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Thiemann's finger or toe disease

Follow-up of seven cases

Thiemann's disease is a non-inflammatory disorder of unknown etiology, affecting the epiphyses of the phalanges of the fingers and the first toe in children. We have re-examined seven patients after up to 18 years. Two patients had had pain in the affected digits for several years. In four patients radiographs after closure of the growth plates showed normal phalangeal dimensions without arthrosis. We conclude that different degrees of severity of epiphyseal disturbance consistent with the type described by Thiemann may be encountered. It is possible that trauma may worsen the prognosis by deformation of a susceptible epiphysis.

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Thiemann's disease (1909) is a rare disorder of the immature epiphyses of the fingers and toes. The clinical symptoms usually appear in adolescence or puberty, although they have also been reported to start in adulthood (Rubenstein 1975).

Typically, the disorder begins in the middle finger, affecting the epiphysis of the intermediary phalanx, and may later involve the adjacent fingers symmetrically (Sundt 1936, Iversen 1956, Melo-Gomes et al. 1981). The principal clinical manifestation is fusiform swelling and tenderness of the affected joint. Pain, if present, is usually slight and may be aggravated by coldness.

The radiographic changes in the affected epiphyses are sclerosis, flattening, cup-shaped widening and eventually fragmentation or irregular trabecular opacity (Sundt 1936, Franck 1942, Geidion 1976, Melo-Gomes et al. 1981). The metaphysis may be broadened and show retarded physeal growth. The radiographic changes recede after a variable period, leaving the mature phalanx normal apart from some widening and shortening. The joint space is unaffected unless arthrosis supervenes.

There is a characteristic disproportion between the often inconspicuous clinical findings and the more dramatic radiographic disturbance (Sundt 1936, Trippel 1950, Melo-Gomes et al. 1981). We have studied to what extent radiographic changes in the phalangeal epiphyses of the type described above are associated with symptoms at the time of diagnosis or in maturity, and whether such changes can cause permanent deformity.

Patients and methods

Nine patients with typical radiographic abnormality of the epiphyseal phalanges were identified through a review of the Odense University Hospital Radiologic Department records from 1956 to 1984. Two patients were excluded, one because he was lost to follow-up and the other because the affection primarily involved the distal epiphyses of the metacarpal bones (Dietrich's disease).

The remaining seven patients, four male and three female, mean age at time of diagnosis 11 (9–13) years were re-examined and radiographs of both hands and feet were obtained. A complete history of past and present symptoms was obtained. Hereditary and general health status were assessed. The fingers and toes were examined for deformity, swelling, tenderness and restricted movement. The radiographs were studied for signs of deformity, shortening, widening, and arthrosis.

Results

In four patients only the basal epiphyses of both first toes were affected. In all of these patients the radiographs showed sclerosis, in one widening and in one fragmentation on the right side after trauma (Figure 1). Three of them, re-examined before closure of the growth plate shortly after diagnosis, reported only a few days of tenderness and swelling of

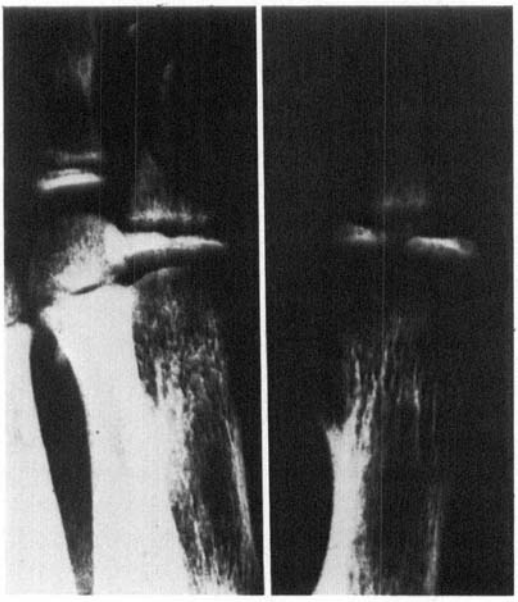

Figure 1. Sclerosis and fragmentation of the proximal epiphyses of the right toe.

the metatarsophalangeal joints of their first toes.

The fourth patient, re-examined 12 years after diagnosis, reported tenderness and periodic swelling of the toes. The clinical examination revealed tenderness and slightly reduced dorsiflexion in the metatarsophalangeal joints of the first toes.

In two patients the disorder was noted coincidental to radiographic examination after trauma. The radiographs showed sclerosis of the distal epiphyses of both fifth fingers and the right second finger in one, and sclerosis and narrowing of the epiphysis of the fifth middle phalanx in the other. At re-examination both patients reported that, apart from the trauma episodes, they had never noticed inconvenience from their digits.

The last patient had sclerosis, narrowing and cup-shaped widening of the middle epiphysis of the left third finger (Figure 2) at the age of 13. Four years later, at re-examination, she reported that she had suffered from periodic swelling and tenderness of the proximal interphalangeal joint, aggravated by coldness.

The four patients who were re-examined in maturity had normal phalanges without signs of arthrosis.

Discussion

Only one of our patients had the disorder in the typical localization of the third finger, and in the majority only the first toe was affected. This difference may be attributed to the selection of the cases.

Our cases had relatively mild radiographic changes; only one had fragmentation, and two widening of the epiphyses. The clinical course also seemed less severe than the cases reported in the literature, in which, apart from the case of Iversen (1956), most had complaints of several years' duration (Sundt 1936, Trippel 1950). Our observations suggest that different degrees of severity can be found in the epiphyseal affection of the phalanges described by Thiemann (1909).

The etiology is unknown. Dessecker (1930) examined an affected epiphysis histologically

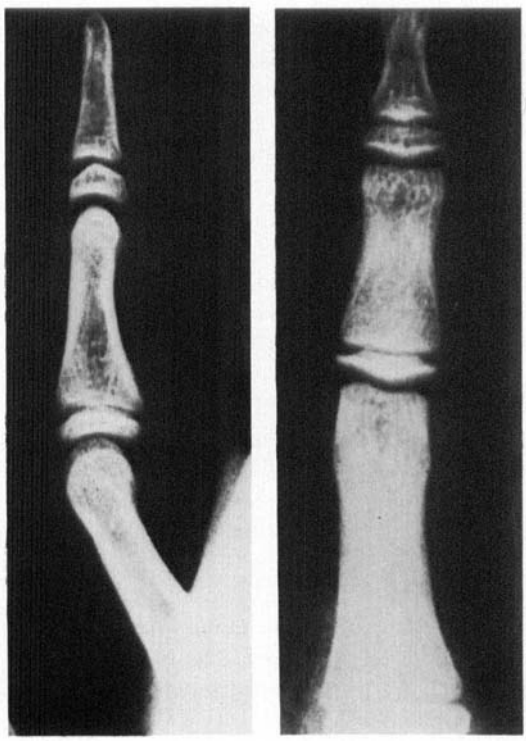

Figure 2. Sclerosis, cup-shaped widening and flattening of the middle epiphyses of the third finger.

and found necrosis without inflammation. The non-inflammatory nature of the condition is supported by the normal laboratory findings, notably the white blood count and sedimentation rate (Franck 1942, Cullen 1970, Malloy & Hamilton 1978, Melo-Gomes et al. 1981). Until recently most authors classified Thiemann's disease as a juvenile osteochondritis, comparing it with diseases like Calvé-Perthes, Kienböck, Scheuermann, etc. (Sundt 1936, Franck 1942, Cullen 1970). Spanger (1976) considered it an epiphyseal dysplasia and Geidon (1976) an acrodysplasia.

The incidence of Thiemann's disease is unknown. The scarcity of reports in the literature has led to a general acceptance that it is a rare condition. This may also be a product of failure in diagnosis (Cullen 1970). We found three cases during the period of our study.

The role of trauma is undetermined. Although regarded as a spontaneous or idiopathic disorder, in accordance with the clear hereditary pattern (Trippel 1950, Rubenstein 1975, Melo-Gomes et al. 1981), cases have been reported in which the symptoms began after trauma (Sundt 1936, Cullen 1970). Franck (1942) suggested that trauma could cause a disturbance of the vascularization of the epiphyses. One of our patients developed the disturbance after two injuries to the affected finger. The rarity of the condition would exclude trauma as the sole cause.

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