

Residents laboratory testing of electromagnetic navigation with the use of micro sensors for free-hand interlocking technique.

M. Tomazevic, A. Fischinger, U. Tominc, A. Kristan, M. Cimerman
Ljubljana/SI

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1. employment or leading position
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Abstract text

Introduction

Distal inter-locking using free-hand technique in intramedullary nailing is always a time consuming procedure. The use of X-ray amplifier is mandatory and the exposure to radiation is rarely modest. If we use navigation devices we rarely trust the device completely and that is why we check the position with X-ray amplifier more than we need to. That is why we did laboratory testing of the new system using the electromagnetic navigation with the use of micro sensors for free-hand interlocking technique in laboratory without the use of X-ray amplifier to ensure the use of system in the operating theatre.

Material and methods

Three residents with little experience in distal interlocking and no experience with this device

were testing the electromagnetic navigation system with the use of micro sensors for free-hand interlocking technique. 100 interlocking holes were drilled by the use of Guiding star platform in Lidis module, Ekliptik, Slovenia. The system producer had 20 minutes of introduction time, afterwards drilling was done. Distal locking was done on UTN Synthes nail and instead of bone, canulated hard wood rods were used. We measured time needed for calibration and time needed for reaming and whether we were successful or not.

Results

Drilling of distal locking holes was successful in 100%. The time needed for calibration was 98,2 seconds in 50 consecutive procedures, the average time for drilling an interlocking hole was 89,8 second in 100 consecutive procedures. To drill the first hole took 101 seconds on average and it took 81,4 seconds to drill the second hole. The learning curve was seen with all three residents.

Conclusion

Electromagnetic navigation with the use of micro sensors proved to be a safe, fast and reliable technique for free-hand interlocking and is now being used in real life surgery with success and confidence.

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