Joint Pain: Keeping ALL Differentials in Mind

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Introduction

- Acute lymphoblastic leukemia (ALL) results from the clonal proliferation of lymphoblasts.
- ALL accounts for more than 25% of all pediatric malignancies and primarily affects children ages 2 to 5.
- A definitive diagnosis of ALL is made by the presence of ≥20% blasts on bone marrow biopsy.
- The prodromal stage of ALL lasts weeks to months and presents with nonspecific symptoms such as fever and fatigue.
- Infiltration of the bone marrow leads to decreased production of other cell lines, resulting in anemia, bruising and bleeding, lymphadenopathy, and hepatosplenomegaly.
- Musculoskeletal manifestations are common, and may be an isolated presenting symptom as seen in 15-30% of ALL-associated bone pain cases.

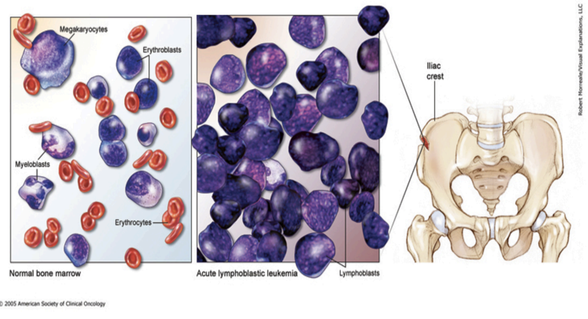

Figure 1: Normal bone marrow vs. marrow with lymphoblastic proliferation.
Source: American Society of Clinical Oncology

Case Presentation

- A 3-year-old female presented with left hip pain and limping on two separate occasions.
- The patient was afebrile and had an elevated CRP each time.
- A normal MRI and joint aspirate led to an initial diagnosis of transient synovitis, with an MRI on a subsequent presentation concerning for septic arthritis. Further infectious workup was unremarkable.
- Three months later, the patient presented for similar symptoms, but on the right side.
- An Xray showed periosteal thickening worrisome for an infiltrative process.
- Labs revealed a CBC with elevated WBC and 57% lymphoblasts, leading to a diagnosis of ALL.

CBC Results Per Hospital Admission

	First (Jan)	Second (Feb)	Third (May)	Reference Range
WBC % Blasts	8.3 0	6.8 0	12.9 57	4.9-13.2
Hb/Hct	14.6/43.2	10.9/30.8	10.9/32.7	10.2-12.7/ 31.2-37.8
Plt	241	319	145	189-394

Figure 2: T2 MRI of left hip joint during first admission (left) vs. second admission (right).

Discussion

- Acute lymphoblastic leukemia often proceeds with an indolent course over several weeks to months, eventually leading to the classic symptoms of fever, fatigue, and bruising.
- Musculoskeletal symptoms may also occur, including bone pain, an inability to bear weight, and the presence of joint effusions on imaging.
- In rare cases, musculoskeletal complaints are the only presenting finding of ALL.
- Repeated visits over months for the evaluation of limb pain are common in these situations, with no definitive diagnosis being made until lymphoblasts are seen on CBC or bone marrow aspirate.

Conclusion

- ALL may present with isolated musculoskeletal symptoms.
- Due to the potential for delay in diagnosis and treatment, physicians should keep ALL high on their differential in a pediatric patient presenting with aseptic joint effusion.
- Additionally, providers should refrain from using steroids as this can mask leukemia and increase resistance.

References

1 Louvigné, M., Rakotonjanahary, J., Goumy, L. et al. Persistent osteoarticular pain in children: early clinical and laboratory findings suggestive of acute lymphoblastic leukemia (a multicenter case-control study of 147 patients). Pediatr Rheumatol 18, 1 (2020).

2 Pui CH, Robison LL, Look AT. Acute lymphoblastic leukaemia. Lancet. 2008 Mar 22. 371(9617):1030-43.

3 Ribera JM, Oriol A. Acute lymphoblastic leukemia in adolescents and young adults. Hematol Oncol Clin North Am. 2009 Oct. 23(5):1033-42,

4 Zombori, L., Kovacs, G., Csoka, M. et al. Rheumatic symptoms in childhood leukaemia and lymphoma-a ten-year retrospective study. Pediatr Rheumatol 11, 20 (2013).