

## Locked Dorsal Compression Plate Arthrodesis for Degenerative Arthritis of the Midfoot

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**Introduction/Purpose:** Midfoot arthrodesis remains a technical challenge. Little is known of the required magnitude of compression in order to obtain fusion. Multiple techniques have been reported, reflecting the difficulty of achieving a good result. These methods include an in situ bone graft dowel technique, dorsal staple, Kirschner wire, trans articular lag screw, and screw and plate fixation. More recently, dorsal hybrid plating, and slot graft inlay arthrodesis have been described. The purpose of this study is to describe the results of a dorsal fixed-angle locking compression plate in the setting of multiple-joint midfoot arthrodeses.

**Methods:** A retrospective study was performed to identify 62 consecutive patients who underwent midfoot arthrodeses from June 2009 to May 2016. A total of 184 joints were spanned by dorsal fixed angle locking compression plates. The medical risk factors, etiology of arthritis, body mass index, time to union, visual analog pain scores (recorded preoperatively and postoperatively), and post-operative complications were evaluated. Patients were followed for one year. Radiographs were read by two fellowship-trained surgeons to determine the time to fusion. If union was indeterminate, a computed tomography scan was obtained, with the presence of 50% or greater bridging bone as the definition of fusion.

**Results:** Of the joints spanned, 156 fused (83%). The average time to fusion was 19.6 weeks (Standard Deviation 21 weeks). Complications included persistent numbness (10), wound infection (2), and deep venous thrombus (1). The average VAS score diminished from 5.9 preoperatively, to 1.7 at week 6, 1.9 at week 12, 2.6 at month 6, and 3.1 at one year.

**Conclusion:** Despite the difficulty of midfoot arthrodesis procedures in obtaining solid fusion, the dorsal fixed angle locking compression plate demonstrates a union rate, time to fusion, and complication rate that is comparable with the existing literature. The results of this study also indicate room for improvement in the design of advanced plating systems, which could incorporate more uniform joint compression combined with biologic augmentation in the hope of achieving improved radiographic and clinical results.



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