**COMMENTARY & PERSPECTIVE**

**Joint Preservation in the Rheumatoid Forefoot**

Commentary on an article by Junichi Kushioka, MD, et al.: “Modified Scarf Osteotomy with Medial Capsule Interposition for Hallux Valgus in Rheumatoid Arthritis. A Study of Cases Including Severe First Metatarsophalangeal Joint Destruction”

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The rheumatoid forefoot often involves symptomatic hallux valgus, sometimes associated with varying degrees of hallux rigidus. There are frequent concurrent claw and hammer toe deformities, which, when associated with metatarsophalangeal (MTP) joint dislocation, can be accompanied by substantial metatarsalgia. Patients with rheumatoid arthritis often do not report arthritic pain in the forefoot but can be fairly symptomatic from pressure over osseous prominences, particularly the prominent medial eminence of the first metatarsal head associated with hallux valgus and the prominent plantar aspects of the lesser metatarsal heads associated with dislocated hammer toes. Joint destruction, ligamentous attenuation, and muscle imbalance are often causative factors in the development of these deformities. Surgical treatment is typically geared toward correcting deformity and then attempting to maintain deformity correction by arthrodesis and/or addressing muscle imbalance and contracture, particularly when ligamentous repair or imbrication is not possible.

First MTP arthrodesis and resection and pinning of all 4 lesser metatarsal heads have been historically considered by many to be the “gold standard” treatment. Muscle balance and deformity correction are provided, and the risk of vascular compromise to the toes is decreased, by bone resection through the first MTP fusion site, lesser metatarsal heads, and sometimes lesser proximal interphalangeal joints, thereby relatively lengthening the contracted toe flexor and extensor tendons and realigning the pull of the intrinsic interossei and lumbrical muscles. Very good results have been reported in the literature for this technique1, which is particularly applicable for patients with severe joint destruction or relatively low functional demand.

However, there are also patients for whom joint-preserving procedures may be more beneficial, including younger and more active patients; patients with good first MTP range of motion and/or mild to moderate arthritis; those who have involvement of only 1, 2, or 3 of the lesser MTP joints; and those who have only mild lesser-toe MTP arthritis.

In their excellent paper, Kushioka et al. add to the previous literature with respect to the possibility of preservation of the first MTP joint in patients with rheumatoid arthritis. They show that their technique produces good results—not just in the patients with mild to moderate deformity and arthritis who would be routinely treated with a first metatarsal osteotomy and distal soft-tissue procedure rather than a fusion if they did not have rheumatoid arthritis, but also in those with severe deformity and/or arthritis changes. One of the keys to the success reported by Kushioka et al. is likely the shortening of the first metatarsal through the Scarf osteotomy cuts, a technique also applicable to the non-rheumatoid foot. This shortening decreases the tension across the flexor and extensor tendons of the hallux, allowing them to be realigned over the center of motion of the first MTP joint while correcting the hallux valgus deformity without restricting first MTP motion. It also allows appropriate hallux length relative to the shortened lesser metatarsal heads for a more even distribution of weight-bearing forces throughout the forefoot.

The authors also add an interesting tissue interposition technique, placing a medial capsular flap through the first MTP joint and attaching it to the lateral aspect of the capsule. Because the study did not include a control group treated without the medial capsular interposition, it is difficult to know how much the interpositional arthroplasty added to the authors’ good results. Procedures that decompress and realign the first MTP joint through metatarsal or phalangeal osteotomy as well as those that distract the joint space with interposed tissue or implants both have some support in the literature with respect to the treatment of hallux rigidus. Nevertheless, the medial capsular interposition technique appears worthy of consideration and future study, particularly for patients who have rheumatoid arthritis, hallux valgus, and more severe hallux rigidus, and potentially for similar patients with non-inflammatory arthritis. However, it is unclear what benefit the medial capsular interposition would provide in terms of preventing the development or progression of arthritis in patients with rheumatoid arthritis but no or minimal arthritic changes. It is also unclear whether sacrificing some of the supportive medial capsular tissue may increase the risk of recurrent hallux valgus deformity, although the recurrence rate of 16% in this study does not seem excessive for this challenging patient population.

While not the focus of their paper, Kushioka et al. also build on the previous work of others, including Hansen2, Hanyu et al.3, and Barouk and Barouk4, by addressing the lesser MTP joints with metatarsal shortening osteotomies in 63 of the 76 feet in the...
study. The authors do not state whether the technique involving metatarsal osteotomy and Kirschner wire fixation was reserved only for patients without severe lesser-toe MTP joint arthritis and metatarsal head destruction or, if it was, whether in their practice they treat patients with severe lesser-toe MTP joint arthritis with metatarsal head resection in conjunction with their modified Scarf procedure for the hallux valgus deformity. Either way, it would likely be important at the end of the procedure that the first metatarsal head be similar in length to the second metatarsal head or remnant in order to balance weight-bearing pressure distribution and to provide lateral support to the first metatarsal head. Anecdotally, a relatively long first metatarsal head and hallux may increase the risk of recurrent hallux valgus deformity while a relatively long second metatarsal head or remnant may increase the risk of recurrent second-toe metatarsalgia.

In summary, in their very well-conceived paper, the authors provide additional evidence that joint preservation surgery is a reasonable option for many patients with rheumatoid arthritis, even those with severe hallux valgus and hallux rigidus, and describe helpful techniques to achieve good results in these patients. While follow-up of longer than 2 to 4.7 years will be required to assess the long-term effectiveness of this procedure, particularly with respect to progression of arthritis and recurrent deformity, the early to intermediate-term results appear promising.

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References