Intramedullary fixation for treatment of tibial shaft fractures

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SummaryThe objective of medullary fixation is to control angulatory androtational forces, and to maintain length of bone.The addition of locking screws to intramedullary nails has greatlyincreased the indications of nailing for the intemal fixation of complexfractures of the tibia. these screws prevent rotation and telescoping ofthe fragments thus controlling alignment and maintaning the length ofthe tibia until union occurs. Early weight-bearing is also possible inmost cases fixed by an interlocking nail.Worries about the vascularity of the tibia and its affection by thereaming and nailing have made medullary fixation less popular in thatbone. In a review of the literature, this concem has not borne out ineither the experimental studies or the large series of tibial nailing. Theuse of intramedullary fixation in general is found to be more compatiblewith the natural healing process of periosteal callus formation. Fixationis rigid enough to allOWfor proper union, while at the same timeallowing for transmission of stress to the bone, SOthere is no stressshieldingof bone which leads to osteoporosis and cortical thinning, andthe possibility of refracture.We reviewed the results of 52 fractures of the tibial shaft treated byintramedullary nailing. These were either closed fractures or opengrade I or grade II Gustilloand Anderson. There were 9 Minor, 31Moderate, and 12 Major severity fractures according to Leach’smodification of Ellis classification. There were 9 fractures of the upper160third, 16 of the middle third, and 19 of the lower third of the tibia. Eightfractures were segmental.We had a union rate of 98.1% of cases without the need for anyfurther surgical intervention. Only one patient (1.9%) required renailingand 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 withoutfurther consequences.Malunion occured in five patients (9.6%).Other minor but common complications include persistent ankleoedema in ten patients (19.2%), and patellar tendonitis in sevenpatients (13.5%). Ankle joint problems (11 cases) were either related tothe 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 wordin treatment of fractures of the tibial shaft that require internal fIXation.But it is a very efficient method of treatment of complex fractures thathave not found better method e.g. comminuted fractures, segmentalfractures and fractures with bone loss. Even in other fracturesamenable to other modes of treatment,it offers a valid alternative -withall the benefits of closed nailing, early weight-bearing and load

sharingproperties.We would recommend delayed nailing of fractures as it has shown tohave possible benefits by allowing some soft-tissue healing, and noobvious disadvantages as regards final results.161Dynamization of statically locked nails is not found to beimportant.This view is supported by others.We thus would not stressits importonce except if some distraction of the fracture is present andwould 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 shouldbe kept to a minimum.Malunion is a technical mistake and can be prevented by attention tominute operative details, thus removing one of the major complicationsof an otherwise impressive method of intemal fixation with a very highrate of union.