The Rationale Behind the I.D.E.A.L.™ Femoral Tunnel Position Philosophy

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A general consensus from *in vitro* and *in vivo* studies is that the ideal position of the femoral tunnel is when the ACL graft is **I**sometric, in the **D**irect fibers, **E**quidistant and Eccentric, **A**natomic, and **L**ow in tension. The **I.D.E.A.L.** acronym is the foundation for locating the position of the femoral guide wire intraoperatively in the transtibial, anteromedial portal, and two-incision surgical techniques.

The intraoperative check for correct positioning of the femoral tunnel is placement of the guide wire equidistant from the top to the bottom of the notch within the green zone and far enough posterior to position the femoral tunnel with a ≤ 2 mm tunnel backwall[1] (Figure 1 & 2). Centering the femoral guide wire in the green zone has the advantages of setting graft length isometrically,[2] anatomically centering the graft in the direct fibers of the origin of the native ACL,[3] and restoring low graft tension;[2,4,5] which are associated with high function, full motion, and stability.[1]

In contrast, positioning the femoral guide wire so the boundary of the femoral tunnel extends outside the green zone has three undesirable consequences:

1. Placement 'vertical' or above the green zone may cause high graft tension from impingement of the graft against the PCL in flexion, loss of flexion, and a high failure rate.[5]
2. Placement 'low' or below the green zone may cause high graft tension from non-isometric placement in extension, loss of extension, and a high failure rate.[4,6]
3. Placement anterior, so the femoral tunnel has >2 mm backwall, may cause high graft tension from non-isometric placement in flexion, and loss of flexion.[2]

The advantage of the green zone with the I.D.E.A.L. philosophy is it allows an anterior medial or transtibial drilling technique, along with the ability to consistently place the tunnel within the green zone and allows a small amount of latitude in order to support the individuality of the patient's anatomy and notch.

Femoral Guide Wire

Figure 1

Femoral Tunnel

< 2 mm of Backwall

Figure 2

● Green Zone ● Tunnel Too Vertical or Low

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