

Meniscus Ramp Lesion Scientific Update



An increase in published orthopedic literature regarding meniscus function, pathology, and repair is leading to increased understanding of the importance of meniscal preservation. The meniscus is a fibrocartilaginous structure in each compartment of the knee that aids with dispersing compressive forces. Multiple pathologies, such as direct trauma, overuse, previous injury, and increased age, can lead to meniscus damage.

Advancements in technology and innovation have produced better techniques and instrumentation for meniscus repair. This document summarizes published studies that describe the meniscus anatomy, biomechanical data, surgical techniques, and clinical data specific to the ramp lesions.

Ramp Lesion

Ramp lesions are longitudinal tears of the peripheral capsular attachment of the posterior horn medial meniscus at the meniscocapsular junction, which plays a key role in knee stability. The studies below better define the anatomic structure and operative care for ramp lesions.

Kim SH,
Seo HJ,
Seo DW,
Kim KI,
Lee SH

[Analysis of risk factors for ramp lesions associated with anterior cruciate ligament injury.](#)

Am J Sports Med. 2020;48(7):1673-1681. doi:10.1177/0363546520918207

- This study began with 275 patients undergoing anterior cruciate ligament reconstruction between June 2011 and March 2019.
- Overall, 95 patients (34.5%) were confirmed as having a ramp lesion.
- “The most important findings were that patients with ACL-injured knees with ramp lesions had a higher varus alignment ($>3^\circ\Delta$), a steeper medial tibial and meniscal slope, gradual lateral tibial slope, an increased asymmetry of medial-to-lateral slope, a higher incidence of bone contusion on the medial tibial plateau, and ≥ 3 months from injury to surgery, as compared with patients with isolated ACL injuries.”

Takeaway

Ramp lesions are commonly found along with ACL injuries (35%) but must be specifically looked for intraoperatively. Repairing this lesion is important because patients with a ramp lesion had evidence of greater injury to the medial compartment of the knee than patients with only an ACL tear.

Gülenç B,
Kemah B,
Yalçın S,
Sayar Ş,
Korkmaz O,
Erdil M

[Surgical treatment of meniscal ramp lesion.](#) *J Knee Surg.* 2020;33(3):255-259.

doi:10.1055/s-0039-1677887

- Ramp lesions are challenging to diagnose clinically, radiologically, and surgically. Surgeons should be alerted to the presence of a ramp lesion during surgery.
 - Instability without a visible lesion in the posterior horn of the medial meniscus is a good indicator of a ramp lesion.
- A high healing rate and clinically improved function rates could be achieved with ramp lesion repair.

Takeaway

Ramp lesions are easy to overlook; however, repair is found to significantly increase postoperative knee function scores and patient satisfaction following ACL reconstruction.

Sonnery-Cottet B,
Serra Cruz R,
Vieira TD,
Goes RA,
Saithna A

[Ramp lesions: an unrecognized posteromedial instability?](#) *Clin Sports Med.* 2020;39(1):69-81. doi:10.1016/j.csm.2019.08.010

- Ramp lesions are common but frequently underrecognized in the ACL-injured knee.
- This article is a summary of both preoperative MRI and arthroscopic evaluation via classic anterior portals.
- Failure to recognize and repair ramp lesions is associated with persistent anterior and rotational knee laxity.
- Suture repair of these lesions via a posteromedial portal can restore normal biomechanics and is associated with excellent clinical outcomes.

Takeaway

Ramp lesions occur with great frequency along with ACL injury but are often a missed clinically. Regular exploration of the posteromedial compartment of the knee should be adopted to better diagnose and treat this pathology.

DePhillipo NN,
Moatshe G,
Chahla J,
et al

[Quantitative and qualitative assessment of the posterior medial meniscus anatomy: defining meniscal ramp lesions.](#) *Am J Sports Med.* 2019;47(2):372-378. doi:10.1177/0363546518814258

- Ramp lesions are tears at the posterior meniscocapsular junction and/or tears of the posterior meniscotibial ligament.
- They have a reported incidence of 16% to 24% for all ACL tears.
- The purpose of this study was to improve the understanding of ramp lesions' importance in tears localized at the posterior horn medial meniscus and the anatomic approach to their treatment.
- The findings provide anatomic foundation for an improved understanding of the meniscocapsular and meniscotibial attachments of the posterior horn medial meniscus.

Takeaway

This article provides stronger definitions for the locations of the meniscocapsular and meniscotibial ligament attachments of the posterior horn of the medial meniscus as they relate to ramp lesions.

DePhillipo NN,
Engebretsen L,
LaPrade RF

[Current trends among US surgeons in the identification, treatment, and time of repair for medial meniscal ramp lesions at the time of ACL surgery.](#) *Orthop J Sports Med.* 2019;7(2):2325967119827267. doi:10.1177/2325967119827267

- An electronic questionnaire was sent to 91 directors of orthopedic sports medicine fellowship training programs who are currently performing ACL reconstruction surgery.
- Of the respondents, 86% reported routinely checking for a medial meniscal ramp lesion via inspection of the posteromedial meniscocapsular junction during an ACL reconstruction.
- Of the respondents, 66.7% cited using an all-inside repair technique.
- This information may be useful for current orthopedic surgeons to advance their practice according to current trends surrounding ACL reconstruction and medial meniscal ramp repair.

Takeaway

Inspection for ramp lesions is a growing practice among surgeons. Of the 86% of surgeons who reported routinely checking this pathology, 92% preferred to repair the lesion, and 75% of this group using all-inside techniques.



Balazs GC,
Greditzer HG 4th,
Wang D,
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(5):2325967119843509. doi:10.1177/2325967119843509

- The purpose of the study was to identify the prevalence of, and risk factors for, ramp lesions in patients undergoing ACL reconstruction.
- Of the 372 patients included in the study, 42% had ramp lesions.
- The presence of bone marrow edema of the posteromedial tibia, a contact injury mechanism, or a lateral meniscal tear should alert surgeons to the potential presence of a medial meniscal ramp lesion.

Takeaway

Nearly half (42%) of the patients had ramp lesions along with their ACL injuries. The greatest sign associated with these ramp lesions was bone marrow edema (swelling caused by excess fluid) of the posteromedial tibia on MRI.

Alessio-Mazzola M,
Lovisolo S,
Capello AG,
et al

[Management of ramp lesions of the knee: a systematic review of the literature.](#) *Musculoskelet Surg.* 2019;10.1007/s12306-019-00624-z. doi:10.1007/s12306-019-00624-z

- This was a systematic review to evaluate the current literature and to assess the clinical outcomes following meniscal ramp lesion treatment and ACL reconstruction.
- The review included 7 studies with 509 total patients.
- Treatment failure occurred in 8.3% of patients receiving ACL repair and ramp lesion treatment, showing this is a reliable repair.
- While the repair resulted in good clinical results and low failure rate, more studies evaluating the long-term outcomes are needed.

Takeaway

This literature review indicates that the current practice to repair ramp lesions and clinical results seem favorable.

Negrín R,
Reyes NO,
Iñiguez M,
Pellegrini JJ,
Wainer M,
Duboy J

[Meniscal ramp lesion repair using an all-inside technique.](#) *Arthrosc Tech.* 2018;7(3):e265-e270. doi:10.1016/j.eats.2017.09.001

- The most commonly used technique is to use all-inside sutures, including curved suture hooks through the posteromedial portal. A Meniscal Cinch™ II or FiberStitch™ implant could be used for this application as well.
- Advantages of the all-inside technique include:
 - Correct meniscotibial ligament and meniscal fixations
 - Direct visualization of the meniscus, meniscotibial ligament, device, and anchors
 - Biomechanically stronger

Takeaway

Repair of a ramp lesion can be challenging due to soft tissue retraction. Proper repair of the meniscotibial ligament is key to repairing a ramp lesion and may sometimes require grasping and elevating the ligament before repairing with an all-inside repair device.



[Suture hook versus all-inside repair for longitudinal tears of the posterior horn of the medial meniscus concomitant to anterior cruciate ligament reconstruction: a matched-pair analysis from the SANTI study group. *Am J Sports Med.* 2022;50\(9\):2357-2366. doi:10.1177/03635465221100973](#)

- The goal of this study was to compare secondary meniscectomy rates of suture hook repair compared to all-inside repair.
- This study compared multiple different subgroups of both all-inside and outside-in techniques of ramp repair. The study also found that the suture hook meniscus repair and anterolateral ligament reconstruction group had 3× fewer repair failures than any other subgroup.
- This study retroactively compared 237 pairs of Arthrex QuickPass™ SutureLasso™ suture passer compared to Smith & Nephew Ultra Fast-Fix™. All patients had posterior horn of the medial meniscus (PHMM) ramp lesion repairs along with ACL reconstruction.
- The meniscotibial ligament is the strongest structure connecting the PHMM with the tibial plateau and therefore repairing this structure is essential with a PHMM ramp lesion.

Takeaway

Patients with a Smith & Nephew all-inside repair of their ramp lesion had failure rate 2× greater compared to patients with an Arthrex outside-in suture hook repair through a posteromedial portal (31.2% versus 15.6%). In the discussion, the authors hypothesize that this is due to lack of repairing the meniscotibial ligament with an all-inside technique.