

Hyperparathyroidism-induced brown tumor presenting with metastatic bone disease-like skeletal lesions: A case report and literature review

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ABSTRACT

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A common clinical sign of paraneoplastic syndromes, hypercalcemia can be difficult to diagnose, especially when the primary tumour is unknown. Brown tumour is a benign osteolytic lesion resulting from hyperparathyroidism. Despite being uncommon—its estimated incidence in patients with primary hyperparathyroidism ranges from 1.5% to 4.5%—it can manifest as severe hypercalcemia and skeletal destruction that closely resembles bone metastases. We describe a 37-year-old woman who had a pathological femur fracture and was admitted with severe pain. Significant hypercalcemia and elevated serum creatinine were found during laboratory tests. Considering the patient's young age, metastatic bone disease was initially suspected as a more probable etiology than multiple myeloma. But we were unable to locate the main tumour. During the acute phase, the management of hypercalcemia and pain control were given top priority. A brown tumour was discovered by histopathological analysis after orthopaedic intervention and bone biopsy at the fracture site. The diagnosis of primary hyperparathyroidism as the underlying aetiology was confirmed by a subsequent endocrinological workup, which revealed noticeably elevated parathyroid hormone (PTH) levels. This case emphasises how crucial it is to keep a wide differential diagnosis in mind when dealing with osteolytic lesions and hypercalcemia, particularly when there is no primary cancer to confirm the diagnosis. Even though brown tumours are uncommon, they should be taken into account in these situations to prevent misdiagnosis and ensure appropriate management. From a clinical and radiographic perspective, brown tumours can closely resemble metastatic bone disease. To achieve diagnostic clarity, a multidisciplinary approach that includes endocrine evaluation and histopathology is essential. Delays in receiving effective treatment can be avoided by identifying primary hyperparathyroidism early.

ABSTRAK

Hiperkalsemia merupakan salah satu manifestasi klinis yang sering dijumpai pada sindrom paraneoplastik, namun diagnosis nya kerap menantang, terutama ketika tumor primer belum teridentifikasi. *Brown tumor* adalah lesi osteolitik jinak yang terjadi akibat hiperparatiroidisme. Meskipun jarang—dengan angka kejadian pada pasien hiperparatiroidisme primer diperkirakan sekitar 1,5% hingga 4,5%—kondisi ini dapat bermanifestasi sebagai hiperkalsemia berat dan destruksi tulang yang menyerupai metastasis tulang. Kami melaporkan kasus seorang perempuan berusia 37 tahun dengan fraktur patologis femur yang datang dengan keluhan nyeri hebat. Pemeriksaan laboratorium menunjukkan hiperkalsemia signifikan dan peningkatan kadar kreatinin serum. Mengingat usia pasien yang relatif muda, pada awalnya metastasis tulang lebih dipertimbangkan sebagai etiologi yang lebih mungkin dibandingkan multiple myeloma, meskipun tumor primer tidak berhasil ditemukan. Pada fase akut, penatalaksanaan difokuskan pada kontrol nyeri dan penanganan hiperkalsemia. Lesi *brown tumor* kemudian teridentifikasi melalui analisis histopatologi setelah intervensi ortopedi dan biopsi tulang pada lokasi fraktur. Diagnosis hiperparatiroidisme primer sebagai etiologi dasar dikonfirmasi melalui pemeriksaan endokrin lanjutan yang menunjukkan kadar hormon paratiroid (PTH) sangat meningkat. Kasus ini menekankan pentingnya mempertahankan spektrum diagnosis banding

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yang luas pada pasien dengan lesi osteolitik disertai hiperkalsemia, terutama bila tidak terdapat bukti kanker primer. Meskipun jarang, *brown tumor* perlu dipertimbangkan untuk mencegah salah diagnosis dan memastikan tatalaksana yang tepat. Dari sudut pandang klinis maupun radiologis, *brown tumor* dapat sangat menyerupai metastasis tulang. Untuk mencapai kepastian diagnosis, pendekatan multidisiplin yang melibatkan evaluasi endokrin dan pemeriksaan histopatologi sangat penting. Identifikasi dini hiperparatiroidisme primer dapat mencegah keterlambatan terapi yang efektif.