

Back pain: An unusual manifestation of acute lymphoblastic leukemia – A case report and review of literature

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ABSTRACT

Acute lymphoblastic leukemia (ALL) presented with bone pain and leukopenia is a well-recognized complex. Bone and joint pain are seen as presenting symptoms in 25% of patients with acute leukemia, but generalized osteopenia and vertebral complications are less common. Back pain due to vertebral changes as an early feature has been infrequently reported. We report a case of a 9-year-old female child who presented with back pain for 3 weeks. Blood counts and peripheral smear were normal. X-ray of the spine showed wedge-shaped deformity in L3–L5 vertebrae. Magnetic resonance imaging of the spine confirmed the lytic lesions of L3–L5 vertebrae. Infective etiological evaluation was normal. Bone marrow aspiration revealed pre-B-cell lymphoblastic leukemia. She was started on ALL protocol and pain subsided within a week, and remodeling of the bony lesions could be seen 2 months later. This case highlights that spinal involvement may be a presenting feature despite normal peripheral blood counts.

Keywords: Acute lymphoblastic leukemia, back pain, children

Introduction

Although back pain is fairly common in healthy children, when it is of disproportionate intensity and causes limitation of activities, it has to be thoroughly evaluated to identify the underlying pathology and not dismissed as a psychosocial or somatic cause. The younger the patient, the higher is the probability of establishing rare morphologic causes, such as benign or malignant tumors, congenital malformations, and infections. In children younger than 5 years old, the likelihood is more than 50%.^[1]

Although it is a well-described fact in literature that bone and joint pain are present in 40%–60% of cases in acute lymphoblastic

leukemia (ALL), the presence of the complaints with a normal peripheral blood counts, with no organ involvement or lymphadenopathy normally, diverts the attention from ruling out a bone marrow pathology.^[2] Intense and progressive pain restraining daily normal activities and causing difficulty in ambulation should be a red flag sign to lower the threshold for a quick in-depth analysis of the problem and include malignancy as the etiology after evaluating for the more common causes. We report this case with the intention of promoting greater awareness that ALL can cause significant back pain in children without other systemic symptoms.

Case Report

A 9-year-old female child presented to the orthopedic outpatient clinic with complaints of lower back pain for 3 weeks. The pain

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had been severe to restrict her daily activities and was progressive, excruciating, disturbing her sleep, and she was nonambulant for the last 10 days. She was being managed by local applicants and analgesics with no relief. There was no history of any trauma preceding the symptoms.

On examination, she was lying down in the supine position and not able to sit or walk. She was afebrile; no signs of pallor, petechiae, ecchymosis, lymphadenopathy, or organomegaly were found. Examination of the musculoskeletal system revealed tenderness over lumbosacral region and restriction of movements of the lower spine. No obvious deformities of the spine could be seen.

Power and reflexes of the both lower limbs were normal. There was no bowel or bladder dysfunction. Investigations revealed hemoglobin of 10.4 g/dl, total count of 3890 cells/cumm, with a differential count of polymorphs 42.4%, lymphocytes 56.6%, platelets 1.50 lakhs/cumm, lactate dehydrogenase (LDH) 183 mg/dl, uric acid 5.4 mg/dl. Peripheral smear showed no abnormal cells. X ray spine showed reduced height of L5 vertebrae [Figure 1]. Magnetic resonance imaging of the spine revealed anterior wedge configuration of dorsal vertebral bodies in L3–L5 [Figure 2]. She was evaluated for tuberculosis (TB) spine and found to be negative. With the pain worsening and not being relieved by any degree of analgesics and antibiotics, bone marrow aspiration was done which revealed pre-B-cell lymphoblastic leukemia. Karyotyping and cytogenetics were normal. She was started on children oncology ALL protocol. The back pain subsided in 1 week and she was ambulant after 2 weeks of chemotherapy. Radiological evaluation of the spine after 2 months of chemotherapy showed remodeling of the lesion. She is currently on maintenance phase of chemotherapy, 18 months from diagnosis and in remission.

Discussion

Acute leukemia, the most common malignancy in children usually presents with fever, pallor, petechiae, ecchymosis,

hepatosplenomegaly, lymphadenopathy, and bone pains. Bone and joint pain are seen as presenting symptoms in 25% of patients with acute leukemia.^[3] The less commonly reported manifestations are arthritis, bony lesions, generalized osteopenia, and vertebral complications.^[4] When these symptoms precede overt leukemia, the diagnostic delays complicate the management. When children or adolescents seek medical care for back pain, it is highly likely that there is an underlying pathology.

Vertebral body collapse and back pain are an unusual presentation for childhood leukemia that can cause significant back pain in children without other systemic symptoms. The presence of anemia, low or high white cell counts with lymphocytosis, and thrombocytopenia gives a clear picture of bone marrow involvement and the diagnosis is simpler; however, the absence of classic features with unusual features as initial manifestations has always led to delay in diagnosis as illustrated in literature.^[5] In children, acute leukemia at presentation can mimic several orthopedic pathologies so that a variable delay of the correct diagnosis is often reported.^[6] When the predominant symptoms are osteoarticular complaints, they lead the diagnosis toward nonmalignant conditions that are most common cause of such symptoms in children, such as injuries, nonspecific reactive arthritis, or inflammatory connective tissue diseases.^[2]

The common acquired pathological causes of vertebral collapse in children are Langerhans cell histiocytosis, chronic recurrent multifocal osteomyelitis, TB, pyogenic osteomyelitis, osteogenesis imperfecta, neoplastic lesions either primary, metastatic, or of hematological origin.^[7]

Vertebral collapse presenting as initial manifestation of acute leukemia has been suggested as a biologically unique subset of ALL. Characteristic findings of this rare primary manifestation of leukemia are lack of significant organomegaly or lymphadenopathy, normal or low white blood cell count



Figure 1: X ray spine of the child shows reduced height of L5 vertebrae

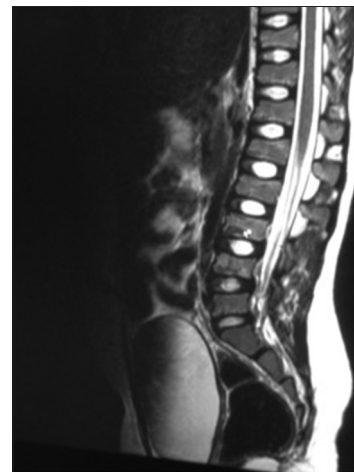


Figure 2: Magnetic resonance imaging of the spine of the child. The cursor shows features of anterior wedge configuration of dorsal vertebral bodies in L3–L5 vertebrae

with predominance of lymphocytes and rarely circulating lymphoblasts, normal platelet count, uric acid, and LDH values.^[8]

The musculoskeletal manifestations of leukemia include symmetric or migratory polyarthritides or arthralgias, bone pain and tenderness, and back pain mimicking a radiculopathy.^[9] Compressed vertebral bone fracture has been reported variously up to 31.25% in different articles, and antileukemic treatment usually results in rapid symptomatic relief as well as radiographic evidence of bony remodeling. In addition, bone involvement has no worse prognosis in comparison to cases without bone involvement.^[10]

Although vertebral fractures and lytic lesions of the spine at multiple levels had been the initial presenting features of ALL, despite the extensive vertebral body collapse, neurological compromise has been hardly reported in ALL unlike in other solid tumors involving the spine.^[11]

Conclusion

As bony lesions may precede clinical findings, knowledge of radiographic and orthopedic appearances of leukemia is important in order to initiate earlier treatment to avoid the progressive damage and improve their survival rates.

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Conflicts of interest

There are no conflicts of interest.

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