



Benefits and Drawbacks of Reconstruction Plates and ESIN for Fractured Clavicles

Written by Brian Hoyle

Fernando Brandao, MD, University of São Paulo, São Paulo, Brazil, described a prospective randomized trial comparing midshaft clavicular fractures treated with reconstruction plate fixation or elastic stable intramedullary nailing (ESIN).

Midshaft clavicular fractures make up 80% of all clavicular fractures. Treatment seeks to reduce nonunion of the bone, speed recovery, and produce better functional outcome [Smekal V et al. *J Orthop Trauma*. 2009; Canadian Orthopaedic Trauma Society. *J Bone Joint Surg Am*. 2007]. The conventional treatment involves plate fixation, including reconstruction plates that can be molded to the desired clavicle shape. ESIN, which uses titanium elastic nails, is a more recent development [Jubel A et al. *Kongressband Dtsch Ges Chir Kongr*. 2002]. The techniques have been compared in only a few studies, which were mainly retrospective [Chen YF et al. *J Shoulder Elbow Surg*. 2012; Tarng YW et al. *J Shoulder Elbow Surg*. 2012; Assobhi JE. *J Orthop Traumatol*. 2011].

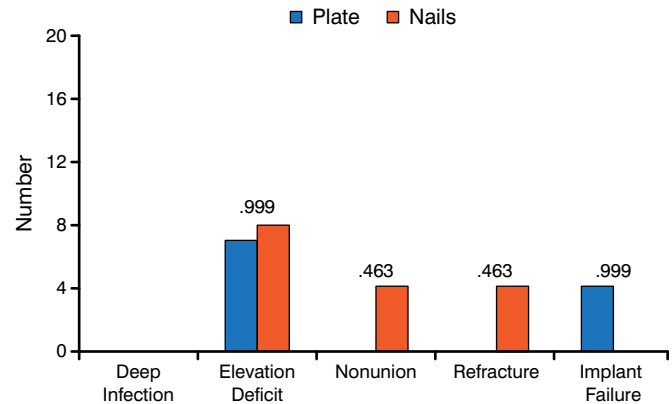
The present single-center clinical trial compared the 2 approaches in terms of the Disabilities of the Arm, Shoulder, and Hand (DASH) score at 6 months postoperatively. Secondary outcomes were DASH score at 12 months, Constant-Murley shoulder outcome (pain and function) score at 6 and 12 months, time to bone union, clavicle shortening, visual analog scale assessment of pain, and complications.

Fifty-nine patients who were enrolled from May 2010 to January 2013 were randomly allocated to receive plate fixation (n = 33) or ESIN (n = 26): 29 and 25, respectively, completed the follow-up. The 59 patients were 16 to 65 years of age (mean 29.9 ± 11.1 years). The majority (n = 47) were male. Shoulder injuries were the result of motorcycle accidents in 54% of patients and falls in 20%. The AO/OTA classification of fractures and dislocations was B1 (39%), B2 (41%), and B3 (20%).

The mean DASH scores at 6 months were 9.9 and 8.5 in the plate and ESIN groups, respectively ($P = .329$). The 12-month DASH scores were similar ($P = .496$). Constant-Murley scores for both groups at 6 and 12 months were virtually identical ($P = .999$ and $P = .937$). No significant differences were evident in time to union (16.8 weeks in the plate group and 15.9 weeks in the ESIN group; $P = .352$) and visual analog scale rating of pain ($P = .673$).

Residual shortening was significantly greater in the plate group ($P = .032$). However, the actual value of 0.4 cm

Figure 1. Major Complications in the Plate and Elastic Stable Intramedullary Nailing Groups



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was not clinically relevant. Hardware-related pain was greater in the ESIN group (n = 10) than in the plate group (n = 4; $P = .035$). The rate of implant bending and subsequent shortening of the clavicle was significantly greater in the plate group (n = 11) as compared with 1 patient in the ESIN group ($P = .003$). Comparison of the DASH and Constant-Murley scores at 6 and 12 months between patients with bent and nonbent reconstruction plate implants did not reveal significant differences. However, time to union was significantly longer in patients with a bent implant ($P = .044$). Major complications occurred at similar frequency in both groups (Figure 1).

The data indicate the similar efficacy and safety of the methods in promoting fracture healing. Reconstruction plates can bend owing to reduced stiffness and thus can be less reliable in maintaining alignment of the healing fracture. ESIN can produce more discomfort to the point of implant removal.

FuncSiE Trial: EM of Elbow Dislocation Brings Faster Functional Recovery

Written by Mary Mosley

The Functional Treatment Versus Plaster for Simple Elbow Dislocations trial [FuncSiE; NTR2025] found that early mobilization (EM) vs plaster immobilization (PIM) resulted in earlier recovery of function and return to work, without any redislocations or persistent instability, according to Dennis den Hartog, MD, Erasmus MC, University Medical Center Rotterdam, Rotterdam, The Netherlands. EM was associated with slightly more pain at 1 week, but pain was similar in both groups at the other time points.

Elbow dislocations are rare (6/100 000 person-years) and always include injury of the ligaments. Complex elbow dislocations include a fracture, and surgical treatment is common. Treatment for simple elbow dislocations (SEDs) without a fracture is conservative and functional and strives to balance stability and prevent stiffness. Currently, there is little evidence on which to base treatment decisions for SED and there is no indication for standard surgical ligament repair [Taylor F et al. *Cochrane Database Syst Rev.* 2012]. Observational studies suggest the outcomes are similar with EM or PIM [De Haan J et al. *Arch Orthop Trauma Surg.* 2010].

The multicenter, randomized FuncSiE study was conducted to obtain prospective evidence with EM and PIM in patients with an SED. EM comprised a pressure bandage or tubigrip, early exercise within the limits of pain, and physical therapy (PT) commencing after 2 days, whereas PIM comprised a long arm cast for 3 weeks and PT commencing after cast removal. Assessments were made at weeks 1 and 3 and months 3, 6, and 12. The study was conducted from August 2009 to September 2012. Of the 100 patients randomized in the study, 48 in the EM group and 52 in the PIM group were available for analysis. In the EM and PIM groups, respectively, 46% and 39% were men, the average age was 43 years and 47 years, the injury was to the dominant arm in 50% and 42% of patients, and most had a low-energy trauma (94% and 92%).

The primary outcome of the Quick Disabilities of the Arm, Shoulder, and Hand score was significantly lower with EM (12) vs PIM (19) in the first 6 weeks ($P < .05$) but was similar (4) at 12 months in both groups.

The Oxford Elbow Score (OES) was similar in both groups at all assessments, whereas the OES functional domain score was significantly higher in the first 6 weeks in the EM vs PIM group (86% vs 73%) but was similar at 12 months (98% vs 97%). The Mayo Elbow Performance Index was about 95% in each group. Pain assessed with a visual analog scale score was significantly higher with EM vs PIM at 1 week (mean score 3.2 vs 2.2, respectively, $P < .05$), but thereafter it was similar (≤ 1) through 12 months in both groups.

The range of motion (ROM) assessed with the flexion/extension (FE) score was 121° with EM and 102° with PIM ($P < .05$) at 6 weeks; at 12 months, it was similar at about 140°. The loss of ROM using the FE score was slightly less with EM vs PIM. The time to return to work and sports is detailed in Table 1. Patients returned to work 8 days earlier with EM vs PIM.

The rate of complications was also similar with EM and PIM in the 40 and 43 patients analyzed, respectively. No redislocation or joint incongruity occurred in either group. Heterotopic ossification occurred in 55% and 65%

Table 1. Time to Resumption of Work and Sports in the FuncSiE Study

	Early Mobilization (n = 48)	Plaster Immobilization (n = 52)
Work		
Working preinjury	32 (67)	32 (62)
Work absenteeism	22 (69)	25 (78)
Resumed (12 mo)	21 (96)	23 (92)
Days to full resumption, n (range)	10 (5–16)	18 (8–41)
Sports		
Sports preinjury	37 (77)	36 (69)
Resumed (12 mo)	28 (76)	27 (75)

Values are n (%) unless otherwise noted.

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of the EM and PIM groups, respectively, most of which was grade 2 (91% and 86%, respectively). Grade 3 ossification occurred in 11% of the PIM group vs none in the EM group.

Short Arm Casting Effective in Type A2 Fractures in the Distal Radius

Written by Emma Hitt Nichols, PhD

Short arm casting with a 3-point molding resulted in improved flexion, supination, and pronation compared with long arm casting in patients with type A2 fractures of the distal radius. Amir R. Kachooei, MD, Mashhad University of Medical Sciences, Mashhad, Iran, presented data from a study [NCT02286661] evaluating the treatment of type A2 fractures of the distal radius by casting.

About 17% of fractures are of the distal radius, with about two-thirds requiring surgical treatment; however, initial treatment typically includes closed reduction and immobilization with a plaster cast [Walenkamp MMJ et al. *BMC Musculoskelet Disord.* 2014]. The purpose of this study was to assess outcomes of 2 different types of casting methods.

In this prospective, multicenter trial, 100 patients with distal radius fractures were randomly assigned to receive a short or long arm cast. All fractures were type A2, and patients with dorsal angulations $> 20^\circ$, radial shortening > 10 mm, and extensive cortical comminution were excluded. Patients in the short arm cast (SAC) group had their wrist positioned in neutral rotation with volar-ulnar deviation. In the SAC, distal extension of the cast was to the metacarpophalangeal joints dorsally, and to the