Technique for Guiding Distal Locking Screws into Intramedullary Nails

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Summary: Placing distal locking screws into an intramedullary nail can be a difficult step for the young surgeon to master. We propose a step-by-step approach to drilling the distal locking screw holes.

Key Words: intramedullary nail—distal locking screw—technique.

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BACKGROUND

Placing distal locking screws into an intramedullary nail (IMN) can be a difficult step for the young surgeon to master. Crucial preparation for successful placement often includes the use of the image intensifier and the gaining of "perfect circles."[1] Once these "perfect circles" have been achieved a drill is passed through near side cortical bone, near screw hole, far screw hole and then far side cortical bone. Small misdirection in the drill trajectory, will lead either malplacement of the screw, or damage to the nail from the drill, which can potentially weaken the nail. We propose a step-by-step approach to drilling the distal locking screw holes.

TECHNIQUE

Place the drill in the appropriate "center center" position within the "perfect circle" (Fig. 1). Drill the near cortex. Release the drill bit from the power drill and by hand and gentle taps of the mallet, guide the drill bit through the near and far screw holes of the nail (Video 1, Supplemental Digital Content 1, http://links.lww.com/TIO/A26). Drill the far cortex, measure and place the screw (Fig. 2). To avoid inadvertent fracture, be sure to drill and not to tap the drill bit across the far cortex.

DISCUSSION

The placement of screws into an IMN can be challenging to perform and teach. Indirect visualization with the aid of an image intensifier adds to the difficulty. Once a false screw hole has been placed, drilling eccentrically through the nail can cause significant damage, potentially weakening the nail and causing implant failure. Also salvage maneuvres to redirect both the drill and subsequent screw will be required. While the experienced trauma surgeon will often pass the drill in a single motion, training surgeons may lack the

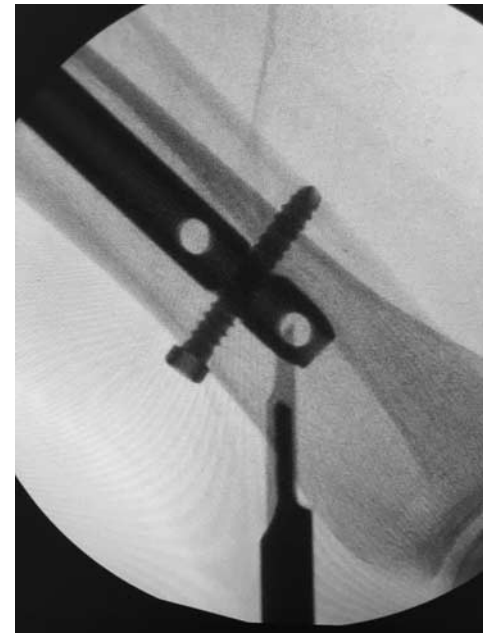

FIGURE 1. With the use of II, perfect circles are achieved.

FIGURE 2. Screws are placed through the nail.

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The authors declare that they have nothing to disclose.

For reprint requests, or additional information and guidance on the techniques described in the article, please contact Jarrad M. Stevens, MBBS, ChM, FRACS, FAOrthA, at drjarradstevens@hotmail.com or by mail at Department of Trauma and Orthopaedics, Southmead Hospital, Bristol, BS10 5NB, UK. You may inquire whether the author(s) will agree to phone conferences and/or visits regarding these techniques.

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tactile feedback and spatial awareness (that comes with experience) to successfully and consistently perform this passage.

Trauma surgeons at the major adult trauma center in Bristol perform over 200 IMNs per year with the majority being performed by training surgeons under consultant supervision. The described technique has been used by the trauma team with a significant improvement in successful first time screw placements. By drilling the near cortex first, uncoupling the drill bit and guiding this through the nail and then drilling through the far cortex, successful passage can be competently and expeditiously achieved by junior surgeons or those who infrequently perform IMN procedures.

REFERENCE

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