

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%)



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

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).

E.A. BELT, MD M.J. KAUPPI, MD
K. KAARELA, MD M.U.K. LEHTO, MD

*Please address correspondence to:
Eero Belt, MD, Rheumatism Foundation
Hospital, FIN-18120 Heinola, Finland*

References

1. VAINIO K: The rheumatoid foot: A clinical study with pathological and roengenological comments. *Ann Chir Gynaecol Fenniae* 1956; 45 (Suppl. 1): 1-107.
2. KIRKUP JR, VIGIDAL E, JACOBY RK: The hallux and rheumatoid arthritis. *Acta Orthop Scand* 1977; 48: 527-44.
3. PRIOLO F, BACARINI L, CAMMISA M, CERASE A, FERRARA R, DELLA CASA-ALBERIGHI O: Radiographic changes in the feet of patients with early rheumatoid arthritis. *J Rheumatol* 1997; 24: 2113-8.
4. VAHVANEN V, PIRAINEN H, KETTUNEN P: Resection arthroplasty of the metatarsophalangeal joints in rheumatoid arthritis. *Scand J Rheumatol* 1980; 9: 257-65.
5. MCGARVEY SR, JOHNSON KA: Keller arthroplasty in combination with resection arthroplasty of the lesser metatarsophalangeal joints in rheumatoid arthritis. *Foot Ankle* 1988; 9: 75-80.
6. MANN RA, THOMPSON FM: Arthrodesis of the first metatarsophalangeal joint for hallux valgus in rheumatoid arthritis. *Foot Ankle* 1997; 18: 65-7.
7. BELT EA, KAARELA K, LEHTO MUK: Destruction and arthroplasties of the metatarsophalangeal joints in seropositive rheumatoid arthritis. A 20-year follow-up study. *Scand J Rheumatol* 1998; 27: 194-6.
8. LARSEN A, DALE K, EEK M: Radiographic evaluation of rheumatoid arthritis and related conditions by standard reference films. *Acta Radiol Diagn* 1977; 18: 481-91.
9. STOCKEY I, BETTS RP, GETTY CJ, ROWLEY DI, DUCKWORTH T: A prospective study of forefoot arthroplasty. *Clin Orthop* 1989; 248: 213-8.
10. HÄMÄLÄINEN M, RAUNIO P: Long-term follow-up of rheumatoid forefoot surgery. *Clin Orthop* 1997; 340: 34-8.

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

Letters to the Editor

ankylosing spondylitis (AS) HLA B-27 has not been reported in FMF (2-4). Here, we describe a 21 year-old Armenian male with FMF associated with HLA B-27 positive AS. The patient presented with inflammatory low backache of one year duration and pain in the left hip of 15 days duration. In the past he had suffered from hip and knee arthritis that subsided on symptomatic treatment. Since the age of 14 years he was diagnosed as having FMF because of recurrent short-lived attacks of high-grade fever, associated with severe diffuse abdominal and pleuritic pain. There was a family history of FMF; his mother and elder sister had FMF, and one of his maternal uncles had FMF with severe crippling arthritis.

Positive physical findings in the patient included a wide based antalgic gait, limited lumbar spine mobility in all directions (Schober's test positive, 3 cm), painful restriction of movement, and tenderness of the left hip. Positive investigative findings included a high erythrocyte sedimentation rate (65 mm/1 hr), high white blood cell count ($12.9 \times 10^9/l$), mild elevation of alkaline phosphatase (267 IU/l), and high C-reactive protein (5.1 mg/dl; normal 0 - 0.8 mg/dl). Radiological studies showed bilateral sacroiliitis (grade 4), marked narrowing of the joint space and irregularity of the articular surface of both hip joints, straightening of the lumbar spine, and squaring of the vertebral bodies that was considered diagnostic of AS (Fig. 1). On tissue typing he was found to be positive for HLA B-27.

He showed a satisfactory response to the addition of methotrexate (7.5 mg in single weekly dose), folic acid (5 mg on alternate days) and prednisolone (7.5 mg per day) to his daily dose of colchicine, which was increased to 2 mg per day. Advice on physical measures to relieve pain, maintain the range of movement and improve muscle power around both hip joints, as well as to maintain and improve gait and posture during sitting and walking, was also given. During a follow-up of three months he did not experience any further attacks.

FMF is of interest to rheumatologists because of the various types of arthritic involvement possible. Recent studies have described at least 6 different patterns of joint involvement in FMF (5). The initial symptom in our patient was recurrent, acute monoarthritis of the transient variety involving the hip and knee. Over a period of time, this progressed to involvement of several of the axial and peripheral joints with clinical features typical of AS. Over the years, increasing number of SNSA cases in FMF (up to 0.4%) have been reported in the literature. However, all of these cases have been HLA B-27 negative (4, 6, 7). In contrast, our case was positive for HLA B-27. It is difficult of course to say whether these two diseases were causally related or whether this represented the chance occurrence of two unrelated diseases in the same subject. HLA-B27 shows a strong association with AS, but the strength of this association and its prevalence in the population differs appreciably among different racial and

ethnic groups (8). It is known that Arabs have a low prevalence of HLA B-27 (9, 10). Yet Palestinians among the Arabs have the highest prevalence of FMF. Armenians may have a similar genetic background. This could be the reason for the paucity of case reports of HLA B-27 positive AS in FMF. Thus, even if FMF may predispose these individuals to SNSA (including AS), it would manifest only rarely because of the low prevalence of HLA B-27 in these patients.

P. KAUSHIK, MD

N.I. EL-SOBKIE, MD

D. SHEHAB, FRCPC

A.N. MALAVIYA, MD, Professor

Department of Medicine, Mubarak Al-Kabeer Hospital, Ministry of Health, Safat, Kuwait.

Please address correspondence and reprint requests to: Prof. A.N. Malaviya, Department of Medicine, Faculty of Medicine, P.O. Box 24923, Safat, Kuwait code 13110.

References

1. BEN-CHETRIT E, LEVY M: Familial Mediterranean fever. *Lancet* 1998; 351: 659-64.
2. LANGEVITZ P, LIVNEH A, ZEMER D, SHEMER J, PRAS M: Seronegative spondyloarthropathy in familial Mediterranean fever. *Semin Arthritis Rheum* 1997; 27: 67-72.
3. LANGEVITZ P, LIVNEH A, ZEMER D *et al.*: Seronegative spondyloarthropathy (SNSA) in familial Mediterranean fever (FMF). *Arthritis Rheum* 1994; 37 (Suppl.): S203.
4. KNOCKER DC, MALAISE IG, PEETERMANS WE: Ankylosing spondylitis. An unusual manifestation of familial Mediterranean fever. Report of a case complicated by amyloidosis and polyneuropathy. *Clin Rheumatol* 1989; 8: 408-12.
5. MAJED HA, RAWASHDEH M: The clinical patterns of arthritis in children with familial Mediterranean fever. *QJM* 1997; 90: 37-43.
6. MAJED HA, BARAKAT M: Hereditary recurrent polyserositis (familial Mediterranean fever) in children: Analysis of 88 cases. *Eur J Paediatr* 1989; 148: 636-41.
7. LEHMAN TJ, HANSON V, KORNREICH H, PETERS RS, SCHWABE A: HLA-B27 negative sacroiliitis: A manifestation of familial Mediterranean fever in childhood. *Pediatrics* 1978; 61: 423-6.
8. KHAN MA: HLA B-27 and its subtypes in world populations. *Curr Opin Rheumatol* 1995; 7: 263-9.
9. AL-ATTIA HM, AL-AMIRI N: HLA B-27 in healthy adults in UAE: An extremely low prevalence in Emirian Arabs. *Scand J Rheumatol* 1995, 24: 225-7.
10. AL-HARBI S, FOUAD F, KAABA SA: The first HLA anthropological study in the Kuwaiti population. *Eur J Immunogenet* 1994; 21: 295-300.



Fig. 1. (a) Radiograph of the pelvis showing bilateral sacroiliitis and destruction of both hip joints; (b) lateral view of the lumbar spine showing loss of lordosis and squaring of the vertebrae.