

The painful heel

Comparative study in rheumatoid arthritis, ankylosing spondylitis, Reiter's syndrome, and generalized osteoarthritis

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SUMMARY This study presents the frequency of severe and mild talalgias in unselected, consecutive patients with rheumatoid arthritis, ankylosing spondylitis, Reiter's syndrome, and generalized osteoarthritis. Achilles tendinitis and plantar fasciitis caused a severe talalgia and they were observed mainly in males with Reiter's syndrome or ankylosing spondylitis. On the other hand, sub-Achilles bursitis more frequently affected women with rheumatoid arthritis and rarely gave rise to severe talalgias. The simple calcaneal spur was associated with generalized osteoarthritis and its frequency increased with age. This condition was not related to talalgias. Finally, clinical and radiological involvement of the subtalar and midtarsal joints were observed mainly in rheumatoid arthritis and occasionally caused apes valgoplanus.

A 'painful heel' syndrome occurs at times in patients with inflammatory rheumatic disease or osteoarthritis, causing significant clinical problems. Very few studies have investigated the frequency and characteristics of this syndrome. Therefore we have studied unselected groups of patients with rheumatoid arthritis (RA), ankylosing spondylitis (AS), Reiter's syndrome (RS), and generalized osteoarthritis (OA) in order to characterize the heel tenderness (talalgia) occurring in each group and to determine its frequency. The results indicate that each disease has its particular expression in the heel of the foot.

Patients and methods

RA 100 PATIENTS

All patients had classical or definite RA according to the criteria of the American Rheumatism Association (1959). The disease had been present for more than 6 months in all of our patients and 87 had positive rheumatoid factor tests (87%).

AS 35 PATIENTS

All patients were typical and fulfilled the criteria as defined by Ogrzylo (1974). None suffered from

psoriasis, urethritis, conjunctivitis, or enterocolitis. The antigen HLA B27 was present in 29 patients (80%).

RS 16 PATIENTS

All of our patients had the complete triad (nongonococcal urethritis, arthritis, and conjunctivitis). The antigen HLA B27 was present in 12 patients (74%) and sacroiliitis in 5 (31%).

OA 70 PATIENTS

All of the patients in this group conformed to the criteria of Kellgren *et al.* (1963).

Table 1 gives the essential characteristics of these 4 groups.

Talalgia was defined as spontaneous or elicited pain either at the posterior part of the heel (along

Table 1 Patients

	No. of patients	Males/ females	Mean age (range)	Mean duration of disease (years) (range)
RA	100	31/69	59.5 (23-84)	9 (0.5-40)
AS	35	32/3	43.5 (19-75)	11.4 (1-29)
RS	16	16/0	34.8 (22-56)	5.6 (1-16)
OA	70	16/54	73.4 (56-98)	9.7 (2-40)

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the Achilles tendon and at its insertion, or in the area of the sub-Achilles bursa) or at the plantar surface (at the insertion of plantar aponeurosis on the calcaneus). Talalgia was considered to be severe when the pain occurred on weight bearing, decreased very slowly after prolonged rest, and was elicited by slight local pressure. Talalgia was considered to be mild when pain was inconsistent on weight bearing, decreased immediately with rest, and could only be provoked by moderate to marked local pressure. In each patient the presence of valgus or varus deformities of the hindfoot and of soft tissue swelling was recorded together with the articular mobility of the various joints of the foot.

A standard lateral radiograph was taken each time. When there was a suspicion of soft tissue swelling (Achilles tendon, sub-Achilles bursa, or the plantar fascia), a lateral xeroradiograph of the posterior foot was made following the technique described previously (Gerster *et al.*, 1975).

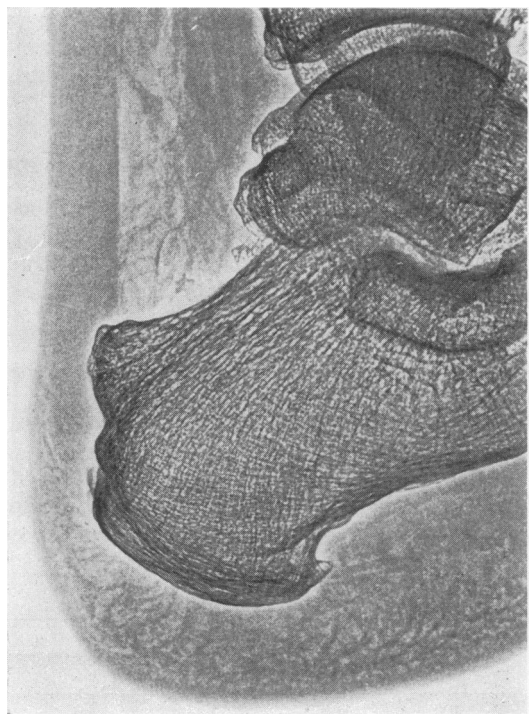


Fig. 1 Reiter's syndrome in a 45-year-old male. Xeroradiography of the right foot, showing diffuse swelling of the Achilles tendon (inferior diameter 8.0 mm, normal 5.1 ± 1.0 ; diameter of middle part 8.0 mm, normal 6.2 ± 1.6). Note a simple, regular plantar spur.

Results

The frequency of talalgias in the four groups of patients is given in Table 2. Severe talalgia was most frequent in RS, followed by AS. Mild talalgia occurred most frequently in RA. In Table 3 the clinical features of the heel are given. Achilles tendinitis was present in 8 male patients: 5 with RS (31% of the group) and 3 with AS (8.6% of the group). The 5 patients with diffuse thickening of the tendon (Fig. 1) had severe talalgia, whereas the 3 patients with nodular tendinitis (Fig. 2) had only

Table 2 Incidence of talalgia

	Severe talalgia (%)	Mild talalgia (%)
RA (100 patients)	2	27
AS (35 patients)	8.6	17.1
RS (16 patients)	31	19
OA (70 patients)	1.4	15.7

Table 3 Incidence and distribution of objective soft tissue changes

	Achilles tendinitis (%)	Plantar fasciitis (%)	Achillobursitis (%)
RA (100 patients)	0	1	4
AS (35 patients)	8.6	8.6	2.8
RS (16 patients)	31	18.7	0
OA (74 patients)	0	0	0

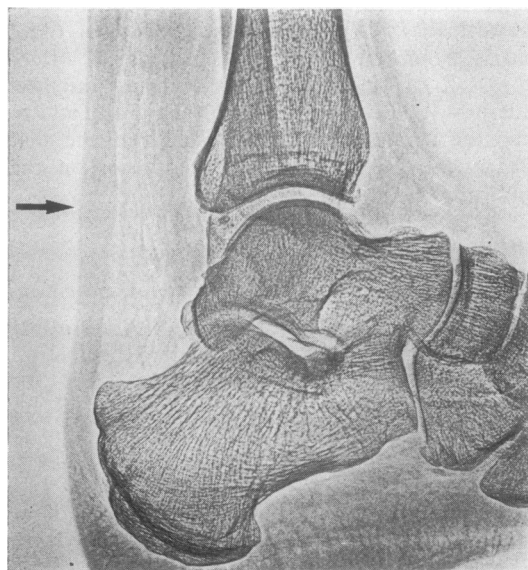


Fig. 2 Reiter's syndrome in a 37-year-old male. Xeroradiography of the right foot, showing nodular thickening (arrow) at middle part of the Achilles tendon.

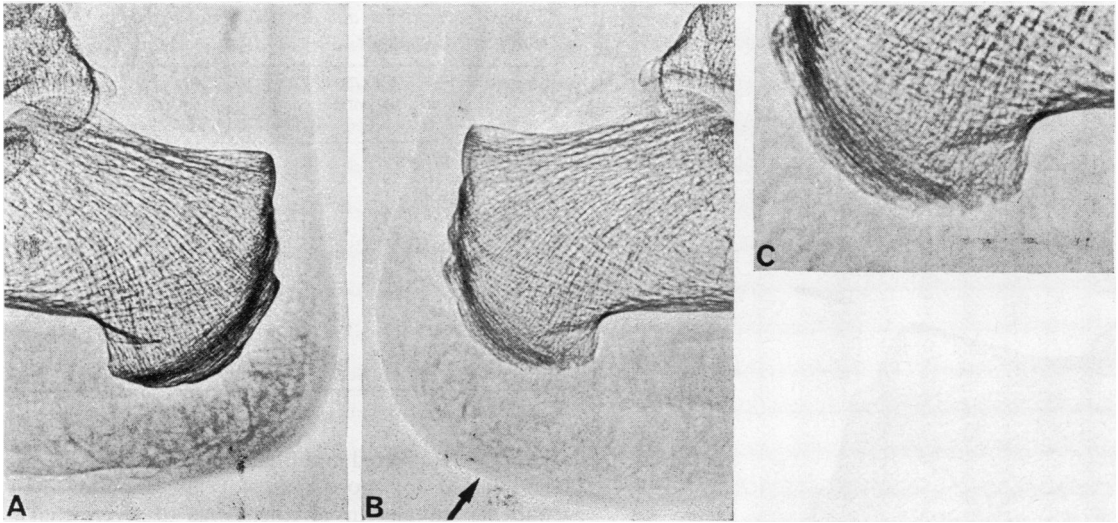


Fig. 3 Rheumatoid arthritis in a 42-year-old female. Xeroradiography of (A) left foot, (B) right foot, (C) detail of B. Note plantar fasciitis at right with thickened heel pad (arrow); the overgrowth measures 24 mm on the original xerography (normal left heel is only 19 mm). An irregular erosion is present on the plantar aspect of right calcaneus (C) and demineralization of its posterior part is visible (B)

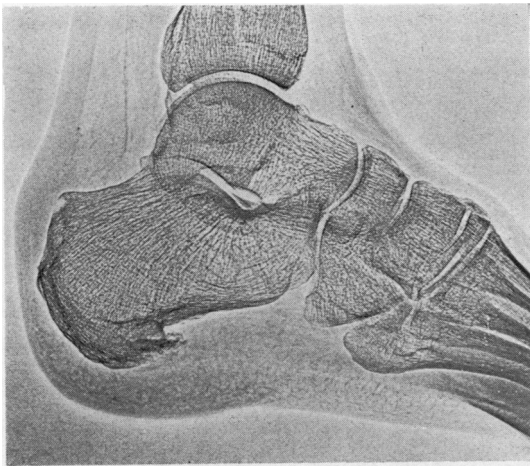


Fig. 4 Ankylosing spondylitis in a 40-year-old male. Plantar fasciitis at advanced stage, with subplantar fluffy spur. Diffuse swelling of the Achilles tendon; erosion of the sub-Achilles area.

mild talgia. Sacroiliitis was found at the same time in 6 of these patients and the antigen HLA B27 in 7 of them. In 4 patients with RS Achilles tendinitis occurred at the onset of the disease. No case of Achilles tendinitis was present in the RA or OA groups. However, painless subcutaneous rheumatoid nodules were found overlying the Achilles tendons in 3 cases of RA.

A clearly defined plantar fasciitis was seen in 7 patients: 3 with RS (18.7% of the group), 3 with AS (8.4% of the group), and one with RA. All but one patient were male and in every case the talgia was severe. Clinically the site of insertion of the plantar aponeurosis was red with a slight bulge. This bulge is clearly visible on the xeroradiographs (Fig. 3B). In early cases a subplantar erosion of the calcaneus is seen (Fig. 3C), followed later by a periosteal reaction with new bone formation giving rise to a fluffy plantar spur (Fig. 4). In 6 patients fasciitis was the first symptom of the disease or appeared simultaneously with an Achilles tendinitis. Of this group of 7 patients, 4 had sacroiliitis (57%) and in all cases except 2 (one suffering from RA) HLA B27 was present (71%).

Sub-Achilles bursitis is characterized by a fluctuating tender mass bulging to the sides of the tendon. This was seen in 5 patients, 4 females with seropositive RA and one male with AS. The bursitis was accompanied by a mild talgia. At an early stage the xeroradiographic image shows a depression on the anterior surface of the Achilles tendon above its calcaneal insertion caused by the enlarged sub-Achilles bursa (Fig. 5). Later an erosion appears at the same site on the upper margin of the calcaneus (Fig. 6). There seems to be a marked tendency for the pre-Achilles bursitis seen in RA to heal spontaneously. When the tenderness and swelling disappear, radiography shows a new periosteal bone formation on the posterosuperior part of the calcaneus (Fig. 7) without any functional disturbances.

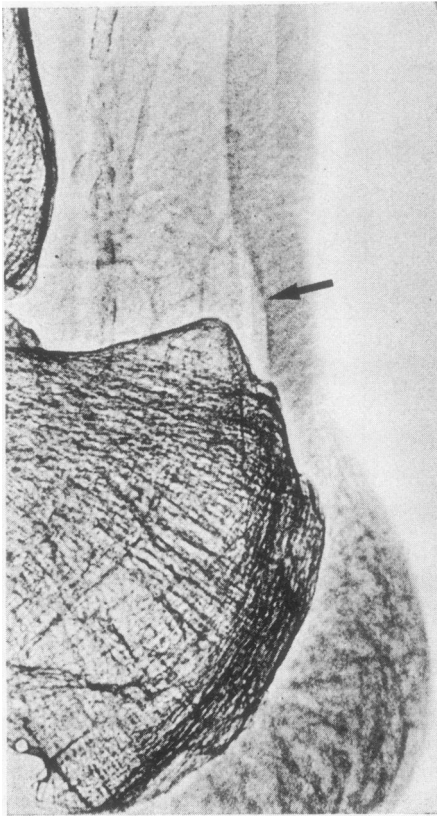


Fig. 5 Xeroradiography of the left foot of a 55-year-old female with rheumatoid arthritis. Active sub-Achilles bursitis with an impression on the anterior part of the Achilles tendon (arrow).

The incidence and distribution of the osseous changes on x-rays are presented in Table 4. A simple calcaneal spur with well-defined borders was frequently seen in the group with OA. Frequently the spurs are bilateral and occur more often on the plantar surface than on the posterior surface of the calcaneus. Except in RS, these simple spurs are generally present in patients over 60 years of age. Irregular calcaneal spurs are most frequently seen on the plantar surface and represent the natural evolution of a fasciitis. Occasionally they are found on the posterior pole of the calcaneus and are the result of an Achilles tendinitis. Thus, the incidence of such irregular spurs is greatest in adults with RS or AS.

As expected, the radiological changes of the subtalar articulations, frequently associated with changes in the midtarsal joint, were most often seen in RA. In 38% of the patients in this group the tarsal

Table 4 Incidence and distribution of osseous radiological changes

	RA (100 patients) (%)	AS (35 patients) (%)	RS (16 patients) (%)	OA (70 patients) (%)
<i>Calcaneus</i>				
Simple spur	20	17	18.7	56
Irregular spur				
Posterior	2	2.8	0	0
Plantar	2	11.4	18.7	0
Erosion				
Posterior	6	5.7	6.2	0
Plantar	1	2.8	6.2	0
Involvement of subtalar joint	27	2.8	0	17.1
Involvement of midtarsal joint	23	2.8	6.2	15.7

joints were affected and in all but 4 cases the disease had lasted for more than 4 years. In 5 of these patients subtalar involvement was so severe that it caused a painful valgoplanus deformity of the foot. This condition was found only once in the other groups (a patient with OA). We did not observe a distinct clinical correlation between tarsal involvement and the presence of talalgia in any of the groups.

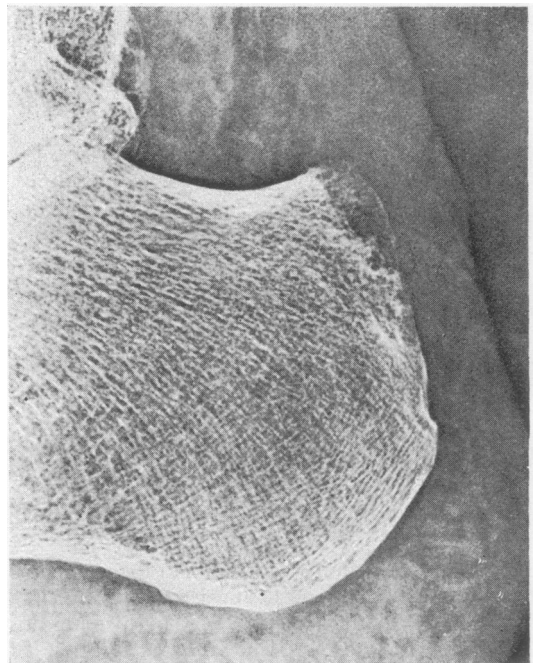


Fig. 6 Rheumatoid arthritis in a 57-year-old female. Erosion of the upper margin of calcaneus from active sub-Achilles bursitis—negative xeroradiographic picture.

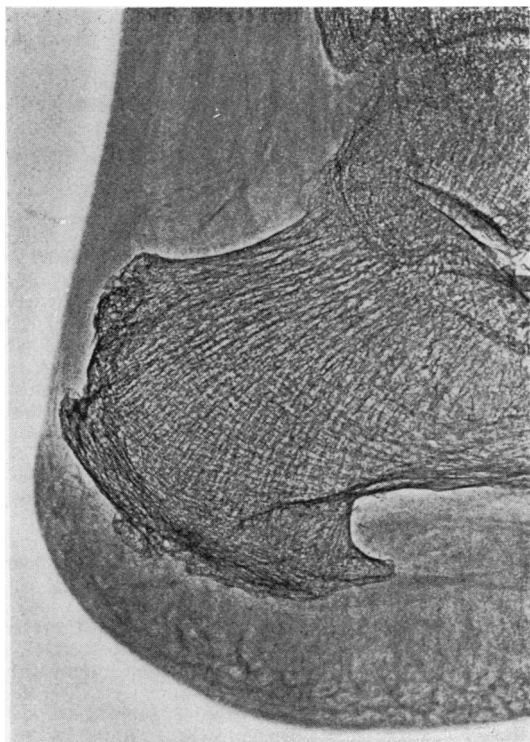


Fig. 7 Rheumatoid arthritis in a 66-year-old female. Healed achillobursitis with rem mineralization and new bone formation on the posterior aspect of the calcaneus.

Treatment

In all the cases with severe talalgia it was necessary to relieve the painful areas of weight bearing by orthopaedic semi-rigid heel cups, made of leather with a cork and latex filling, or appropriate shoes. Besides anti-inflammatory oral medication, local injections of steroids at trigger points were used and frequently helped to relieve symptoms. In certain cases it was necessary to repeat the injections at approximately 2-week intervals. The severe forms of talalgia recurred often (in approximately 3/4 of the cases) requiring the repetition of the treatment. In cases of Achilles tendinitis resistant to all treatment, anti-inflammatory radiotherapy caused remarkable relief of pain.

Discussion

Talgia may contribute a major part to a patient's disability and discomfort. This is particularly true in RS where one-third of our patients had severe talgias. Often talgias were the first symptom, as

described earlier by others (Ford, 1953; Brousse *et al.*, 1966). Talalgias were also frequently seen in AS.

The clinical lesions of the heel encountered in our study were Achilles tendinitis, plantar fasciitis, and sub-Achilles bursitis. As a consequence of these inflammatory processes, erosions of the os calcis, periosteal new bone formation, or irregular spurs may result. Achilles tendinitis occurred either in the form of a diffuse thickening of the tendon or in the form of a nodular thickening. The nodular thickening might, however, be due to other causes: gouty tophi, xanthomas (Gerster *et al.*, 1975), or subcutaneous rheumatoid nodules overlying the Achilles tendon. For the purposes of differential diagnosis, so-called 'nodular tendinitis' (Auquier and Siaud, 1971) should be considered. This is a traumatic condition where the nodule represents scarring secondary to a small, incomplete tendon rupture.

Plantar fasciitis, sometimes associated with Achilles tendinitis, was again found in RS and AS, and in only one case of seropositive RA. This latter patient was a female and the HLA B27 antigen was absent; plantar fasciitis was the main symptom of her disease. The presence of plantar fasciitis in RA seems to be rare but has been described before (Bywaters, 1954; Calabro, 1962). The fluffy plantar spurs are a consequence of plantar fasciitis and thus are mainly seen in RS or AS (Mason *et al.*, 1959).

Both Achilles tendinitis and plantar fasciitis seem therefore to be directly related to the seronegative arthropathies such as AS and RS and to the male sex. A relation also seems to exist with the involvement of the sacroiliac joints (2/3 of our cases) and the presence of the antigen HLA B27 (3/4 of our cases). Sub-Achilles bursitis was found most frequently in women with RA. Unlike Achilles tendinitis and plantar fasciitis, achillobursitis rarely caused severe talalgia and had a marked tendency to heal spontaneously (Bywaters, 1954). The 4% incidence in our group suffering from RA is similar to the results reported by Vainio (1956).

Synovial joints of the tarsus (subtalar and mid-tarsal joints) were often involved in rheumatoid arthritis (38%), as reported before (Calabro, 1962; Braun, 1975; Vidigal *et al.*, 1975). The development of a severe valgus heel deformity in these cases is noteworthy as Dixon (1971) has emphasized, 'Severe valgus deformity at the subtalar joint is the most characteristic change of the hindfoot in late rheumatoid arthritis'. In our study no correlation could be found between talalgia and involvement of the subtalar and midtarsal joints.

Simple spurs, with well delimited margins were seen, especially in the group suffering from OA; the incidence of the spurs increased with age as reported by Bassiouni (1965). We would like to emphasize

the absence of a clinical correlation between the simple spur and talalgias in our groups; this is in agreement with observations made by Serre *et al.* (1968).

In many patients with inflammatory or degenerative joint diseases suffering from mild talalgias a special cause could not be determined and xero-radiography failed to show any soft tissue changes in this study. It seems that minor inflammatory processes exist at the calcaneal insertion of the plantar fascia or Achilles tendon which cannot be shown. These processes could be assimilated into the larger group of ligamentous attachment anomalies called 'enthesopathy' (Niepel *et al.*, 1966).

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