[Letter to the Editor]

Anterior Cruciate Ligament Insertion Site and Knee Flexion Angle

We would like to congratulate Dr Frank Noyes for the publication of his article “The Function of the Human Anterior Cruciate Ligament and Analysis of Single- and Double-Bundle Graft Reconstructions” in the first issue of *Sports Health* (volume 1, issue 1, pp 66-75).

In the article, Dr Noyes pointed out that the typical “tibial PL [posterolateral] to femoral AM [anteromedial]” tunnel placement is caused by transtibial drilling approach and that this non-anatomic tunnel placement may be the cause of vertical graft and insufficient restoration of rotational stability in traditional 1-incision anterior cruciate ligament (ACL) reconstruction.

To illustrate this phenomenon, Dr Noyes provided magnificent cadaver dissection pictures to show the AM and PL insertion sites on the femur and tibia.

We completely agree with Dr Noyes, as we named this phenomenon “tunnel mismatch” in our previous publication.¹ However, we would like to suggest that the flexion angle be specified for each surgical or cadaver dissection picture in the future, which will provide the reader a better perception of the insertion site position.

Using Figure 9 as an example, the cadaver femur is shown in approximately 45° of knee flexion, as indicated by the roof of the notch (recognized as Blumensaat's line on lateral radiograph). The femoral AM and PL insertion sites are accurately marked on the specimen. It is easy to imagine that the AM and PL insertion sites would appear at the lower portion of the lateral condyle and be horizontally aligned, if the femur was shown in 90° of knee flexion, as we encounter in ACL surgery. In Figure 6, the femoral insertion sites were marked at similar locations to those in Figure 9, while the illustration was drawn in 90° of knee flexion. Presentation of insertion sites using a consistent and clearly stated femur orientation (preferably 90° of knee flexion) would avoid confusion and facilitate comparisons across different images or studies (see Figure).

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REFERENCES

1. Shen W, Forsythe B, Ingham SM, Honkamp NJ, Fu FH. Application of the anatomic double-bundle reconstruction concept to revision and augmentation anterior cruciate ligament surgeries. *J Bone Joint Surg Am.* 2008;90(suppl 4):20-34.

Figure. Femoral insertion sites of the anteromedial bundle and posterolateral bundle change their orientation throughout knee range of motion. They are vertically oriented in knee extension and horizontally oriented in 90° of knee flexion.