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Bucket Handle meniscus tear after ACL reconstruction: Residual knee laxity treated with Antwerp Monoloop technique

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Faculty Disclosure Information

- We have no conflict of interests to disclosure.

Introduction: General Aspects

- Anatomical anterior cruciate ligament (ACL) reconstruction improves knee stability with excellent outcomes.
- **Meniscal tears** remain a common cause for reoperation, even when the neo-ligament is intact.
- **Rotational control** of the knee is primarily achieved through the reconstructed ACL (rACL), but secondary stabilizers, such as the menisci, may become injured over time if this is inadequate.
- **Residual rotational instability** following ACL injury can be attributed to additional anterolateral soft tissue damage, particularly to the iliotibial band and the anterolateral ligament (ALL).

Introduction: Risk Factors

- Young age.
- Female sex.
- Post-reconstruction knee laxity.
- Pivoting sports.
- Additionally, females have been shown to have a higher risk of rACL failure.

Case Presentation

- **Two cases** of female athletes who underwent rACL at 17 years old.
- One receiving a semitendinosus-gracilis autograft **(Patient 1)**, and the other an allograft **(Patient 2)**.
- Patient 1 is a competitive soccer player, while Patient 2 practices recreational skiing.
- **Four years post-surgery**, both patients experienced knee joint blockage after sports activities involving pivoting movements.
- Both patients exhibited unilateral joint effusion, joint line tenderness, and functional impairment, with their knees in a semi-flexed position and pain during weight-bearing. Due to pain, knee stability could not be assessed at the emergency room.

Case Presentation: Diagnosis and Treatment

- **Magnetic resonance** imaging (MRI) revealed **intact neo-ACLs** in both patients (figure 1 and 2).
- **Patient 1** had a bucket-handle tear of **medial meniscus**, while **Patient 2** had a similar tear of the **lateral meniscus**.There was also a suspicion of residual anterior and rotational instability of the ACL.
- Both patients underwent surgery. Intraoperative evaluation revealed residual anteroposterior instability and significant pivot shift. Arthroscopy confirmed lax, but continuous, neo-ACLs.
- The meniscal tears were reduced and sutured using inside-out and all-inside techniques. Additionally, an anterolateral corner (ALC) augmentation procedure was performed using the Antwerp Monoloop technique (anterolateral tenodesis with the iliotibial band).

Case Presentation: Follow Up

- Both patients had favorable outcomes.
- No wound or knee functionality complications.
- After completing rehabilitation with physiotherapy, they were cleared for competitive sports at five months post-surgery.
- Currently, three years post-operation, neither patient has experienced further injuries. (figure 3).

Case Presentation: Images

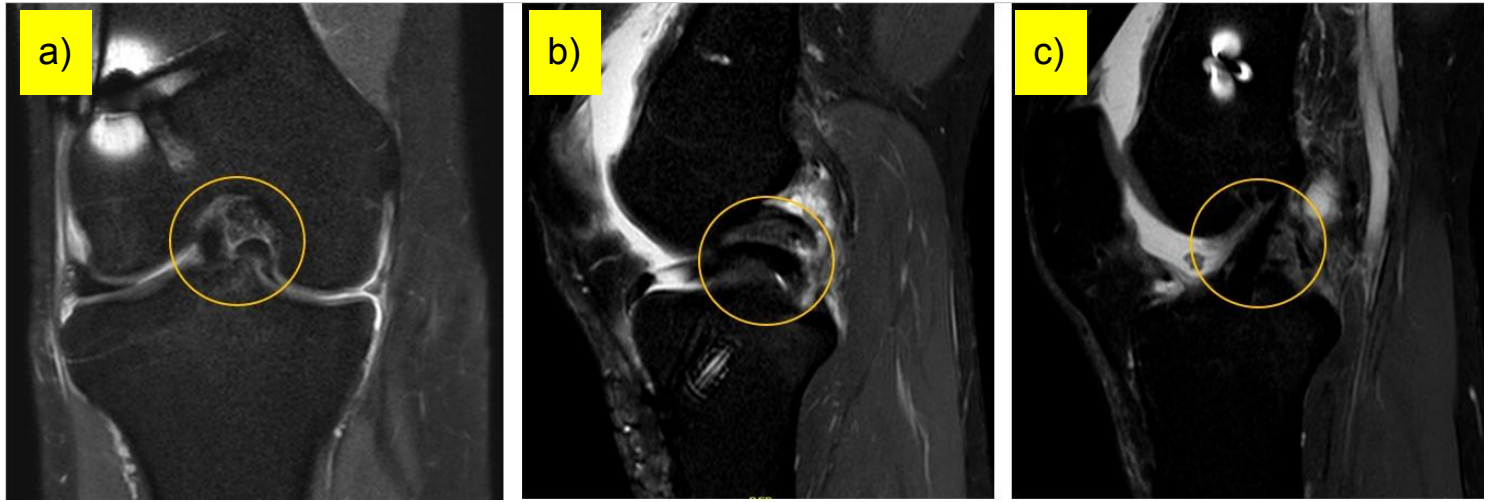

Figure 1.Patient 1 injury images

a) Coronal view from left knee MRI, unscathed neo-ACL and medial meniscus with bucket handle tear.
b) Sagittal view, posterior double cruciate sign.
c) Sagittal view with healthy neo-ACL.

Case Presentation: Images

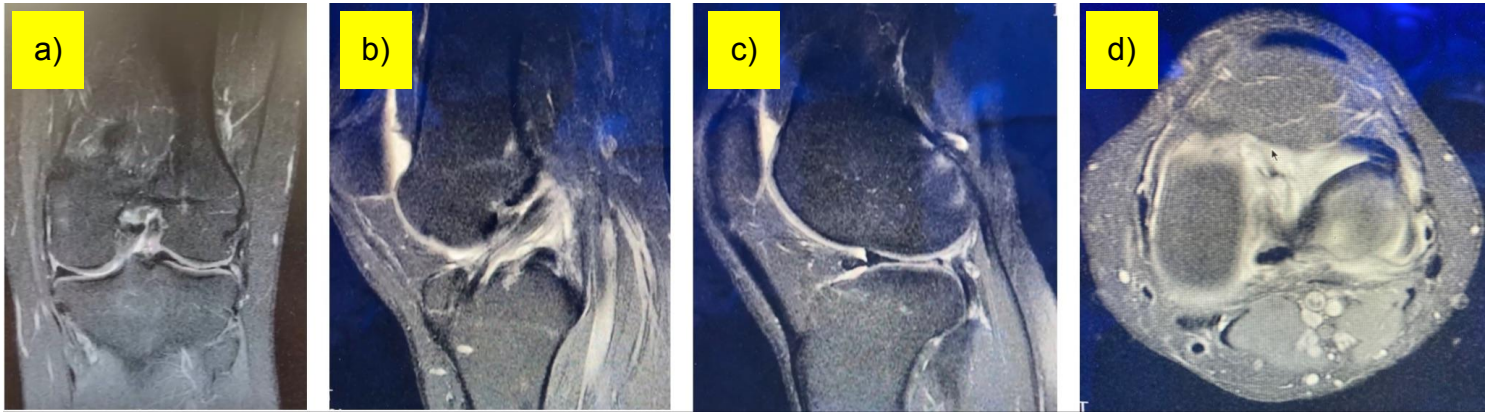

Figure 2. Patient 2 injury images

a) Coronal view from left knee MRI with bucket handle lateral meniscus.
b) Sagittal view of in situ neo-ACL.
c) Sagittal view of posterior horn of lateral meniscus dislocated anteriorly.
d) Axial view of bucket-handle lateral meniscus tear anteriorly.

Case Presentation: Images

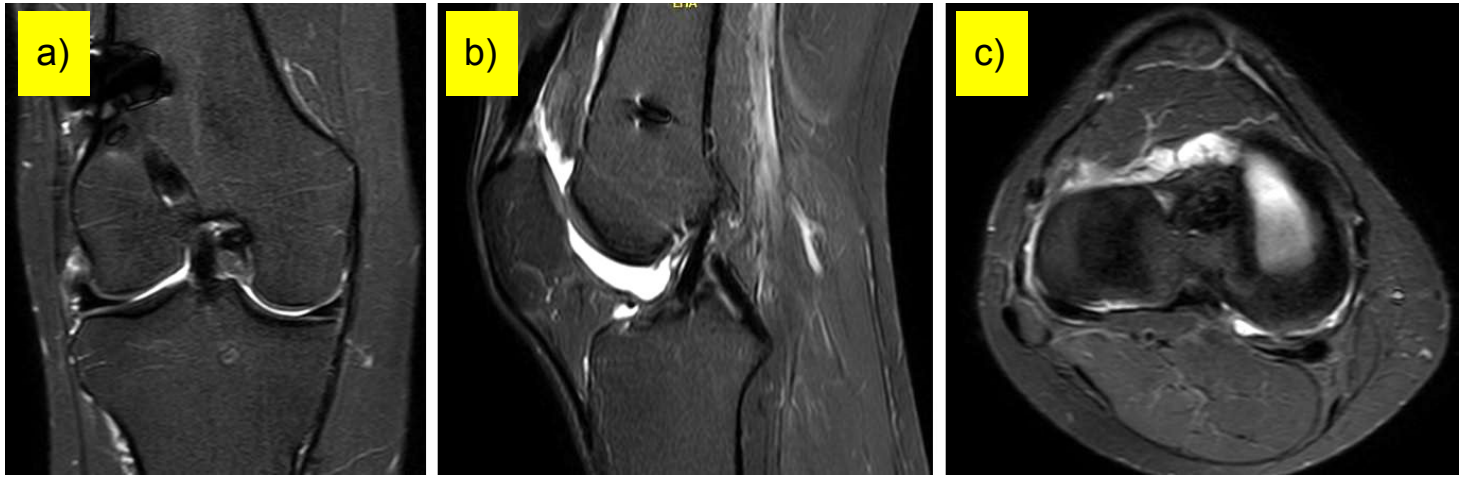

Figure 3. Patient 1 Post op images.

a) Coronal view from right knee MRI, in situ neo-ACL and medial meniscus.
b) Sagittal view, in situ neo-ACL.
c) Axial view, in situs meniscus.

Discussion: General Aspects

- ALC augmentation procedure alongside rACL have shown promise in controlling rotational instability and pivot shift, making this a viable option for revision surgeries, patients with hyperlaxity, high-grade pivot shifts, or those involved in high-demand pivot sports.
- The Antwerp Monoloop technique effectively restored native tibial anterior translation and internal rotational laxity compared to isolated rACL.
- In the presented cases, young female, the absence ALC augmentation procedure, combined with the use of allograft in one case, likely contributed to greater rotational instability, predisposing the patients to meniscal injuries.

Conclusion

- We recommend considering extra-articular stabilization for patients with risk factors for rACL failure who present with isolated BHMT.
- We propose that ALL tenodesis could correct excessive rotational laxity and anteroposterior laxity, protecting the meniscal repair and potentially preventing rACL revision surgery.

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