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Diffuse Osteosclerosis in AML: A Case Report

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Background: Diffuse osteosclerosis is a rare complication of haematological malignancies. While primary myelofibrosis and acute megakaryocytic leukaemia are known associations, acute myeloid leukaemia (AML) is rarely reported. We present a case of a 45-year-old male with disabling backache due to diffuse osteosclerosis and an underlying diagnosis of AML.

Case Presentation: A 45-year-old male presented with disabling lower back pain and pain in the long bones of the lower limbs for one week. He had significant constitutional symptoms and recurrent upper respiratory tract infections for three months. Physical examination revealed pallor and non-tender, sub-centimetre submandibular and inguinal lymphadenopathy. Hematological investigations indicated pancytopenia, progressing to leucocytosis with suppressed other cell lines and elevated inflammatory markers. Non-contrast CT of the spine and contrast-enhanced CT (CECT) of the chest, abdomen, and pelvis revealed diffuse bone sclerosis. Bone marrow biopsy and immunophenotyping confirmed AML with 50% blast infiltration. He showed significant improvement after induction chemotherapy. However, the second cycle of consolidation therapy was complicated by severe neutropenic sepsis, and he succumbed to the illness one year after diagnosis.

Discussion: Diffuse osteosclerosis in AML is characterized by increased bone density due to abnormal accumulation of immature myeloid cells in the bone marrow, leading to decreased marrow space. This can manifest as diffuse sclerosis involving the spine, pelvis, and other skeletal sites. The mechanism may involve leukemic blasts infiltrating the bone marrow, disrupting normal bone remodelling, or cytokines from leukemic cells stimulating osteoblastic activity and suppressing osteoclastic response. Bone marrow biopsy is the gold standard for diagnosing AML, but it can be challenging due to decreased marrow space. Management involves treating underlying leukaemia with chemotherapy or bone marrow transplantation.

Conclusion: Diffuse osteosclerosis is a rare presentation in AML, posing a diagnostic challenge. Our case underscores the importance of considering underlying haematological disease in pancytopenia and highlights the pathophysiological complexity of systemic osteosclerosis.