Anatomic Plantar Plate Repair Utilizing a Weil Metatarsal Osteotomy Approach

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Summary
This is a retrospective case series that analyses the results of a new technique for plantar plate repair.

Introduction
We believe that idiopathic, inflammatory plantar plate attrition is most commonly found with propulsive phase metatarsalgia due to an elongated or sub-located metatarsal. The purpose of this study was to analyze the early results of a new technique for anatomic plantar plate repair and advancement utilizing a Weil metatarsal osteotomy of the second metatarsal.

Methods
We retrospectively identified consecutive adult patients who were diagnosed with MTP instability from January 2007 to December 2009. There were 25 patients (28 cases) who had complete medical records and post-operative follow-up greater than 12 months. Of those patients, we used the American Orthopaedic Foot and Ankle Society Lesser Metatarsophalangeal-Interphalangeal (AOFAS LMI) clinical rating scale and the 12-item short form health survey (SF-12). The visual analog scale was compared pre-operatively to post-operatively at final follow-up. A paired student t-test was used to determine significance with p < 0.01.

Results
There were 25 patients (28 feet) that underwent plantar plate repair. Eighteen were female and seven were male with an average age of 55.6 (range from 35 to 69). The average post-operative follow-up was 22.5 months (range from 13.0 to 38.4). Average pre-operative VAS scores were 7.4 (SD = 1.7; 95%CI = 6.8 to 8.0) compared to post-operative scores of 1.7 (SD = 1.9; 95%CI = 1.0 to 2.4). This was significantly different (P < 0.01). From the clinical outcome surveys, the average post-operative AOFAS LMI was 87.7 (stdev = 10.1; 95%CI = 84.0 to 91.4) out of 100, and the average SF12 physical component score and mental component score was 54.8 and 59.7, respectively. There were two (7.1%) reported peri-operative complications including one delayed union (3.5%) and one dressing-blister that developed into a dorsal wound (3.5%).

Conclusions
This unique surgical technique addresses metatarsal overload and the instability of the second metatarsophalangeal joint while allowing for anatomic repair of the plantar plate pathology. Our study demonstrates favorable results of our unique technique with regards to patient pain and clinical outcome scores.