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CASE REPORT

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A case of pachydermoperiostosis associated with arthritis

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Abstract Pachydermoperiostosis (PDP) is characterized by clubbing fingers, furrowing of the facial skin, and periosteal hypertrophy. We report a case of a patient with PDP associated with severe arthritis of the knee and ankle joints. His serum C-reactive protein (CRP) levels were increased, and an analysis of serum and synovial fluid showed high levels of interleukin-6. These findings mean that there is some difficulty in distinguishing the disease from rheumatoid arthritis. While treatments such as nonsteroidal anti-inflammatory drugs, steroids, and colchicine were not particularly effective, the severe arthralgia was gradually relieved over a few years.

Key words Arthritis · Clubbing fingers · Pachydermoperiostosis (PDP)

Pachydermoperiostosis (PDP) was first described in 1935.[1] The symptoms were digital clubbing, periostosis, and hypertrophic skin changes. Although the disease is sometimes a complication of arthritis, few abnormal inflammatory signs have been demonstrated in serum and synovial fluids. It has been reported that the arthralgia in PDP does not originate from synovitis, but rather is caused by active inflammation of the periosteum.[2] However, some cases show swelling of the joints with synovitis and joint effusion, suggesting nonspecific arthritis. In this study, we report a case of a patient with PDP complicated by severe arthritis, and describe the inflammatory markers in the serum and synovial fluid of the patient.

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Case report

An 18-year-old man who had been affected with severe pain in both knee and ankle joints for 3 months visited the hospital. There was no relevant family history. On physical examination, clubbing of the fingers and toes was found, and there was marked furrowing of the skin on the scalp (cutis verticis gyrata) and face, as well as seborrhea on the face (Fig. 1). These abnormal findings had developed from about 17 years old. Swelling and local joint heat were seen in both knees and ankles. Radiological examination showed that periostosis of the diaphysis of the radius, ulna, tibia, and fibula was present, while no abnormal findings were shown in the knee or ankle joints or in the hands (Fig. 2). A chest X-ray film was normal. At the first examination, his hemoglobin was 14.7 g/dl, leukocyte count $8.4 \times 10^3/mm^3$, and platelets $3.85 \times 10^5/mm^3$. Serum calcium, phosphorus, alkaline phosphatase, and uric acid were normal. Rheumatoid factors, antinuclear factors, and lupus erythematosus cells were negative, and C-reactive protein (CRP) was 2.33 mg/dl (normal <0.23 mg/dl). Growth hormone level in serum was 2.1 ng/ml (normal <5 ng/ml). Because of these characteristic findings, we diagnosed this patient as a complete type pachydermoperiostosis. Despite treatment with a nonsteroidal anti-inflammatory drug (NSAID), his arthralgia did not improve. Three months later, we aspirated a small amount of joint effusion from the knee, which was clear and yellowish. We then measured interleukin-6 (IL-6) levels in serum and synovial fluid with an enzyme-linked immunosorbent assay (ELISA) kit (BioSource International, CA, USA). There were 8.61 pg/ml and 455 pg/ml, respectively. At the same time, the CRP level in serum was also measured and found to be 4.71 mg/dl. NSAID, prednisolone, and colchicine were not particularly effective. The arthralgia continued for a few years, and then subsided gradually.

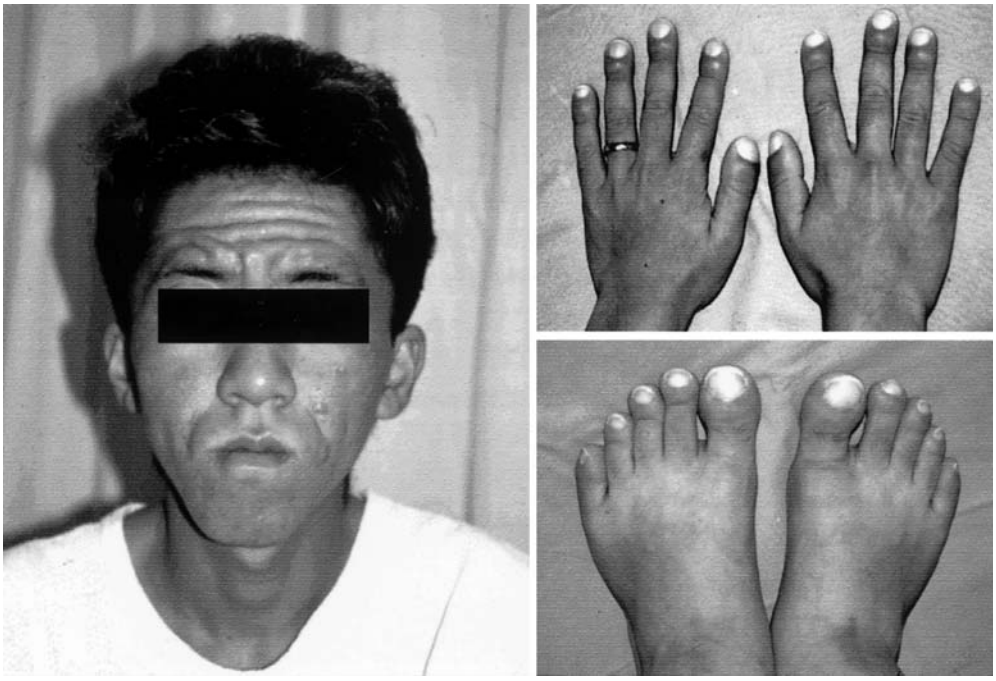

Fig. 1. Facial appearance and clubbing of the digits. Note the unusually deep furrows on the forehead and severe acne. Marked clubbing of the fingers and toes were also present

Fig. 2. Roentgenogram of the patient's knee (**a**), hands (**b**), lower leg (**c**), and forearm (**d**). No abnormal findings were noticed in the knee joints or fingers. Periosteal proliferation was observed in the middle of both the tibia and the fibula (**c**), and in both the radius and the ulna (**d**)

Discussion

PDP has been presumed to be inherited from either autosomal dominant or recessive genes.[3,4] Although the cause of this disease has not been clarified, several pathophysiologies, such as endothelial hyperplasia,[4] decreased or increased peripheral circulation,[5,6] or abnormal fibroblast proliferation, have been reported.[7] The secondary clubbing digits due to pulmonary osteoarthropathy and acromegaly were considered to be differentiated. In this case, no lung diseases were found, and growth hormone levels were normal. In almost 40% of patients, this disease is complicated by joint effusion, but the symptoms are not particularly severe[8] and only a few cases experience severe joint pain.[9] Histological examinations of synovia in those patients showed hypercellularity and vascular thickening or venous dilatation without inflammation.[9,10] In addition, no inflam-

matory signs were detected in the synovial fluid. In some cases, patient's presented with acute-onset arthralgia derived from pseudogout.[11–13] In this case, as well as the increase in CRP in the serum, we found elevated levels of IL-6 in serum and synovial fluids. These inflammatory cytokines are significantly increased in patients with inflammatory arthritis such as rheumatoid arthritis (RA) or crystal deposition disease, but are not so high in osteoarthritis (OA).[14] These findings suggest the existence of inflammation both locally and systematically in this case, and therefore there was some difficulty in distinguishing the disease from RA. It is known that an active adolescent phase of PDP is followed by a quiescent adult phase.[15] Since this disease never develops before puberty, the case in this study might be in the early stage of the disease. In fact, the patient's pain gradually improved over a few years, although no medicines were particularly effective.

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