The Use of Nitinol Continuous Compression Implants in Orthopaedic Trauma

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Purpose: Continuous compression implants (CCIs) can provide continuous compression across a fracture or osteotomy site. They are mainly used in foot and ankle surgery, with very limited descriptions in the literature of their potential for trauma or nonunion cases. The aim of this study was to describe the use and associated outcomes of CCIs in modern day trauma practice.

Methods: This was a single-center study with a retrospective analysis of a prospectively maintained database for patients who were treated for an acute fracture or nonunion with a CCI between September 2019 and May 2023. Primary outcome was to determine the function and usage of the CCI and secondary outcomes included unplanned returns to operating room due to infection, nonunion, and failure.

Results: In total, 60 patients were eligible with a mean age of 44.2 years. In total 122 CCIs were used. 51 patients were treated for acute fractures, whereas 9 were treated for nonunions; 27 patients had open injuries. It was deemed that of the 122 CCIs used, 42 were used as definitive fixation (midfoot dislocations, an iliac wing fixation, and isolated medial malleolus fixation), and the rest as adjuncts for fixation; of this remainder, 39 were used for reduction, 38 for fixation of key fragments and 3 for compression. In total, 10 patients returned to the operating room, 2 for failure of metalwork, 2 for infection, and 6 for nonunion (3 of which were nonunions originally).

Conclusion: This series demonstrates a wide indication of successful use of CCIs in trauma for the management of acute fractures or nonunions with their indications being for definitive fixation or as adjuncts to fixation. CCIs demonstrated equivalent rates of infection, failure, and nonunion to other implants and may be a useful tool in the arsenal available to surgeons managing trauma patients.