Femoral Fracture Fixation in Developing Countries: An Evaluation of the Surgical Implant Generation Network (SIGN) Intramedullary Nail

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Abstract

Background:
The Surgical Implant Generation Network (SIGN) intramedullary nailing system was designed to treat femoral fractures in developing countries where real-time imaging, power equipment, and fracture tables are often not available. We performed a retrospective analysis of prospectively collected data on femoral shaft fractures treated with the SIGN intramedullary nailing system.

Methods:
Seventy consecutive patients with a closed diaphyseal femoral fracture were treated with the SIGN intramedullary nailing system at Mulago National Hospital in Uganda between February 2007 and March 2008, and fifty of these patients (the study cohort) were followed for at least six months or until fracture-healing.

Results:
The mean time to surgery was 13.2 days (range, zero to thirty-three days). All fractures healed, although two required dynamization for treatment of delayed union. No hardware failures occurred. An interlocking screw missed the nail in two patients, but both fractures healed without complications. One superficial and one deep infection developed; the latter required nail removal after fracture union. Including these patients, complications requiring further treatment occurred in 14% (seven) of the fifty patients.

Conclusions:
The SIGN intramedullary nailing system promotes predictable healing of femoral fractures in settings with limited resources including lack of real-time imaging, lack of power reaming, and delayed presentation to the operating room.

Level of Evidence:
Therapeutic Level IV; See Instructions to Authors for a complete description of levels of evidence.

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