

# PATHOLOGIC FRACTURE OF THREE EXTREMITIES AS FIRST SIGN OF ACUTE LYMPHOBLASTIC LEUKEMIA

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**Abstract-** Acute lymphoblastic leukemia (ALL) is the most common form of childhood cancer representing 80-85% of all leukemia. We describe a 3 years old girl with pain, swelling and tenderness in extremities since 8 months prior to her present admission. X-ray of extremities revealed callus formation, osteopenia and site of healed fractures. Bone marrow aspiration revealed ALL-L2 with normal peripheral smear. It is important for physician to recognize the skeletal manifestations of acute leukemia of childhood because a delay in diagnosis has an adverse effect on survival.

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**Key words:** Acute lymphoblastic leukemia, multiple fracture, radiologic finding, children

## INTRODUCTION

The childhood leukemia represents about 35% of all childhood malignancies. Acute lymphoblastic leukemia (ALL) is the most common form of childhood cancer, representing 80-85% of all leukemia (1). Environmental factors, viral infections and immunodeficiency are thought to play a role in leukemogenesis in addition to genetic factor.

The first symptoms are usually non specific. Although ALL is primarily a disease of bone marrow and peripheral blood, any other organ may be infiltrated by leukemic blasts. Such infiltration may easily be clinically apparent, such as lymphadenopathy or hepatosplenomegaly. However, leukemic infiltration of other organ may be occult and detectable only by histologic or cytologic examination or diagnostic image (2).

We report a patient who was referred to our ward with complain of intermittent joint and bone swelling of 8 months duration. The diagnosis of leukemia was made with bone marrow aspiration.

## CASE REPORT

A 3-year-old girl was referred to our ward with complain of intermittent fever, arthralgia and joint swelling since 8 months ago and admitted with impression of juvenile rheumatoid arthritis. The parents gave history of initial right elbow swelling and pain that had been improved with casting. Ankle and wrist swelling, pain and erythema developed later. According to parents, the patient had complain of sever tenderness and pruritus in extremities.

On examination, the patient was febrile (39°C) with regular pulse rate (110/minute). She had swelling and tenderness in right elbow and both metacarpophalangeal joints. Laboratory investigation showed: hemoglobin level of 9 g/l, WBC count of 11109/L, platelet count of 566109/L, erythrocyte sedimentation rate (ESR) of 120 mm, albumin level of 3 mg/dl, globulin level of 4.9 mg/dl; uric acid level of 4.8 and lactate dehydrogenase (LDH) level of 262.

Kidney function tests, arterial blood gas and serum calcium were all normal. X-ray of extremities revealed diffuse osteopenia and multiple lytic lesions in all bone. In both fibula and distal part of right ulna callus formation associated with periosteal reaction, site of multiple healed fracture. No evidence of juvenile rheumatoid arthritis was found. Bone

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marrow examination revealed more than 50% blasts consistent with ALL-L2.

We obtained informed consent from parents to publish details of their daughter's illness.

## **DISCUSSION**

Acute leukemia of childhood may present with various manifestations that mimic orthopedic conditions. The osseous radiographic abnormalities of this disease, although described in the literature, are not pathognomonic and certain changes may not be as frequent as previously thought (3). The variety and distribution of skeletal lesions in children with ALL is rarely seen in other diseases (4).

Skeletal radiographic changes that can occur in a child with acute leukemia include diffuse osteopenia, metaphyseal band, periosteal new bone formation, geographic osteolysis, osteosclerosis, sclerosis and permeative destruction (4). Compression fracture of vertebra (5) and femoral neck is occasionally found in patient with childhood ALL, but this symptom has also been reported as an adverse effect associated with chronic systemic use of glucocorticoids (6). About two-thirds of children with ALL have signs and symptoms in bones and joints of less than 4 weeks duration at the time of diagnosis (1).

ALL presenting with multiple fractures in distal of extremities and presence of only orthopedic problems for a long duration (8 months) before

diagnosis, without any hematologic evidence of leukemia, is very rare and to our knowledge has not been reported previously.

It is important for physician to recognize the skeletal manifestation of acute leukemia of childhood because a delay in diagnosis has an adverse effect on survival.

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