

2 Screws, 1 Hole: The 1-Incision Technique for 2 Proximal Locking Screws in Retrograde Femoral Intramedullary Nails

Michael Richard Mijares MD; Raul G Gosthe MD; Howard Bar-Eli MD; Milad Alam MD; Steven P Kalandiak MD

Jackson Memorial Hospital , Miami, FL, United States

Purpose: Retrograde femoral intramedullary nails have changed the way we treat certain femur fractures. Two proximal locking screws are typically used in length-unstable, comminuted, and short proximal segment femoral fractures. The proximity of neurovascular structures may result in complications when inserting the proximal locking screws. We describe a simple technique for inserting 2 proximal screws while limiting the risk of neurovascular injury to that equal to 1 screw. With the following technique, a second incision and deep dissection are eliminated, reducing the risk of neurovascular injury and operative time.

Methods: Surgical Technique: After inserting the nail and locking distally using the targeting guide, the 1-incision technique for inserting 2 proximal anterior-posterior locking screws in retrograde intramedullary nails begins by placing the most distal screw first using standard technique with the leg positioned on a radiolucent triangle. This is done by using fluoroscopy, obtaining a "perfect circle" of the distal screw hole, making a 1 to 1.5-cm incision, drilling bicortically with freehand technique, and inserting the appropriately sized screw. Once the nail is locked with 1 screw in the most distal proximal hole, the distal jig is removed so the extremity can then be placed in full extension. This shifts the anterior soft tissues of the thigh and typically aligns the proximal locking hole with the previously created soft-tissue path. Using standard perfect circle technique, the second proximal locking screw can then be inserted via the previous incision. To further lessen the risk of neurovascular injury, our institution uses an "exchange tube" cut at 4 inches in length as a soft-tissue sleeve placed around the drill bit for the proximal interlocking screws. The drill bit is placed on the femur and the exchange tube is slid down to the femur to protect the soft tissue during drilling.

Results: This technique has been performed in over 10 patients with replicable results in obtaining access to and inserting 2 proximal locking screws in retrograde femoral nails using 1 standard incision measuring 1 to 1.5 cm in length.

Conclusion: Several steps can be taken to avoid neurovascular structures during placement of proximal interlocking screws in retrograde intramedullary nails. We recommend this 1-incision technique to minimize soft-tissue dissection when placing these proximal screws, along with use of a soft-tissue sleeve during drilling to protect adjacent neurovascular structures at risk.