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Case Report

Phalangeal microgeodic syndrome in children: a report of one case

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Abstract: Microgeodic phalangeal syndrome is a rare self-limiting condition which affects only children. No systemic findings have been reported in association with it. We herein describe a rare case of phalangeal microgeodic disease in a 13-year-old boy. Blood cell count and erythrocyte sedimentation rate were within normal limits. The clinical symptoms regress within 6 months and radiographic changes return almost to normal without any treatment.

Keywords: Microgeodic phalangeal syndrome, radiographic change

Introduction

The term microgeodic was coined because of the occurrence of small radiolucent spots approximately 1 mm in diameter in the radiographs. A geode is defined as a hollow usually spheroidal rock with crystals lining the inside walls. Microgeodic disease is a rare clinical condition first described by Maroteaux in 1970 [1]. It usually occurs in winter and presents as sub-acute swelling of the fingers. There is often some local erythema over the swellings which are tender. There is a predilection for the middle phalanges and several fingers may be affected at the same time. There is some loss of movement of the neighboring joints, although this is not usually too severe. No associated systemic findings have been described and all routine blood tests are normal.

Radiographically, the affected phalanges show a mixture of osteolysis and osteosclerosis, with periosteal reactions in some cases. In most cases, the condition can be diagnosed by clinical and radiographic findings, and does not require biopsy or surgical treatment [2-10].

The prognosis of patients with phalangeal microgeodic syndrome is excellent. The clinical symptoms regress within several months and radiographic changes return almost to normal without any treatment. The pathogenesis of microgeodic phalangeal syndrome is suggested to be a transient disturbance of the peripheral circulation caused by cold temperatures.

In this report we describe a rare case of phalangeal microgeodic disease.

Case report

A 13-year-old boy presented with a 2-week history of mild swelling and pain in the right second toe with no history of trauma. Physical examination revealed fusiform swelling, local heat, redness, and mild tenderness over the middle phalanx of the right second toe (**Figure 1**). Range of motion of the distal and proximal interphalangeal joints in the second toe was restricted slightly in flexion only by the swelling. The patient was afebrile. Laboratory data including blood cell count and erythrocyte sedimentation rate were within normal limits. Initial radiographs of the foot showed mild osteosclerosis with cortical irregularity in the diaphysis of the middle phalanx of the right second toe (**Figure 2**). No periosteal reaction was observed. The radiographic differential diagnoses included osteomyelitis, bone tumors, and microgeodic phalangeal syndrome. The characteristic clinical manifestations and radiographic features, and negative inflammatory

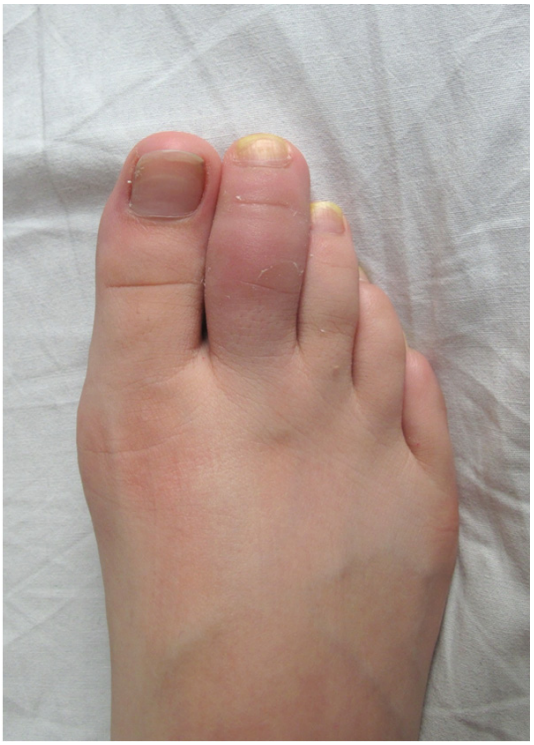

Figure 1. Picture of phalangeal microgeodic syndrome in a 13-year-old boy.

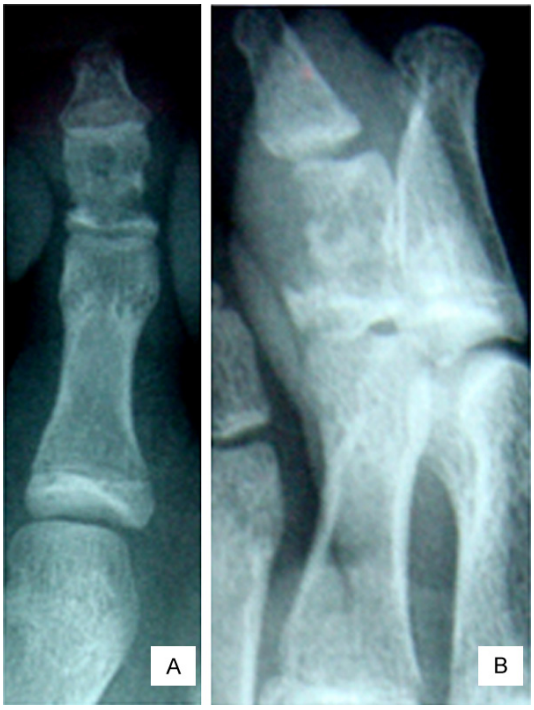

Figure 2. Initial radiographs of the middle phalanx of the right second toe.

signs in the laboratory data suggested the diagnosis of phalangeal microgeodic syndrome. The patient subsequently was followed up without any treatment. At follow-up 3 weeks later, there was slightly decreased swelling and pain in the toe, and radiographs of the finger showed shortening of the phalanx and wide osteolytic areas adjacent to the growth plate (**Figure 3**). These slowly regressed and 6 months later the bone radiograph appeared normal.

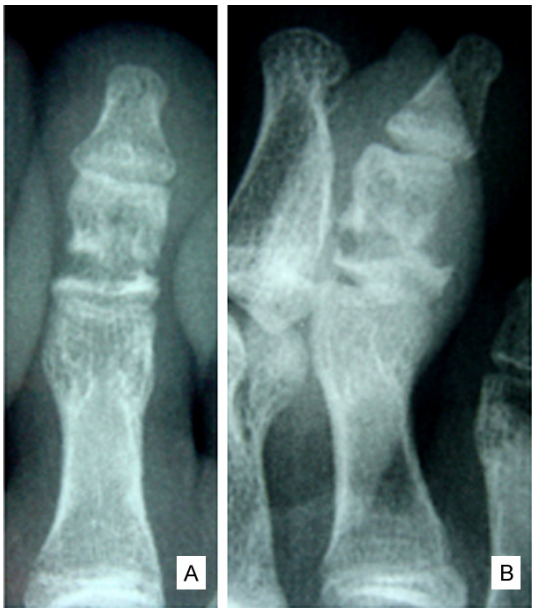

Figure 3. Radiographs of the middle phalanx of the right second toe, 3 weeks later. Compared to 3 weeks ago, the radiographs showed that the phalanx was shortened, and osteolytic areas adjacent to the growth plate was widened.

Discussion

Microgeodic phalangeal syndrome is a rare self-limiting condition which affects only children. No systemic findings have been reported in association with it. It appears to be due to infarction of the bone followed by repair with new bone formation [7, 9, 11]. In previous reports, the disease has been shown to appear almost exclusively in children during the winter months [4-8]. Patients with this disease complain of frostbite-like symptoms such as pain and swelling in the affected phalanx. Radiographs show an irregular appearance consisting of sclerosis and multiple small radiolucent spots. Differential diagnosis of this condition includes osteomyelitis, tuberculosis, sarcoidosis, syphilis, parathyroid dysfunction, complex regional pain syndrome, and malignant bone neoplasms [8]. However, microgeodic disease can be differentiated from other

diseases based on its characteristic clinical and imaging findings and otherwise normal results in tests.

The precise etiology is still unknown. Most of the cases occurring sporadically and in wintertime lead some authors to think that this syndrome might be caused by circulatory disturbances in the phalanges exposed to low temperatures [4, 9]. However, this hypothesis is doubtful for the case of Meller et al [7] occurring in wintertime, in Israel, where winter is very mild and for several European cases occurring in summer [1, 6]. Infectious agents such as para-influenza and hepatitis A virus have been suspected by Sato K et *al* [8].

Normal white-blood cell count and lymphocyte count have been noticed, as in our case, however the viral infection may not be casual. We feel that a biopsy and culture for the presence of fastidious organisms may help elucidate the nature of the condition and greatly assist in therapeutic decisions.

Acknowledgements

This study was approved by the Dalian Medical University Ethics Committee. Verbal informed consent was obtained from the 13-year-old boy's guardians. All procedures have been approved by China Ethics Committee and performed in accordance with the ethical standards. This study was supported by National Natural Science Foundation of China (No.: 30973066).

Disclosure of conflict of interest

None.

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