PAPER SESSION 17: FOREFOOT

Moderators:
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11:03 am
Metatarsophalangeal Joint Arthrodesis with a Hybrid Locking Plate and a Plantar Neutralization Screw: A Prospective Study

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Summary:
Outcome scores in 46 patients indicate that first MTP joint arthrodesis with a pre-contoured dorsal titanium plate with locking screws in the phalanx, non-locking screws in the metatarsal, and a plantar neutralization screw is both reliable and reproducible. The 98% union rate in 48 feet indicates a high success rate.

Introduction:
Many techniques exist for arthrodesis of the first MTP joint. The purpose of this study was to determine the results of a method using dome-shaped reamers to prepare the joint surfaces and fixation with a low-profile dorsal titanium plate with locking screws in the phalanx and non-locking screws in the metatarsal.

Methods:
Forty-nine patients (51 feet) underwent first MTP joint arthrodesis in a one year period. All patients were evaluated preoperatively and postoperatively for primary pathology, pain, function, radiographic findings, AOFAS scores, satisfaction, and physical exam findings. Arthrodesis was performed with a dorsal titanium plate with preset valgus and dorsiflexion. Locking screws were used in the phalanx and non-locking screws were used in the metatarsal. A plantar neutralization screw was added for additional stability after the plate was applied.

Results:
Forty-six of 49 (48 of 51 feet) patients returned for final follow-up examination at least 12 months after operative intervention. Forty-one patients (89%) reported good to excellent results. Visual analog pain scores improved from an average of 6.6 preoperatively to an average of 1.6 postoperatively (t = -9.3339, df = 45, p < .001). Functional capacity scores improved from a preoperative mean of 2.5 to a postoperative mean of 1.4 (t = -5.2648, df = 46, p < .001). AOFAS hallux MTP joint scores improved from a preoperative mean of 45 to a postoperative mean of 77 (t = 9.9498, df = 46, p < .003). Eighteen of 48 great toes (38%) had preoperative pronation whereas, only two of 48 great toes (4%) had postoperative pronation. Eleven of 46 patients (24%) were unable to perform preoperative toe rise, and eight of 46 (17%) were unable to perform postoperative toe rise. Twenty-five of 46 patients (54%) had gait improvement, while 19 patients (44%) had no change in gait, and two patients (4%) had gait deterioration. The mean preoperative hallux valgus angle of 27 degrees improved to a mean postoperative angle of 13 degrees (t= -6.1982, df = 46, p < .001). The mean preoperative 1-2 intermetatarsal angle of 12 degrees improved to a mean postoperative angle of 9 degrees (t = -5.2614, df = 46, p < .001). There was one delayed union (2%) and one nonunion (2%). There were no hardware failures or hardware removals at the time of final follow-up.

Conclusion:
Outcome scores in 46 patients indicate that first MTP joint arthrodesis with a pre-contoured dorsal titanium plate with locking screws in the phalanx and non-locking screws in the metatarsal is both reliable and reproducible. The 98% union rate in 48 feet indicates a high success rate.