Sling Compared With Plate Osteosynthesis for Treatment of Displaced Midshaft Clavicular Fractures: A Randomized Clinical Trial


A randomized, controlled trial was undertaken at a Level 1 trauma center to compare operative and nonoperative treatment for displaced midshaft clavicular fractures. Using block randomization, 60 patients were placed in either an operative (n=28) or nonoperative (n=32) group. The authors hypothesized that no differences would be found between the 2 groups on primary and secondary outcome measures.

Fractures were classified according to the AO/OTA classification. Inclusion criteria included a middle-third clavicle fracture that was completely displaced, treatment within 7 days of injury, patient age between 18 and 70 years, and provision of informed consent.

In the nonoperative group, patients were treated with the use of a sling (Polysling; Mölnlycke Health Care, Gothenburg, Sweden) for 3 weeks. Exercise protocol included pendulum motion during the first 3 weeks, active abduction and flexion up to the horizontal plane from 3 to 6 weeks, full range of motion after 6 weeks, and return to full activities after 3 months.

In the operative group, patients underwent surgery within 7 days of injury. An AO/ASIF stainless steel reconstruction plate and 3.5-mm stainless steel cortical screws were used (Synthes, Oberdorf, Switzerland). No bone grafting was performed. Postoperatively, the arm was immobilized in a sling for 3 weeks, and exercise protocol was similar to that in the nonoperative group.

Primary outcome measures were evaluated at 3 months and 1 year postoperatively using the Constant shoulder score and the Disabilities of the Arm, Shoulder and Hand (DASH) score. Secondary outcome measures were evaluated at 3 and 6 weeks, 3 months, and 1 year postoperatively. Outcomes evaluated were pain (measured using the visual analog scale), fracture healing (determined using radiographs), and complications (ie, subsequent surgical procedure, loss of primary reduction, whether fixation failed or resulted in irritation, or whether antibiotics were needed to treat infection).

No differences were found in the Constant score (P=.75), DASH score (P=.89), or pain (P=.98) between the groups at 1-year follow-up. All fractures in the operative group healed, but 6 (24%) nonunions occurred in the nonoperative group.
Clavicle fractures are common injuries seen by orthopedic surgeons. During the past several years, a trend has been observed toward increased operative management of displaced clavicle fractures despite conflicting reports in the literature. Although some studies have demonstrated improved functional and radiographic outcomes with operative intervention, other studies have shown no advantage with surgery.

In this well-designed randomized, controlled trial, the authors compared the functional and radiographic outcomes from operative and nonoperative management of displaced midshaft clavicle fractures. The results showed no difference in functional outcomes between the 2 treatment options. However, a significantly increased rate of nonunion was observed in the nonoperative group. Although patients with nonunions had worse functional outcomes as a group, none of them were symptomatic enough to opt for surgical intervention.

The optimal management of displaced midshaft clavicle fractures remains controversial. Based on the results of this study, it appears that surgical intervention is associated with a higher union rate, whereas functional outcomes are similar between operatively and nonoperatively treated patients. However, the significant nonunion rate in the nonoperative group is of concern, but any associated disability seems to be fairly well tolerated. Although the question of the best treatment option in displaced clavicle fractures remains unanswered, this study provides useful information to share with patients when developing a treatment plan.

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