This article details a study into the effectiveness of using locking compression plates of various sizes to treat distal radial fractures.

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Prospective clinical study: locking compression plate for distal radial fractures

Introduction
At the turn of the millennium, interest in one of the most common of all injuries to the musculoskeletal system—the distal radius fracture—has surprisingly been renewed. We are now confronted with a marked pendulum swing towards stable internal fixation with plates and angular stable screw fixation. Therefore, it is surprising that in the contemporary literature there is little evidence to support this surgical approach with such fractures.

In 2001, a prospective cohort study was initiated under the auspices of AOCID to evaluate the effectiveness of using the locking compression plates (LCPs) 3.5 and the LCPs 2.4, in addition to a conservative arm. Both operative arms were conducted as independent case series in two groups of clinics. The LCP 2.4 plate study was under the supervision of Dr Jesse Jupiter at the Massachusetts General Hospital in Boston (USA) as principal investigator, and Dr Stefan Matschke from the BG Unfallklinik in Ludwigshafen (Germany) was the principal investigator for the LCP 3.5 plate study.

Nine centers contributed to the LCP 2.4 plate study. Over a two year period, 150 patients were recruited with a follow-up rate of 78% (n = 117) at the final two year examination. Inclusion criteria involved unstable fractures in adults over the age of 21 years. Along with thorough demographic data and radiological classification of the fractures, all patients completed a baseline DASH, as well as the SF-36 health status profile upon entry into the study.

The surgical approach was left to the discretion of the treating surgeon with a palmar approach undertaken in 78% of the cases. The patients were followed after six weeks and six, twelve, and 24 months with motion, grip strength, pain, and radiographic analysis carried out at each visit. Patient-rated outcomes were also completed at the one and two year follow-ups.

The mean age of the patients was 51 years with 59% of the population being women, who were significantly older than the cohort of male patients. Eighteen percent of the fractures were AO Comprehensive Classification Type A and 71% were categorized as Type C, with the distal ulna involved in 48%. Only three fractures were open.

Overall, consistently significant improvements were observed in nearly all categories between six months and one year, although not for the two year follow-up. Of note is the fact that while the DASH score improved significantly, it did not return to baseline after two years. Lastly, 15% of the patients had a complication, although all but three were considered minor with tendon inflammation being most common in nine patients.
The combined database
Combining both arms of the implant study provided an extraordinary opportunity to address a number of outcome parameters regarding distal radius fractures, independent of the method of treatment. Our team at the Massachusetts General Hospital in Boston including Dr Sebastiaan Souer, a Dutch PhD student together with Drs David Ring and Jesse Jupiter and AOCID collaborators, identified at least 15 possible topics for further analysis. One notable example was to evaluate the influence of an ulnar styloid base fracture on the outcome of distal radius fractures. Although ulnar styloid base fractures are commonly associated with fractures of the distal radius, their influence on outcome is unclear. Cohorts with and without an untreated ulnar styloid base fracture were compared to observe differences in wrist function and arm specific health status during recovery.

Experience
We are only beginning to utilize this valuable data. Furthermore, the power of this type of collaborative approach is certainly evident in the quality of the data obtained, and will almost certainly result in a higher quality of scientific evidence. We hope that this is just the first of many successful collaborative efforts coordinated by AOCID. Most of all, the interaction with all of the members involved in this project at AOCID has been stimulating and enjoyable.

Many thanks go out to all the participating medical centers whose heroic work in the study and with the collection of data needs to be recognized, since none of this would be possible without them.

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