Sequential Graft Passage and screw insertion for patients with significant soft tissue coverage : Case Demonstration in MPFL Reconstruction

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Rationale for this Technique

In patients with elevated BMI or significant periarticular soft tissue, including muscular individuals, the femoral tunnel aperture becomes buried deep beneath multiple tissue layers, creating substantial technical challenges during MPFL reconstruction. The most critical difficulty occurs during interference screw insertion after graft placement, when the drill hole aperture must be precisely located through dense soft tissue without direct visualization. Traditional approaches often result in prolonged surgical time as surgeons repeatedly attempt to identify the correct insertion point through palpation and probing, increasing the risk of creating false passages, compromising graft position, or missing the intended tunnel entirely. When soft tissue is this deep, surgeons lose the visual cues and ability to feel the tunnel entrance that they normally depend on, turning what should be a straightforward step into a lengthy and challenging process. This technical challenge is not unique to MPFL reconstruction but extends to all ligamentous procedures requiring blind tunnel access, including multi-ligament knee reconstructions, collateral ligament repairs, and other reconstructive procedures where deep soft tissue coverage obscures anatomical landmarks. Our technique uses a wire that stays in place throughout the procedure to guide the screw directly into the tunnel, eliminating guesswork and repeated attempts to find the hole, which saves time and reduces tissue damage while ensuring the screw goes exactly where intended, no matter how deep the soft tissue.

Technique

Following identification of the Schöttle point using fluoroscopic guidance, a guide wire with eyelet is inserted into the anatomic femoral MPFL insertion site. A 4.5mm tunnel is drilled over the guide wire using a cannulated drill, with additional tunnel sizing performed as needed to accommodate the graft. A heavy PDS suture is passed through the guide wire eyelet while maintaining manual control of the free end. The critical step involves inserting a 4.5mm drill in reverse orientation (cannulated end first) over the guide wire until it reaches the eyelet, then advancing a nitinol wire through the drill lumen to create a protected guidance pathway. The entire construct (guide wire, inverted drill, and nitinol wire) is advanced through the bone tunnel until the nitinol wire exits the far cortex. After carefully withdrawing the drill while maintaining the nitinol wire position, the PDS suture loop facilitates graft passage by threading the graft's passing sutures through the looped PDS and gently pulling until the graft is fully seated. With the graft properly positioned at the Schöttle point, the retained nitinol wire provides precise guidance for interference screw insertion from the opposite side, applying appropriate tension to secure the graft. This technique eliminates the need for direct visualization of the tunnel aperture during screw placement, addressing the primary challenge in patients with deep soft tissue coverage while ensuring anatomic graft positioning and stable fixation.