Arthrodesis of Ipsilateral Hallux Metatarso-phalangeal and Interphalangeal joints

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Summary:
To review the result of ipsilateral first metatarsophalangeal and interphalangeal joint arthrodesis.

Abstract:
Background
There are very few studies evaluating the outcome of ipsilateral first metatarsophalangeal and interphalangeal joint arthrodesis. One recent study of five patients reported good pain relief and a low complication rate. Although double arthrodesis of the hallux appears to be a reasonable option to treat pain derived from destructive joint pathology, there is concern that fusions on both sides of an intercalary bony segment may result in biomechanical adverse effects including non-union, pain or other complications.

Methods
This is a retrospective review of sixteen feet in sixteen patients who had arthrodesis of first metatarsophalangeal and interphalangeal joint at an average follow up of nineteen months (range 12 to 54 months). Indications (diagnoses) were: rheumatoid arthritis in 12 patients and revision of failed prior hallux valgus surgery in four patients. Arthrodesis procedures were done using one or two longitudinal screws for interphalangeal joint and one or two longitudinal screws for metatarsophalangeal joint. Iliac bone grafting was utilized in one patient. In six patients metatarsophalangeal joint arthrodesis procedures were done first, in five patients interphalangeal joint arthrodesis was done before metatarsophalangeal joint arthrodesis, and the other five patients had simultaneous arthrodesis surgery. Concomitant forefoot procedures were performed in 15 patients. Outcomes were assessed by radiographic evaluation, the hallux metatarsophalangeal interphalangeal scale of the AOFAS survey, and a questionnaire of subjective satisfaction.

Results
Of the sixteen patients studied, seven (44%) developed a non-union. All of these represented non-union of the interphalangeal arthrodesis. Of the seven non-unions, three were symptomatic. Aside from non-union, other complications were experienced by six patients (37.5%). These included mal-union, painful and infected hardware, and painful callus, usually at the tip of the hallux. Four patients had a less than ideal fusion angle in the metatarsophalangeal joint, and three of them were unsatisfied with the result to some extent. No wound healing problems were reported. Four of the 16 patients went on to subsequent operations related to the hallux, including hardware removal (3) and revision IP joint arthrodesis (1). Five other patients (31.2 %) had subsequent procedures related to the lesser toes or ankle. The hallux scale of the AOFAS score increased from an average preoperative value of 21.3 to 63.8 postoperatively. After surgery all patients were able to use nonprescription shoes, although eight (50%) used custom orthotics. Satisfaction was rated as “very satisfied” by ten patients, “satisfied with minor reservations” by five patients, and “not satisfied” by one patient. 13 of the 16 patients stated they would “do it again.” We found no trend in the correlation between the presence of RA with respect to fusion rate, AOFAS score, or patient satisfaction. In addition, we found no trend in the correlation between fusion rate and patient satisfaction.

Conclusion
Although infrequent, there are patients who, either by joint destruction from rheumatoid arthritis or the failure of previous attempted bunion surgery require arthrodesis of the ipsilateral first
metatarsophalangeal and interphalangeal joints of the hallux. This series is the largest reported to date. Our series showed significant complication rates, both in achieving solid union of the interphalangeal joint, and in terms of achieving satisfactory bone position, soft tissue condition, and pain relief. Reoperations for the hallux and lesser toes were not infrequent. The surgical outcomes appear limited by the mechanical stress of arthrodesis of both joints of the hallux. Satisfactory functional outcome is similarly adversely affected by the technical difficulties of achieving mild extension alignment of MTP and neutral to mild flexion of the IP joint. While the non-union rate is high, patient satisfaction does not seem to correlate with achievement of successful IP joint fusion.

Keywords: Arthrodesis; Interphalangeal; Metatarsophalangeal