SUMMARY

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The objective of medullary fixation is to control angulatory and rotational forces, and to maintain length of bone.

The addition of locking screws to intramedullary nails has greatly increased the indications of nailing for the internal fixation of complex fractures of the tibia. these screws prevent rotation and telescoping of the fragments thus controlling alignment and maintaning the length of the tibia until union occurs. Early weight-bearing is also possible in most cases fixed by an interlocking nail.

Worries about the vascularity of the tibia and its affection by the reaming and nailing have made medullary fixation less popular in that bone. In a review of the literature, this concern has not borne out in either the experimental studies or the large series of tibial nailing. The use of intramedullary fixation in general is found to be more compatible with the natural healing process of periosteal callus formation. Fixation is rigid enough to allow for proper union, while at the same time allowing for transmission of stress to the bone, so there is no stress-shielding of bone which leads to osteoporosis and cortical thinning, and the possibility of refracture.

We reviewed the results of 52 fractures of the tibial shaft treated by intramedullary nailing. These were either closed fractures or open grade I or grade II Gustilloand Anderson. There were 9 *Minor*, 31 *Moderate*, and 12 *Major* severity fractures according to *Leach's modification of Ellis classification*. There were 9 fractures of the *upper*

third, 16 of the *middle third*, and 19 of the *lower third* of the tibia. Eight fractures were *segmental*.

We had a union rate of 98.1% of cases without the need for any further surgical intervention. Only one patient (1.9%) required renailing and fibular osteotomy at 10 months to achieve union 3 months later. There were 6 cases (11.53%) of delayed union more than 6 months.

We had an infection rate of 9.6% (five cases). All cleared without further consequences.

Malunion occured in five patients (9.6%).

Other minor but common complications include persistent ankle oedema in ten patients (19.2%), and patellar tendonitis in seven patients (13.5%). Ankle joint problems (11 cases) were either related to the original soft-tissue injury of the trauma or to malunion near the joint.

In conclusion, we do not pretend that locked nailing is the final word in treatment of fractures of the tibial shaft that require internal fixation. But it is a very efficient method of treatment of complex fractures that have not found better method e.g. comminuted fractures, segmental fractures and fractures with bone loss. Even in other fractures amenable to other modes of treatment,it offers a valid alternative with all the benefits of closed nailing, early weight-bearing and load-sharing properties.

We would recommend delayed nailing of fractures as it has shown to have possible benefits by allowing some soft-tissue healing, and no obvious disadvantages as regards final results.

Dynamization of statically locked nails is not found to be important.This view is supported by others. We thus would not stress its importonce except if some distraction of the fracture is present and would seem to be leading to pseudoarthrosis.

All precautions should be taken with the use of the image intensifier. The risk of radiation to the surgical team are real, and exposure should be kept to a minimum.

Malunion is a technical mistake and can be prevented by attention to minute operative details, thus removing one of the major complications of an otherwise impressive method of internal fixation with a very high rate of union.