Clinical Summary

Anterior Cruciate Ligament Allograft Reconstruction Augmented with a Reinforced, Bioinductive Collagen Scaffold in the Setting of Multiligamentous Knee Injury

Authors: Andrew S. Bi, M.D., Andrew J. Hughes, M.B., B.Ch., M.Ch., F.R.C.S., Ian Savage-Elliott, M.D., Dylan Lowe, M.D., and Robert J. Meislin, M.D.

Journal: Arthroscopy Techniques

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Aim:

To describe a reproducible surgical technique for ACL reconstruction using allograft augmented with the BioBrace® bioinductive collagen scaffold, specifically in the context of multiligamentous knee injury (MLKI), with options for both bone–patellar tendon–bone (BTB) and soft-tissue grafts.

Reasons for Augmentation

- Allografts may be preferred in MLKI to reduce operative time and donor-site morbidity.
- Challenges with allografts:
  - Smaller graft diameter
  - Reduced mechanical strength
  - Slower biological incorporation
- BioBrace® augmentation provides:
  - Immediate mechanical support
  - A scaffold for biological remodeling

Surgical Techniques

- Graft Preparation:
  - For BTB allografts, overlay BioBrace® on the soft tissue portion and secure with figure-of-eight sutures
  - For soft-tissue grafts (e.g., quadriceps), trim BioBrace® to match graft length and secure with whip stitch sutures
- Graft Passage & Fixation:
  - Pass the graft arthroscopically
  - Fix with biocomposite interference screws
- Optional: Use leftover BioBrace® for MCL augmentation if needed

Surgical Pearls

- Size tunnels after augmentation to avoid passage issues.
- Secure only ends of BioBrace® to avoid over-tethering.
- Use small-bore needles and heavy braided sutures.

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Discussion:

- Technique is adaptable for both BTB and soft-tissue grafts.
- BioBrace® offers mechanical and biological benefits.
- Particularly useful in cases with small grafts or poor tissue quality.
- Can be applied to primary or revision ACL reconstructions and other ligament repairs.

Key Takeaways

- BioBrace® augmentation in ACL reconstruction is a promising technique for improving graft strength and healing, especially in MLKI.
- Offers a balance of mechanical reinforcement and biological integration.
- Technique is versatile and reproducible, with potential applications beyond ACLR.

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