with standard anterolateral, anteromedial

and medial parapatellar portals. During the first view of arthroscopy diagnostic, it was shown that the displaced medial and lateral meniscus bucket-handle tear together with the tibial site anterior cruciate ligament remnant, while no cartilage tear was encountered. Furthermore, the reposition of the medial and lateral meniscus, as well as repairs, were performed, while the anterior cruciate ligament reconstruction was carried out with the use of a 9 mm Ipsilateral autologous semi-tendinous and gracialis graft. Graft fixation was performed with an Endo button at the femoral end and with bioabsorbable interference screw at the tibial end of the tunnel.

PRE-OP



Fig. 1: Sagittal section of T1 weighted MRI left knee showing Triple PCL Sign



Fig. 2: Coronal section showing the Bucket handle tears of the menisci.

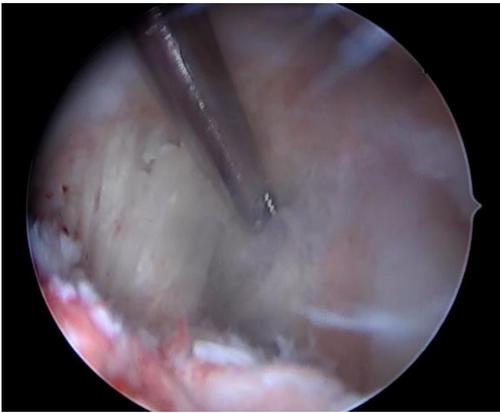


Fig. 3: Arthroscopic image showing torn ACL.



Fig. 4A: Arthroscopic image showing Bucket handle tear.

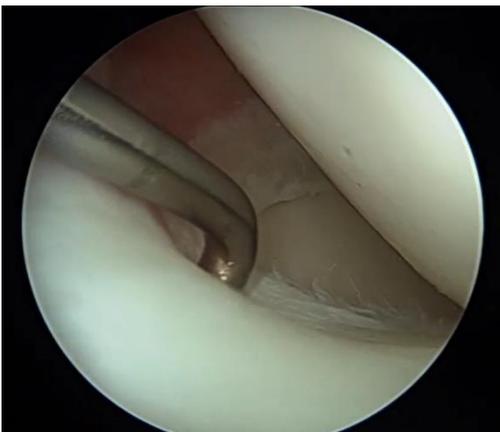


Fig. 4B: Arthroscopic image showing Bucket handle tear.

POST-OP



Fig. 2: Xray Right knee AP and Lateral views showing Endo button used for fixing the ACL graft at the femoral end.

Discussion

Mostly both compartment bucket-handle meniscus tears cases that have been reported are in association with an ACL injury^{6,7}, however, it also occurred in an intact anterior cruciate ligament in some cases⁵. The bucket-handle meniscus tears were associated with a chronic ACL injury, and the patient also had a history of knee injury 1 year ago. An initial MRI examination was not performed. Therefore, it could not be determined whether the meniscus tears occurred at the initial knee injury or involving a chronic process. In previous studies, several signs were presented on MRI of the knee in a case of both compartment bucket-handle meniscus tears. The classic double-PCL sign was most commonly presented in the previous studies⁵. The triple-PCL sign was a rare presentation in this particular case. To the best of our knowledge, it has only reported in three previous cases⁷. The triple-PCL sign was first reported in 2010 by Kakel et al⁸ on a 16 years old male knee MRI that had both compartment bucket-handle meniscus tears with the acute ACL injury. The triple-PCL sign will show when there

was an overlapped medial and lateral meniscus bucket-handle tears in the intercondylar notch. Several specific imaging signs including triple-PCL sign are seen in a rare case of both medial and lateral bucket-handle meniscus tears. Recognition of this sign is important to have accurate preoperative diagnosis and proper treatment plan.

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