TUSYAD STArt Sports Traumatology & Arthroscopy

DOI: 10.14744/start.2025.68540
Sports Traumatol Arthrosc 2025;2(3):128–133

Case Report

Concurrent Medial Ramp and Lateral Zip Lesions in ACL-Deficient Knees: A Rare Case Report Highlighting Diagnostic and Surgical Challenges

Mehmet Ali Sabir, Selahaddin Aydemir, Riza Berker Ozbek

Department of Orthopaedics and Traumatology, Kastamonu Research and Training Hospital, Kastamonu, Türkiye

ABSTRACT

Anterior cruciate ligament (ACL) injuries are often seen in conjunction with meniscus tears; some of these tears are critical for knee stability, although they can make diagnosis difficult. Ramp lesions of the medial meniscus and zip lesions of the lateral meniscus are examples of this type of injury that require careful arthroscopic evaluation. A 27-year-old male patient presented with pain and instability in his right knee following an injury sustained during football one year prior. Magnetic resonance imaging revealed an ACL tear and a suspected tear in the medial meniscus; however, the lateral meniscus lesion could not be clearly defined preoperatively.

During arthroscopy, the ACL tear, ramp lesion in the medial meniscus, and zip lesion in the lateral meniscus were confirmed. ACL reconstruction was performed using a hamstring autograft. The ramp lesion was repaired with all-inside sutures. A partial meniscectomy was performed on the peripheral zip lesion, and an all-inside repair was applied to the menisco-capsular tear. Ramp and zip lesions are difficult to diagnose both before and during surgery and they may coexist. Adequate repair of these lesions is integral for long-term results, thus the surgeon should approach these lesions carefully and patiently.

Keywords: Knee ınstability, lateral meniscus zip lesion, meniscocapsular tear, meniscal ramp lesion

Cite this article as:
Sabir MA, Aydemir S, Ozbek RB. Concurrent Medial Ramp and Lateral Zip Lesions in ACL-Deficient Knees: A Rare Case Report Highlighting Diagnostic and Surgical Challenges. Sports Traumatol Arthrosc 2025;2(3):128–133.

Address for correspondence:
Selahaddin Aydemir.
Department of Orthopaedics and Traumatology, Kastamonu Research and Training Hospital, Kastamonu, Türkiye
E-mail:
selahaddinaydemir@gmail.com

Submitted: 13.04.2025
Revised: 30.05.2025
Accepted: 05.06.2025
Available Online: 22.12.2025

Sports Traumatology & Arthroscopy – Available online at www.stajournal.com

INTRODUCTION

Anterior cruciate ligament (ACL) tears are one of the most common sports-related knee injuries and meniscal damage, which often accompanies ACL injuries, has an important place in clinical practice. [1,2,3] Meniscal tears commonly associated with ACL injuries include bucket handle tears, ramp lesions, lateral meniscal posterior root tears (LMPRTs) and lateral meniscal oblique radial tears (LMORTs), some of which are difficult to diagnose and may contribute to knee instability. Several treatment options are available, including meniscal repair, meniscectomy, leave-in-place or meniscal allotransplantation.

Meniscal tears in the presence of ACL injury can affect postoperative functional outcomes and stability if not treated properly. Medial meniscal ramp lesions, which are characterised by tears at the meniscocapsular junction of the posterior horn, are often underdiagnosed but are critical for maintaining knee stability, especially in situations involving rotational instability.[4] Zip lesions (Wrisberg tear, zip tear) are longitudinal vertical/oblique meniscal tears at the junction of the Wrisberg ligament and the posterior horn of the lateral meniscus.[5] Zip lesion has been reported as the equivalent of medial sided ramp lesion.[5] Failure to diagnose or inadequate repair of the posterior lateral

meniscal zip lesion may cause instability and ACL graft failure thereafter.[6]

These combined injuries pose a significant challenge in diagnosis and treatment due to their subtle clinical presentation and complex biomechanical effects. Since untreated meniscal injuries may jeopardise the long-term outcome of ACL surgery, proper identification and treatment of these lesions during anterior cruciate ligament reconstruction (ACLR) is essential to restore knee stability and function. We report a rare case of ACL rupture with both a medial meniscal ramp lesion and a lateral meniscal zip lesion.

CASE REPORT

A 27-year-old male patient presented to our clinic in August 2023 with complaints of right knee pain and instability for one year after a rotational injury during a football match. On physical examination, tenderness was noted in both the lateral and medial joint lines of the right knee. Knee stability tests including anterior drawer, Lachman and pivot shift tests were positive. Medial and lateral McMurray tests were also positive. Plain radiographs showed no bone pathology, while magnetic resonance imaging (MRI) showed femoral avulsion of the ACL. In addition, a longitudinal tear of the posterior horn of the medial meniscus and a suspicious tear of the posterior horn of the lateral

Figure 1. (a) Sagittal T2-weighted MRI showing a longitudinal tear in the posterior horn of the medial meniscus (white arrow) consistent with a ramp lesion. **(b)** Sagittal T2-weighted MRI showing a suspicious tear in the posterior horn of the lateral meniscus (white arrow) suggestive of a possible zipper lesion.

meniscus were observed (Fig. 1). The preoperative diagnosis of the lateral meniscal tear could not be definitively established.

Surgical Management

Following informed consent, arthroscopic surgery was performed under spinal anaesthesia in the supine position using a tourniquet. Intraoperative arthroscopic evaluation revealed a longitudinal tear (ramp lesion) [7] in the meniscocapsular region of the posterior medial meniscus and two longitudinal tears (zip lesions) [8] in the meniscocapsular region and periphery of the posterior lateral meniscus (Fig. 2).

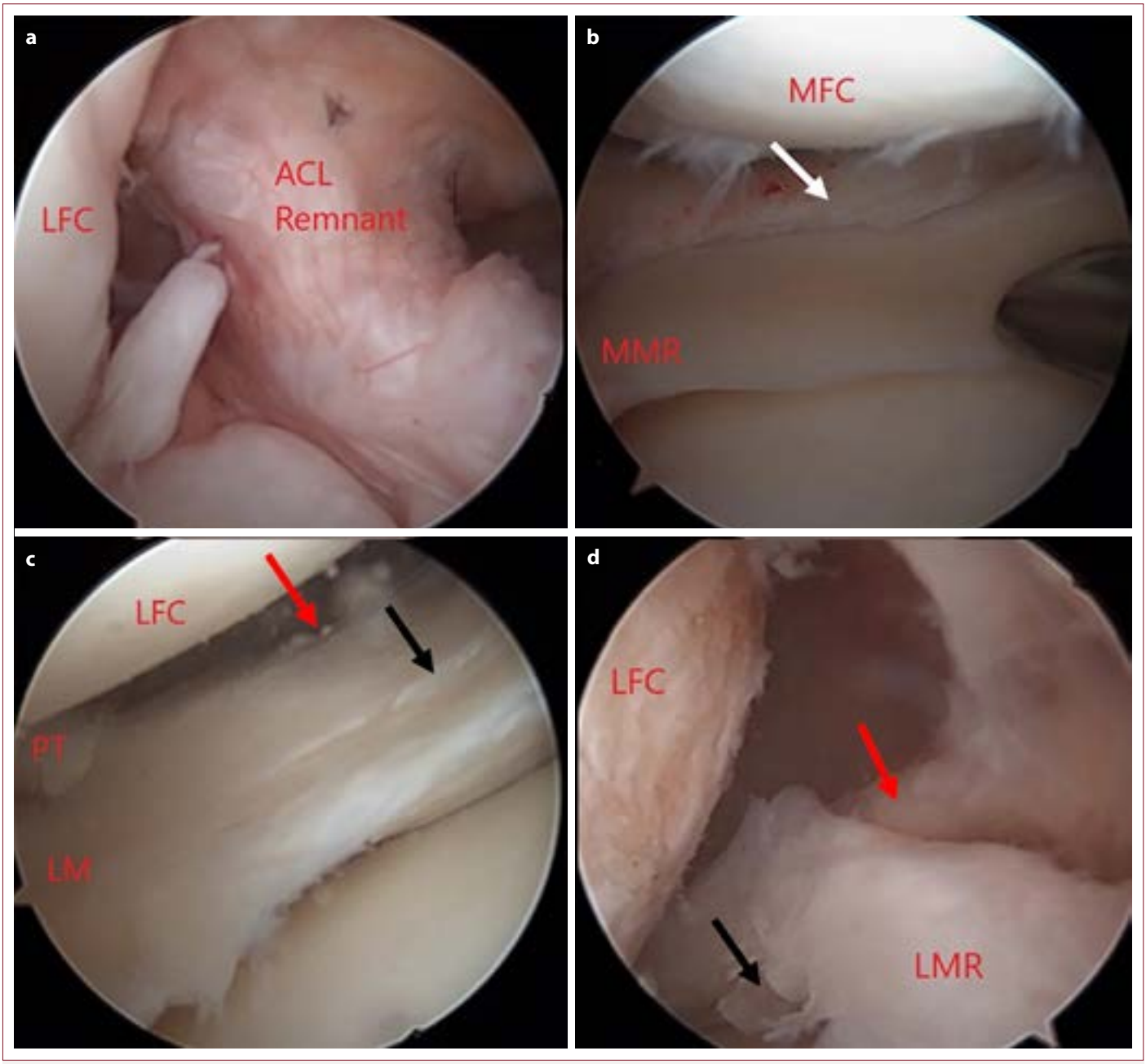

Figure 2. (a): Ruptured anterior cruciate ligament. **(b)**: Arthroscopic view showing a longitudinal tear (ramp lesion) in the meniscocapsular region of the posterior medial meniscus (white arrow). **(c)**: Lateral portal view of two longitudinal tears (zip lesions) of the posterior lateral meniscus in and around the meniscocapsular region. The proximal tear is indicated by the red arrow and the peripheral tear by the black arrow. **(d)**: Medial portal view of the zip lesion.

We performed all inside ACLR using hamstring autograft. For the ramp lesion, all-inside meniscal sutures were used for fixation. For the zip lesion, a partial meniscectomy was performed on the peripheral tear and the meniscocapsular tear was repaired using all-inside meniscal sutures (Fig. 3).

Postoperative Rehabilitation

The rehabilitation programme focused on progressive weight-bearing and strengthening exercises. Early weight bearing was started cautiously, followed by gradual strengthening of the knee musculature to restore functionality.

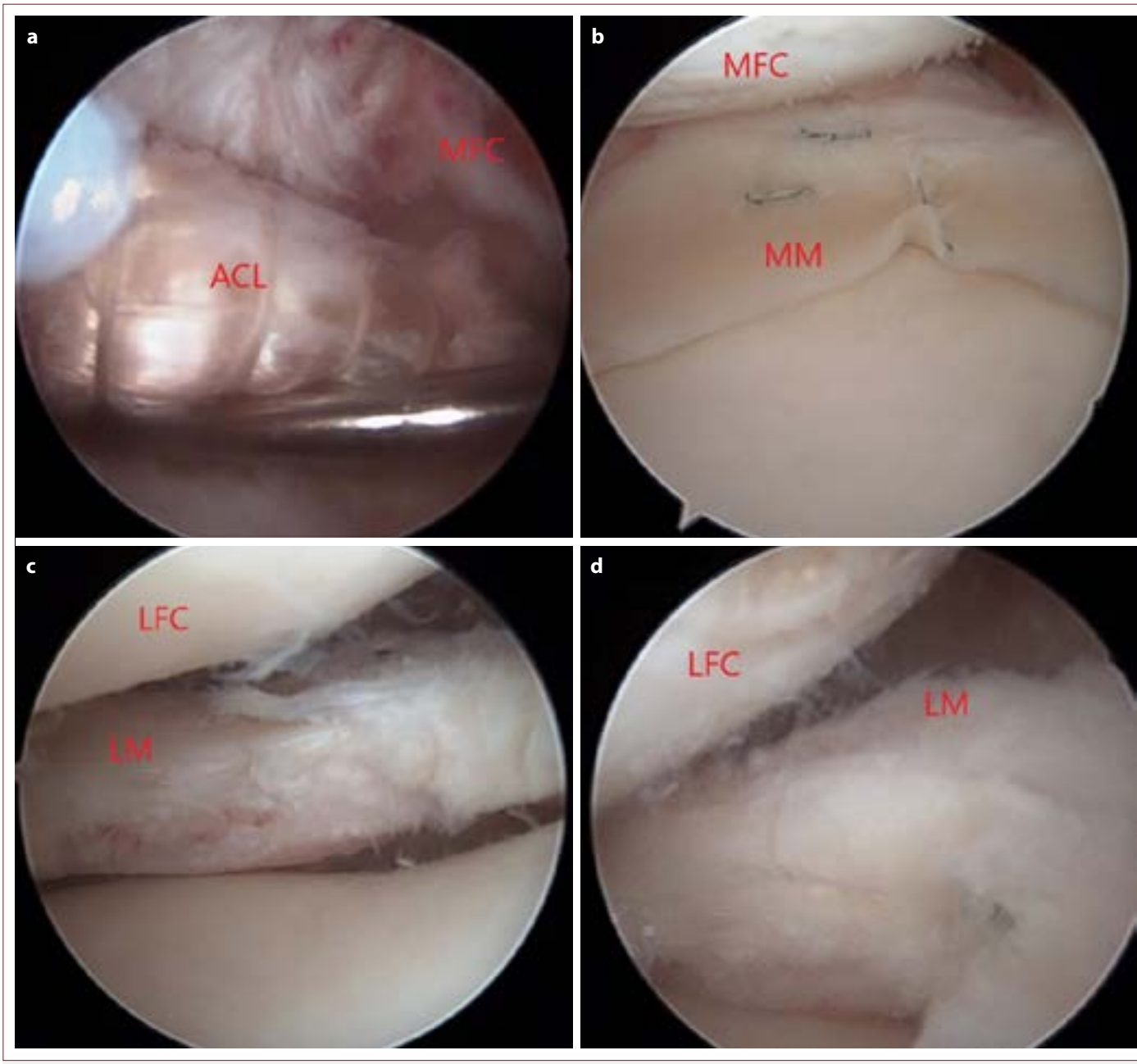

Figure 3. (a): Reconstruction of the anterior cruciate ligament ACL with hamstring autograft using a all inside technique. **(b)**: Repair of the medial meniscal ramp lesion with all inside sutures. **(c)**: View of the peripheral tear of the lateral meniscus after meniscectomy. **(d)**: All inside suture repair of the central tear of the lateral meniscus.

DISCUSSION

This case highlights the importance of comprehensive arthroscopic evaluation in ACL-deficient knees, as concomitant meniscal lesions significantly affect stability and outcomes. Ramp and zip lesions, although difficult to detect preoperatively, should be carefully addressed to optimise the success of ACLR.

Meniscal ramp lesions are increasingly recognised as an important comorbidity in ACL injuries, with reported prevalence rates ranging from 9.3% to 42% among ACLR patients.[9,11] Despite their clinical importance, these lesions are often underdiagnosed preoperatively and are missed up to 50% of the time (cases) on MRI scans.[9] Posteromedial tibial bone bruising has emerged as a useful indirect indicator to suspect ramp lesions in such cases, as studies report that up to 72% of ACLR patients with this MRI finding exhibit ramp lesions during arthroscopy.[9] Ramp lesions are particularly difficult to identify and repair during standard arthroscopic evaluations due to limited visualisation of the posterior horn and medial meniscocapsular junction through the anterior portals.[12] This limitation often results in inadequate assessment and surgical repair, potentially compromising the stability and long-term outcome of ACLR. The necessity of advanced arthroscopic posteromedial exploration to detect and repair these lesions cannot be overstated.

Similar to ramp lesions, zip lesions are difficult meniscal injuries to diagnose.[8] Clinical examination of the knee and MRI have limited accuracy in detecting these lesions.[8,13] These diagnostic difficulties and limited data in the literature lead to uncertainties regarding the classification and management of zip lesions. Therefore, a systematic evaluation of the posterolateral region is important during ACLR. It has been reported that detailed examination of the meniscal surfaces during arthroscopy and use of the anteromedial portal may increase surgical success by enabling the recognition and appropriate treatment of zip lesions.[8]

Untreated ramp lesions may lead to residual anteroposterior laxity [5], while zip lesions contribute to rotational instability [6] and they can both jeopardise ACLR results.

CONCLUSION

Ramp and zip lesions are difficult to diagnose both before and during surgery and they may coexist. Adequate repair of these lesions are integral for long term results thus the surgeon should approach these lesions carefully and patiently.

DECLARATIONS

Ethics Committee Approval: This is a case report, and therefore ethics committee approval was not required in accordance with institutional policies.

Informed Consent: Participants provided informed consent for inclusion.

Conflict of Interest: The authors declared no conflict of interest.

Financial Disclosure: The authors declared that they have no relevant or material financial interests that relate to the research described in this paper.

Data Avaliability Statement: Data are available from the corresponding author upon reasonable request.

Use of AI for Writing Assistance: The authors declared that they did not use any generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

Author Contributions: Idea/Concept – MAS, SA; Design – MAS, SA; Control/Supervision – MAS, SA, RBO; Data Collection and/or Processing – MAS, SA; Analysis and/or Interpretation – MAS, RBO; Literature Review – SA, MAS; Writing – SA, RBO; Critical Review – MAS; References and fundings – MAS, SA; Materials – MAS, SA.

Peer-review: Externally peer-reviewed.

REFERENCES

1. Siegel L, Vandenakker-Albanese C, Siegel D.Anterior cruciate ligament injuries: anatomy, physiology, biomechanics, and management. Clinical journal of sport medicine: official journal of the Canadian Academy of Sport Medicine 2012;22:349-55. [Crossref]
2. Ahldén M, Samuelsson K, Sernert N, Forssblad M, Karlsson J, Kartus, J. The Swedish National Anterior Cruciate Ligament Register: a report on baseline variables and outcomes of surgery for almost 18,000 patients. Am J Sports Med 2012;40: 2230-5. [Crossref]
3. Krych AJ, LaPrade MD, Cook CS, Leland D, Keyt LK, Stuart MJ, et al. Lateral Meniscal Oblique Radial Tears Are Common With ACL Injury: A Classification System Based on Arthroscopic Tear Patterns in 600 Consecutive Patients. Orthop J Sports Med 2020;8:2325967120921737. [Crossref]
4. Koji N, Konstantinou E, Maximiliane Wackerle A, Lagreca JC, Grandberg, Park YL, et al. Meniscus tears in the setting of anterior cruciate ligament injury. J Joint Surg Res 2024;2:180-8. [Crossref]
5. Kunze KN, Wright-Chisem J, Polce EM, DePhillipo NN, LaPrade RF, Chahla JRisk Factors for Ramp Lesions of the Medial Meniscus: A Systematic Review and Meta-analysis. T Am J Sports Med 2021;49:3749-57. [Crossref]
6. Tamimi I, Enrique DB, Alaqueel M, Tat J, Lara AP, Schupbach J, Burman M, Martineau P. Lateral Meniscus Height and ACL Reconstruction Failure: A Nested Case-Control Study. J Knee Surg 2022;35:1138-46. [Crossref]
7. Taneja AK, Miranda FC, Rosemberg LA, Santos DCB.

Meniscal ramp lesions: an illustrated review. Insights Imaging 2021;12:134. [Crossref]

8. Gupta S, Dwivedi A, Chavan SK, Gupta P. Lateral Meniscus Zip Lesion of Knee: Classification and Repair Methods. Arthrosc Tech 2024;13:102911. [Crossref]
9. DePhillipo NN, Cinque ME, Chahla J, Geeslin AG, Engebretsen L, LaPrade RF. (2017). Incidence and Detection of Meniscal Ramp Lesions on Magnetic Resonance Imaging in Patients With Anterior Cruciate Ligament Reconstruction. Am J Sports Med 2017;45: 2233-7. [Crossref]
10. Balazs GC, Greditzer HG 4th, Wang D, Marom N, Potter HG, Marx RG, et al. Ramp Lesions of the Medial Meniscus in Patients Undergoing Primary and Revision ACL Reconstruction: Prevalence and Risk Factors. Orthop J Sports Med 2019;7:2325967119843509. [Crossref]
11. Bollen SR. Posteromedial meniscocapsular injury associated with rupture of the anterior cruciate ligament: a previously unrecognised association. J Bone Joint Surg Br 2010;92: 222-3. [Crossref]
12. Greif DN, Baraga MG, Rizzo MG, Mohile NV, Silva FD, Fox T, et al. MRI appearance of the different meniscal ramp lesion types, with clinical and arthroscopic correlation. Skeletal Radiol 2020;49:677-89. [Crossref]
13. Rubin DA, Britton CA, Towers JD, Harner CD. Are MR imaging signs of meniscocapsular separation valid? Radiology 1996;201:829-36. [Crossref]