

with open tibial diaphyseal fractures admitted between November 1996 and November 2004, and whose medical notes were available were included in the audit.

Results: Sixty-eight patients were available for analysis. They included 44 (65%) male and 24 (35%) female with mean age of 36 (2–101). There were varying grades of injury: 24% Gustillo and Anderson Grade I, 39% Grade II, 16% Grade IIIa, 18% IIIb and 3% IIIc. Only 3% of cases had documented evidence of appropriate wound care in A&E. Ninety-three percent of patients received IV antibiotics given at a mean time from injury of 2 h 37 min. Of the 44% of cases referred to plastics, only 13% (4/30) of referrals were made before the initial procedure. The mean time from injury to initial operative procedure was 9 h 34 min (median 5 h 22 min). Only 23% of cases were carried out with a consultant present. Ten of 62 cases (six lost to follow-up) were complicated by infection, 2 (3%) of which were deep. Two cases of compartment syndrome occurred requiring fasciotomy. All fractures united with a mean time to union of 39 weeks. The most striking problem was the poor quality of note keeping and hence difficulty in obtaining accurate data.

Conclusions: The results show that in a number of crucial areas the guidelines are not adhered to. However, the complication rate in terms of non-union and deep infection is respectable compared to current literature. One cannot read too much into this due to the problems with data collection. The department should examine its current protocol and perform a prospective audit thereby obtaining an accurate picture of its results. In the meantime emergent debridement of soft tissues, fracture stabilisation and early administration of intravenous antibiotics should be supported.

doi: [10.1016/j.injury.2006.06.054](https://doi.org/10.1016/j.injury.2006.06.054)

Fracture strain and stability following additional diaphyseal interlocking screw in tibial nailing—A biomechanical study

M.K. Sayana, B.J. Davis, B. Kapoor, A. Rahmatalla, N. Maffulli

Department of Trauma and Orthopaedic Surgery, Keele University School of Medicine, North Staffordshire Hospital, UK

Purpose of study: To study the effect of an additional locking screw on fracture strain and stability in tibias undergoing intramedullary nailing.

Methods: An additional locking hole was drilled into four tibial nails, 185 mm from the proximal end

of the 8 mm × 315 mm solid tibial nails. The nails were locked proximally and distally into a triple strain-gauged sawbone. An osteotomy was created distal to the additional hole, and the construct loaded axially, in flexion and extension, and in torsion with and without the extra locking screw. With the additional locking screw in place, strain increased at the proximal strain gauge site during loading in neutral by 17% (139 mε, 91–198) ($p = 0.01$) and flexion by 8% (65 mε, 60–73) ($p < 0.005$). Strain decreased on loading in extension by 10% (141 mε, 62–243) ($p = 0.0497$). The extra locking screw decreased strain at the gauge closest to the osteotomy site in all loading positions. Strain showed an overall increase with axial loading of 14% (47 mε, 4–105) ($p = 0.16$), an increase with loading in flexion of 2% (9 mε, –38 to 62) ($p = 0.75$) but a decrease of 47% (254 mε, 6–549) ($p = 0.18$) with loading in extension. A significant reduction in angular motion at the osteotomy site occurred with the addition of the extra locking screw (21° at 34.5 Nm without the screw, 13° at 34.5 Nm with the screw, $p = 0.001$). Additional hole in the shaft of the nail lead to increase the stress from 29 to 48 mPa (29–48 N/mm²) but did not fail when vertically loaded with 450 N applied at rate of 5 Hz sinusoidal waves for 2 million cycles.

Conclusion: Nails with additional locking options, by altering strain and motion at the fracture site, may have the clinical potential to affect fracture healing with relatively low risk of implant failure.

doi: [10.1016/j.injury.2006.06.055](https://doi.org/10.1016/j.injury.2006.06.055)

Evaluation of a new system of wound irrigation and debridement

M.B.S. Brewster, D.M. Power, T. McBride, S. Cutts, V. Rajaratnam

Department of Trauma & Orthopaedics, Coventry, West Midlands, UK

Background: There are various modes of irrigation and debridement used in surgical practice today. These methods are used to deal with all manner of wound types and levels of contamination from dirty traumatic wounds to clean orthopaedic wounds with tissue debris. The common methods in practice range from syringed fluid, fluid through a giving set, high pressure pulsatile lavage (HPPL) and a new method called VersajetTM.

Aims: To compare the efficiency of commonly used forms of wound irrigation with a new system, VersajetTM, in removal of particulate matter from experimentally induced wounds in an animal model.