

A Prospective, Randomized Controlled Trial of a Fibular Nail Versus Standard Open Reduction and Internal Fixation for Fixation of Ankle Fractures

Timothy O. White, M.D., F.R.C.S., Kate E. Bugler, **Paul T. Appleton, M.D.**,
Margaret M. McQueen, M.D., Charles M. Court-Brown, M.D

Edinburgh, Scotland, United Kingdom

Purpose: The technique of open reduction and internal fixation (ORIF) of ankle fractures with plates and screws has not changed substantially since the 1960s. Three principal complications are associated with this type of surgery. Firstly, wound dehiscence and infection, with published rates of up to 30%, and higher rates in patients with diabetes and neuropathy. Secondly, there is a risk of construct failure, particularly in osteoporotic bone. Thirdly, the scar or prominent hardware may cause later irritation and require further surgery. We have developed a technique of intramedullary fibular nailing that is biomechanically stronger than ORIF, requires only minimal incisions, and has low-profile hardware. We hypothesized that fibular nailing would result in a rate of reduction and union comparable to fixation, with a reduced rate of wound and hardware problems.

Methods: 100 patients over the age of 65 years with unstable ankle fractures requiring fixation were recruited and randomized to undergo fibular nailing or standard stabilization using AO techniques. Immediate weight bearing in cast was permitted. Outcome measures assessed over the 12 postoperative months were: the accuracy of reduction, development of wound complications or radiographic arthritis, range of movement, Olerud and Molander score (OMS), and the total cost of treatment. The mean age was 74 years (range, 65-93) and 75 patients were women. Twelve patients were smokers, two were diabetic, and all had some form of comorbidity, most commonly hypertension or ischaemic heart disease. Three injuries occurred during sport and one after a fall from a height; the remainder occurred after a simple fall from a standing height. 72 patients underwent additional medial fixation.

Results: Significantly fewer wound infections occurred in the fibular nail group ($P = 0.002$). Eight patients (16%) in the ORIF group developed lateral-sided wound infections and required antibiotics. Two of these developed a wound dehiscence and required readmission for surgical débridement and removal of metalwork. In addition, six further patients complained of discomfort related to their wounds or hardware. One patient suffered surgical division of the superficial peroneal nerve and one patient went on to a malunion. No infections or wound problems occurred in the fibular nail group. One patient underwent reoperation during the index admission for loss of reduction, one patient complained of a prominent locking screw, and one patient developed a malunion. The overall cost of treatment in the fibular nail group was less despite the higher initial cost of the implant. At 1 year, fibular nail patients were significantly more happy with the condition of their scar ($P = 0.02$), and had slightly better OMS scores (63 vs 61, not significant [$P = 0.61$]).

Conclusion: The fibular nail allows accurate reduction and secure fixation of ankle fractures with a significantly reduced rate of soft-tissue complications when compared with standard ORIF.

Current Faculty and Residents

28th Annual Meeting of The Orthopaedic Trauma Association

October 3-6, 2012, Minneapolis, MN