

## Outcome of Keller resection arthroplasty in the rheumatoid foot.

### A radiographic follow-up study of 4 to 11 years

Sirs,

Deformities of the forefoot are common in rheumatoid arthritis (RA) and destruction of the metatarso-phalangeal joints (MTP) occurs early, causing often disabilities (1-3). The Keller procedure, where the proximal part of the proximal phalanx is resected, is widely used to correct hallux deformity and painful bunions in the MTP I joint. After Keller resection arthroplasty, hallux valgus (HV) deformity may recur, and arthrodesis of the MTP I joint has been used as an alternative method (4-6). Here we evaluated the long-term results of the Keller procedure in patients with RA.

In a long-term survey of arthritis conducted in Heinola, 103 patients (70 women) with recent (6 months) rheumatoid factor (RF)-positive RA have been followed prospectively for over 20 years (7). A total of 68 patients from this cohort participated in follow-up examinations in 1995 - 1996. 28 patients had died and 7 did not attend.

According to the study protocol, radiographs of the forefoot were taken at the check-ups. Reconstructive surgery of the big toe was performed in 36/206 MTP I joints (17.5%)

and in 26/103 patients (25.2%) during the follow-up. The Keller procedure with metatarsal head excisions was performed in 16 patients; the mean age of these patients at the time of the operation was 47.2 (SD 9.2) years. One patient undergoing the Keller procedure was excluded, because the resection arthroplasty was performed without excision of the lesser metatarsal heads. The Keller procedure with metatarsal head resections (II - V) was performed in 23 feet of 16 patients (11 women). Nine procedures were performed on the right hallux and 14 on the left. The MTP I joint was fused in 11 feet of 9 patients (including one conversion from Keller arthroplasty to fusion). Radiographs were evaluated pre-operatively, 4 - 6 years and 8 - 11 years from the Keller procedure. The HV angle was measured, as well as the Larsen grade of the MTP I joint (8). Statistical analysis was performed using the Mann-Whitney test with exact p-values.

The mean pre-operative Larsen grade of the MTP I joints was 1.9 (SD 1.4). Pre-operatively, the mean HV angle was 25.3° (range 14 - 44°), after 4 - 6 years 24.5° (8 - 42°), after 8 - 11 years 28.4° (14 - 50°). No significant difference was found between the situation pre-operatively and at any post-operative time interval. Hallux varus was present post-operatively in one foot, which after 8 years had a valgus angulation. Bilateral operations were performed in 5 patients simultaneously. Spontaneous fusion occurred after the Keller procedure in one foot, and in one toe arthrodesis was performed 5 years after the resection arthroplasty. Erosive changes were present in 4/20 of the resected MTP I joints 4 - 6 years after the procedure, and in 7/15 after 8 - 11 years. A total of 11/15 (73%) feet without fusions showed recurrence of HV and/or erosive destruction 8 - 11 years after the resection arthroplasty. The situation 12 years after the Keller procedure is illustrated in Figure 1.

After resection arthroplasty, rheumatoid activity may continue on the cartilaginous surface of the metatarsal head, and this continuous process may destroy both the metatarsal head and the resected proximal phalanx, as well as damage ligament integrity leading to recurrence of the deformity. In the present series, the erosive process continued after resection arthroplasty, and 10 years post-operatively in half of the cases increased erosive destruction was observed. Thus, we agree with earlier studies which conclude that the Keller procedure combined with lesser metatarsal head excisions is not to be recommended in RA (5, 9). Arthrodesis of the MTP I joint provides more stability and improves the cosmetic appearance of the foot (6). After the Keller procedure the risk of second-

ary surgery is significant, and arthrodesis of the MTP I joint may provide better and long-lasting results in patients with RF-positive RA (10).

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## Familial Mediterranean fever with HLA B-27 positive ankylosing spondylitis in a young Armenian man

Sir,

Seronegative spondyloarthropathy (SNSA) is one of the known rheumatological manifestations of familial Mediterranean fever (FMF) (1). However, even in patients with



**Fig. 1.** Severe erosive changes in the resected first metatarsophalangeal joint in a patient 12 years after a Keller procedure.