Technical Note

Top Tips for RIGIDfix Femoral Fixation

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Abstract: The use of pin fixation for grafts in the femoral tunnel in anterior cruciate ligament (ACL) reconstruction is becoming more popular. The transtibial stiff femoral guides are necessary to ensure that the pins fix the graft. However, the cross pins can sometimes miss the femoral tunnel. As a result of some technical problems that we encountered, we introduced an extra step in the technique of the Mitek RIGIDfix ACL Graft Fixation System (Mitek Products, Ethicon, Edinburgh, UK). This article suggests some tips for fixing problems that arise in cases in which the graft is accidentally missed with the cross pins. **Key Words:** RIGIDfix—Hamstrings—ACL reconstruction—Cross pins.

Femoral fixation of hamstring tendon grafts using a cross pin is an established technique with excellent biomechanical properties.[1,2] The Mitek RIGIDfix Cross Pin System (Mitek Products, Ethicon, Edinburgh, UK) uses 2 parallel cross pins to anchor the graft in the femoral tunnel. The cross pins are bioabsorbable (PLA) and are inserted with the use of a guide frame. The strength of this construct is about 868 N.[2] An external femoral aiming device is used to predrill the femoral pin holes, and the pins are then hammered in through the graft. This system eliminates the necessity of a passing pin technique.

The goal of this technical note is to show that even with the stiff external femoral guide frame, it is possible for the cross pins to miss the femoral tunnel. We discuss an extra step in the surgical procedure to verify the placement and correct it if necessary.

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SURGICAL TECHNIQUE

The Hamstring graft harvest, arthroscopic assessment, notch preparation, and tibial tunnel creation are performed as per surgeon preference. The femoral guidewire is then drilled with the appropriate femoral jig using the transtibial technique and out through the lateral femoral cortex. The femoral tunnel is drilled to a 30-mm depth with the appropriate reamer.

The RIGIDfix cross pin guide frame is inserted in the femoral tunnel over the guidewire under arthroscopic vision. The lateral femoral condyle is then identified, and the sleeves are checked so that they lie in the center of the condyle. The femoral guidewire is then removed. Stab incisions are made, and the

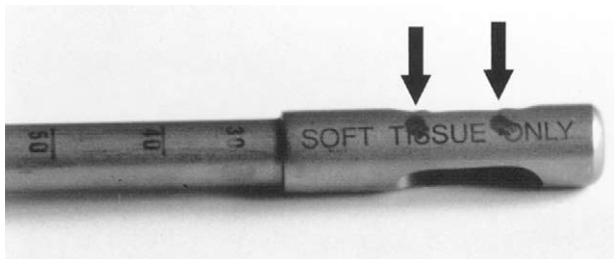

FIGURE 1. This figure shows the burnishing mark on the guide frame jig outside the intended hole.

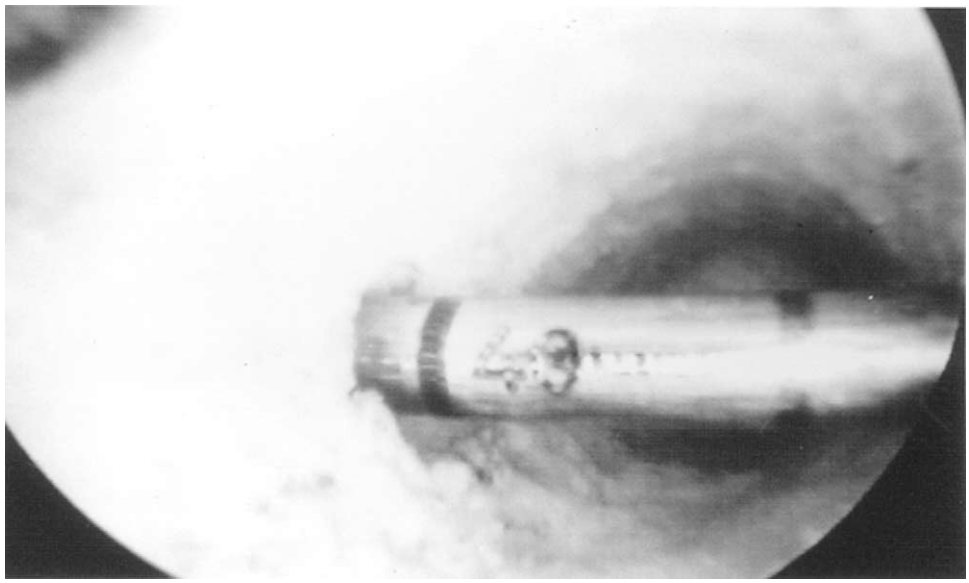

FIGURE 2. This figure shows central and correct placement of the guidewire in the femoral tunnel.

3.3-mm sleeve-trocar assembly is inserted through the jig. Drilling should be slow and firm without pushing too hard, because the trocar can easily miss the locking aperture in the jig. This is shown in Fig 1, with the burnishing mark of the trocar outside the jig.

At this stage, the manufacturer's guide recommends reinserting the guidewire, removing the cross pin guide frame, and inserting the graft.[3,4] However, it is important to check that the pins will be placed in the center of the femoral tunnel and hence through the graft.

Therefore, the guidewire is not reinserted. The guide frame is detached and removed. The arthroscope is inserted through the tibial tunnel into the femoral tunnel. The femoral guidewire is then inserted through each of the sleeves in turn, and the position of the wire is checked in the femoral tunnel. Figure 2 shows proper placement of the guide wire. Figure 3 shows the cross pins in a very superior position of the femoral tunnel. The graft was not held at all in this case. If the guidewire position was checked before inserting the cross pins, incorrect placement would

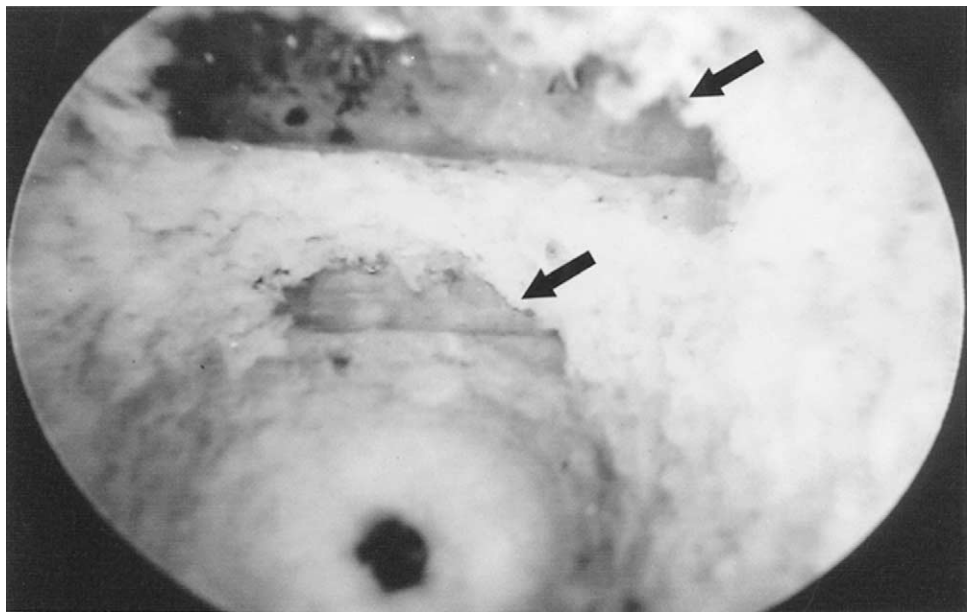

FIGURE 3. This figure shows that the cross pins are in the superior aspect of the femoral tunnel and had missed the graft.

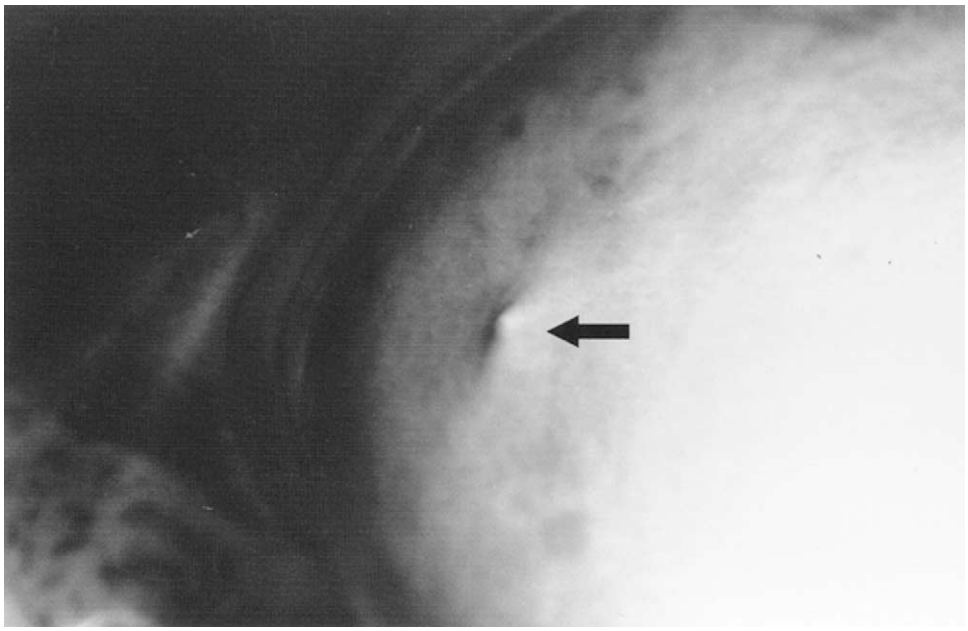

FIGURE 4. This figure shows protrusion of the cross pin on the subcutaneous area of the medial femoral condyle, when the tapping is not stopped at the stepped mark.

have been detected. If the placement is wrong, then the guide frame is reinserted, the sleeve-trocar construct is reapplied, and the holes are drilled at a slightly different angle.

If the guidewire placement is correct, the guide frame is reintroduced into the femoral tunnel under arthroscopic vision, and the guidewire is then reinserted to re-emerge through the lateral femoral cortex. Insertion of the guide frame guarantees that the guidewire will pass through the previous hole. The guide frame is detached and removed. The graft is then pulled through and the Mitek RIGIDfix cross pins inserted. It is important to remember to gently tap the pins and stop at the stepped mark on the stepped pin inserter rod. The cross pins should be tapped gently. The cross pins can easily pass into the medial femoral condyle and even out through the skin if the tapping is not stopped at the stepped mark (Fig 4).

If the pins are accidentally passed through or miss the graft completely, the graft should be retracted out. The guide frame must be reinserted, drill holes are made with a new set of sleeve-trocar constructs, and the new pins are reinserted with the graft once again pulled up into the femoral tunnel.

We believe that checking the guidewire position in the femoral tunnel is an important extra step in the surgical procedure. It ensures that the graft fixation will be adequate and that none of the bioabsorbable cross pins will be wasted. To our knowledge, this method of checking the femoral tunnel before definitive fixation of the graft has not been reported before.

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