

Treatment of Humeral Shaft Nonunions: Plate versus Unilateral External Fixator

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Background

Although the use of a plate and intramedullary nail is considered to be the preferred treatment for aseptic humeral shaft nonunion we used unilateral external fixator as minimally invasive method and compared the two treatments in the clinical trial. We could not find any reports comparing two popular techniques on the base of English literature

Methods

We retrospectively reviewed 31 patients (15 men and 16 women) with aseptic humeral shaft nonunion treated by plate and screw system and unilateral external fixator. Patients were followed for a mean of 31.8 months (range, 24 to 46 months). The right upper arm was involved in 19 patients (17 dominant) and left in 12 patients (two dominant). The inclusion criteria were aseptic, middle shaft nonunion, without bone defects more than 2 cm. Four patients had hypertrophic and 27 patients had atrophic nonunion.

Results

Solid union, as documented on plain radiographic views, was obtained in 28 (90.3%) patients. The average intraoperative time was 74.8 minutes in plate group and 32.3 minutes in external fixator group. The average blood loosening was 142.5 ml in plate group and 45.5 ml in external fixator group. Overall, healing time in the plate group was 4.15 months, compared to 3.0 months in the external fixation group. The average score for the patients treated with plate according to the Constant and Murley scoring system was 85.6 points (range, 31 to 94 points) and for the patients treated with external fixator 74.3 points (range, 27 to 94 points). According to Stewart and Hundley criteria, 14 (70%) patients in the plate group and six (54.5%) patients in the external fixator group had an excellent outcome with none or only minimal limitation of elbow or shoulder movement. Pin track infection around the pins was recorded in two (18.2%) patients. Transitory radial nerve palsy that occurred in two (10%) patients treated with plate fixation resolved spontaneously in both patients.

Conclusion

This study showed that unilateral external fixator and limited contact dynamic compression plate are effective treatment for aseptic humeral nonunion.