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EROSIVE OSTEOARTHRITIS OF THE DISTAL FINGER JOINTS

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Degenerative changes in distal finger joints may be part of a generalized rheumatoid arthritis (Jones 1909, Bauer et al. 1941). According to McCarthy & Gatter (1966) there is widespread acceptance that the distal interphalangeal joints are rarely involved in rheumatoid arthritis. McCarthy & Gatter further investigated this by studying 33 patients with established rheumatoid arthritis, and contrary to the accepted view found that the distal joints were frequently inflamed. Seventy per cent of the patients had tenderness of the distal interphalangeal joints.

Still, there is some uncertainty as to how a classification should be made of tender, swollen distal finger joints which on X-ray show osseous destructions and eroded cartilage. Clinically there is a resemblance to rheumatoid arthritis, but laboratory findings fail to give satisfactory proof of this condition and no other joint involvement can be demonstrated (Peter et al. 1966, McEwen 1968, Radi 1970).

An intermediate opinion was presented by Crain (1961) who described 23 patients with interphalangeal osteoarthritis, which he defined as a "localized form of arthritis involving the finger joints characterized by degenerative changes with intermittent inflammatory episodes leading eventually to deformities and ankylosis". Sedimentation rate was normal and rheumatoid factor absent.

Further studies by Peter et al. (1966), including histologic analysis of specimens from 6 patients with degenerative disease of both proximal and distal finger joints, disclosed that synovium from these joints resembled that of rheumatoid arthritis much more closely than that of chronic osteoarthritis. In view of negative serologic tests Peter et al. suggested the term "erosive osteoaorthritis" to be used for this condi-

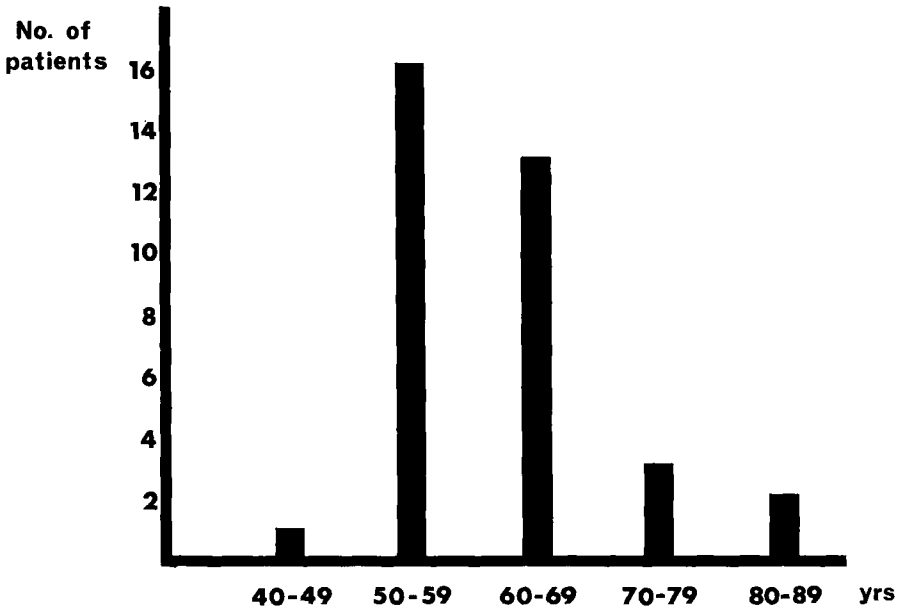


Figure 1. Age distribution of patients with erosive osteoarthritis of the distal interphalangeal finger joints. Females only.

tion, as cartilage destruction, juxta-articular erosions and osteophyte formation were so predominant.

Based on a study of 15 patients, Fellman (1967) regarded the interphalangeal lesions as part of rheumatoid arthritis.

McEwen (1968) reported 4 patients with something that looked like Heberden's nodes but which progressed to erosive osteoarthritis, resulting in bony ankylosis of some of the distal joints.

In 1970 Radi presented a thesis on erosive osteoarthritis of the interphalangeal joints. Twenty-one patients were studied and he suggested the term dactylosis, as the changes observed could be compared with those in the intervertebral joints in cases of spondylarthrosis or spondylosis. Radi did not believe that the dactylosis was part of a generalized osteoarthritic process, but rather more a local phenomenon.

The presence of Heberden's nodes should be mentioned in this context. These swellings on the dorsal aspect of the distal interphalangeal joints have been accepted as part of degenerative phenomena in the joint structures. Very often this is also the case. Heberden's nodes can, however, appear without any particular affinity to the joint and then present as a collection of highly polymerized

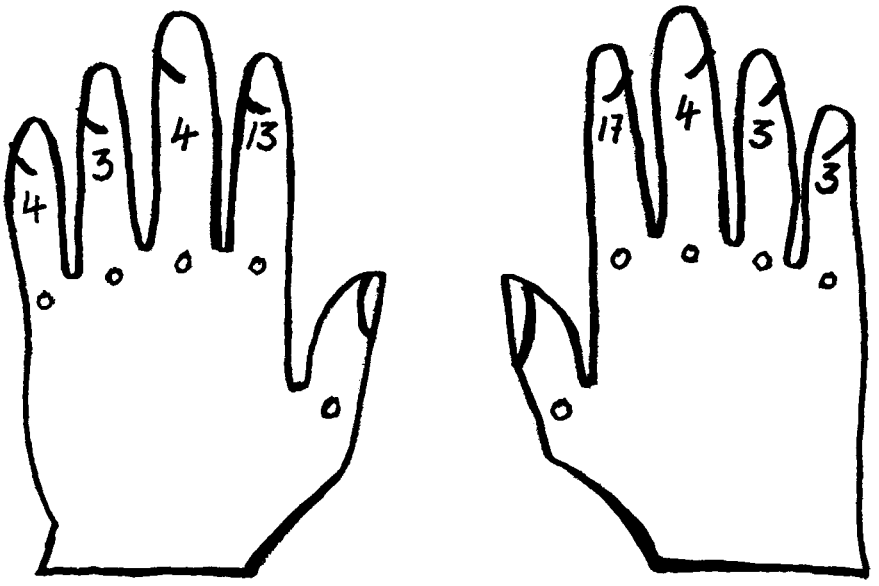


Figure 2. Frequency of involvement of hands and distal finger joints in 35 patients with erosive osteoarthritis.

hyaluronic acid. In the condition mentioned—erosive osteoarthritis—Heberden's nodes can be present but need not necessarily be so.

There is thus a difference in the interpretation of the background for degenerative changes in the distal interphalangeal joints. Little has so far been reported on this condition, but attention has been focused on rheumatoid arthritis and advanced osteoarthritis respectively. For this reason the following study has been carried out to further investigate the pathomorphologic appearance in advanced degenerative disease of the distal interphalangeal joints.

MATERIAL AND METHODS

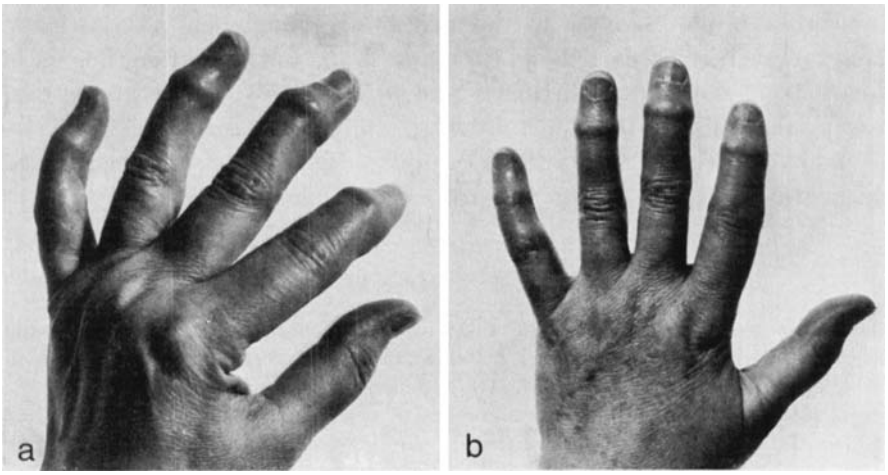
During the years 1969 and 1970 a total of 35 patients have been collected and observed. All were women. The age distribution was between 83 and 44 years with an average age of 60 (Figure 1). All patients who complained of pain in the distal interphalangeal joints or who presented with Heberden's nodes or who had deformities of the distal joints had their hands X-rayed and the following blood tests carried out: hemoglobin, RBC's WBC's, differential count, sedimentation rate, rheumatoid tests and uric acid.

Twenty patients who had shown signs of degenerative disease both clinically

and on X-ray were operated with a synovectomy. The distal joint was approached by a transverse dorsal incision. The extensor tendon was freed and the joint opened on either side of the tendon. The synovium was removed and sent for histologic preparation. The skin was closed with loose steel wire sutures. Mobilization was permitted as soon as the patient could move her fingers. The histologic preparations were stained with hematoxylin-eosin and van Gieson. The histologic study was carried out both by a pathologist and by the author.

RESULTS

Clinical: Only distal interphalangeal joints were involved. In 15 patients there was two-handed involvement, in 20 one-handed, i.e. 50 hands. In the one-handed group the right hand was involved in 11 and the left in 9. Mostly the 2nd finger was involved in all groups but both the 3rd–5th fingers could be the site of degenerative change (Figure 2). No proximal interphalangeal joints were involved. In 11 patients Heberden's nodes were encountered: in one hand in 5 patients belonging to the two-handed group, in both hands in 2 patients and in 4 of the one-handed group (Table 1). All Heberden's nodes were associated with degenerative articular change (Figures 3 and 4). All patients complained of pain both at rest and in motion. All complained of swelling and stiffness. Those with Heberden's nodes suffered most from the cosmetic appearance which was experienced as very disturbing. Slight crookedness was seen in some joints. In the younger patients



Figures 3 a and 3 b. Heberden's nodes in left hand of 54-year-old female. No other joint involvement.

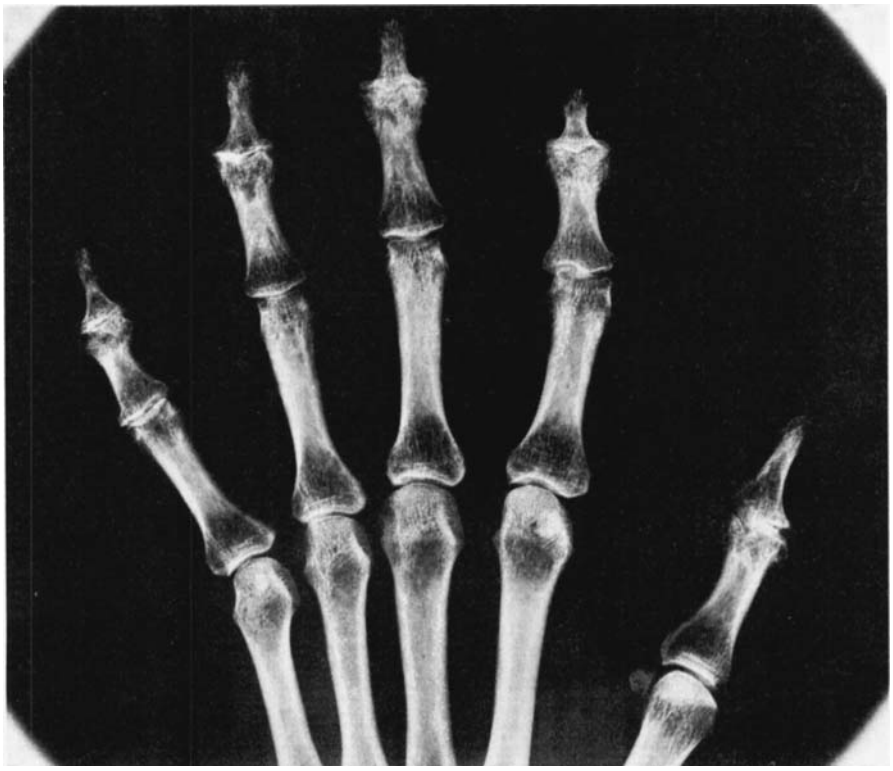


Figure 4. X-ray of same hand as in 3 a and b. Note small cysts and articular erosions in DIP-joints.

there was no limitation in the range of motion, whereas in the elderly this was markedly decreased and in 2 patients (67 and 75 years respectively) there was complete ankylosis. The joints were occasionally slightly tender to touch and motion could produce pain. There was no increase in heat in any joint examined.

Table 1. Frequency of Heberden's nodes.

One-handed group:		4
Two-handed group:	one hand	5
	two hands	2

Laboratory investigations: All tests were normal except in 5 patients who had an increase in sedimentation rate.

X-ray examination: Characteristic findings were a decrease in the

Figure 5. X-ray of right hand in 56-year-old female. Erosive osteoarthritis of DIP-joints, second finger.

cartilage height and erosions in the bone cartilage zone. Rarefaction was common and small subchondral cysts were encountered (Figures 4 and 5). Periosteal elevations on the joint borders were common. Occasionally subluxation of a minor degree was observed.

Histology: In all cases the synovial tissue revealed very discrete changes. There were no villi. The synovial surface in 5 cases was covered with a thin layer of fibrin. Hypertrophy of synoviocytes was limited to irregularly scattered small regions. Large strands of collagenous tissue were frequently seen. There was no massive polymorphonuclear cell infiltration but occasional leucocytes were observed irregularly scattered. Nodular infiltrates of plasma cells and lymphocytes, which are a morphological hallmark in rheumatoid disease, were not encountered in any single case. On the whole the synovial tissues

were richly vascularized and in some instances tufts of vessels similar to what can be seen in granulation tissue were encountered. No bone or cartilage were submitted for histologic study (Figure 6).

Treatment

There is no specific treatment for this disease. Therapy therefore becomes symptomatic. The use of analgesics and anti-inflammatory agents have a temporary effect. In this series of patients synovectomy was done as the patients complained of troublesome swelling and stiffness of the joints. Often, however, symptoms are so slight that treatment often becomes superfluous. Follow-up after 2 years revealed that all operated patients no longer had any swelling but occasionally stiffness was experienced. In the remaining patients salicylates were used and ergonomic advice offered.

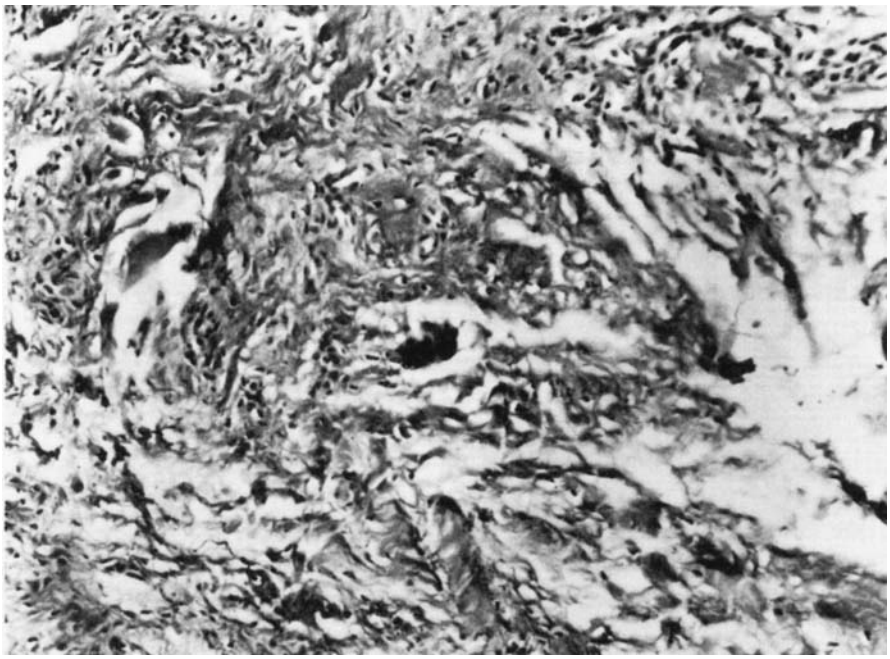


Figure 6. Histologic section of soft articular tissue from DIP-joint of forefinger from patient in Figure 5. There is round cell infiltration. No plasma cell nor lymphocyte infiltrates. Numerous vessels. H. and E. × 255.

DISCUSSION

It has become evident from this investigation that a form of degenerative disease exists which, once established in the distal finger joints, has features common to both rheumatoid disease and osteoarthritis. On perusing the literature it appears that many authors belive in a relationship to rheumatoid arthritis (e.g. Peter et al. 1966, McEwen 1968) though definite evidence for this assumption is lacking. The histologic report of Peter and co-workers (1966) exposes close similarities to the morphologic appearance of rheumatoid synovium. It should, however, be stressed that those findings—plasma cell and lymphocyte infiltrates—characteristic as they are of rheumatoid disease are in no way pathognomonic but rather an expression of the inflammatory state found in any chronic condition. This investigation disclosed structural changes of the synovium compatible to chronic inflammation. There was no indication of any relationship to rheumatoid arthritis in the presented cases.

On the other hand, it is surprising that the osteoarthritic process in the digital joints discloses such a devastating activity that erosions develop in the bone cartilage zone. This is something often observed in rheumatoid arthritis and the X-ray appearance of the two conditions is very similar. As a matter of fact, the erosive osteoarthritis resembles rheumatoid bony destructions more than osteoarthritic. The possibility of a rheumatoid equivalent cannot therefore be totally excluded.

In this investigation the tests for rheumatoid factor were negative. In Radi's investigation (1970) all 21 cases were sero-negative for rheumatoid arthritis. The same has been encountered in other reports (Crain 1961, Peter et al. 1966, McEwen 1968). This in itself does not exclude the possibility of a rheumatoid agent being active in the development of the digital destructions but does not on the other hand give the concept any strength. The normal sedimentation rate also favours the concept of the disease being benign despite its aggressive tendency in the local joint situation.

Finally, the clinical course is much milder than that of rheumatoid arthritis and despite a few cases described of final ankylosis this development must be regarded as an exception.

The term erosive osteooarthritis is no doubt very descriptive, but Radi (1970) has suggested the term dactylosis. He has made a comparison to other osteoarthritic changes in the joint system—especially

the intervertebral joint—and in consequence of the commonly used expression spondylosis found it natural to call osteoarthritis of the finger joints dactylosis. Considering the aggressive appearance as demonstrated both in X-ray and histology, it nevertheless seems appropriate to use the term erosive osteoarthritis suggested by Peter et al. (1966) as this clearly gives a distinction of the condition from both rheumatoid arthritis and those forms of osteoarthritis which are commonly seen in other joints.

SUMMARY

A report is given of 35 patients with osteoarthritic changes in the distal finger joints. The morphologic features are those of a chronic inflammation. The X-ray findings disclose bony erosions similar to rheumatoid arthritis. There is no indication that any relationship exists to rheumatoid disease. Due to the aggressive appearance of joint changes erosive osteoarthritis seems an appropriate name for the condition. It is easily treated with analgesics and anti-inflammatory agents. Ankylosis can develop but on the whole the prognosis is good.

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