Brown Tumor: A rare complication of secondary hyperparathyroidism

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Introduction

Brown tumors, also known as, osteitis fibrosa cystica, are rare manifestations seen in patients with uncontrolled primary, secondary or tertiary hyperparathyroidism. As a consequence of excessive parathyroid hormone secretion, bone alterations occur mainly as expansive lytic lesions. Brown tumors are mostly seen in patients with primary hyperparathyroidism, with prevalence of 4.5%, but may be present in 1.5-1.7 % of cases of secondary hyperparathyroidism. We present a case of a female with ESRD on hemodialysis, who was diagnosed with a brown tumor, involving the third rib, secondary to refractory hyperparathyroidism.

Clinical Case

A 43 year-old- female with ESRD on hemodialysis for the past 14 years and non-compliance history, presented to the ED complaining of malfunctioning dialysis catheter. Admission labs showed hematocrit 25.1% (37-47%), BUN 70 (7-17 mg/dl), creatinine 15 (0.5- 1.0 mg/dl), bicarbonate 20 (22-30 mEq/L), calcium 7.1 (8.4-10.2 mEq/L), and phosphorus 6.8 (2.5-4.5 mg/dl). Incidentally, her chest X-ray showed a left sided pleural based mass (Figure 1). CT of chest with contrast showed an expansive lobulated mass (2.5 x 3.6 x 2.1 cm), arising from the left lateral third rib with cortical breakthrough (Figure 2). CT-guided biopsy showed focal intramedullary fibrosis, scattered collection of hemosiderin and remodeling boney trabeculae with few osteoclastic multinucleated giant cells consistent with the osteitis fibrosa cystica (Figure 3). Parathyroid level was 892(14-64 pg/ml) and alkaline phosphatase was 187(37-126 U/L). These findings were compatible with hyperparathyroidism and brown tumor. The patient was hemodialyzed and parathyroid level trended down. She was discharged with outpatient follow-up and was encouraged to be compliant with hemodialysis.

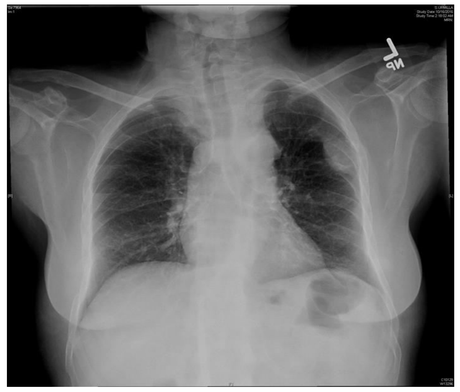

Figure 1. Chest X-ray showing left sided pleural based mass.

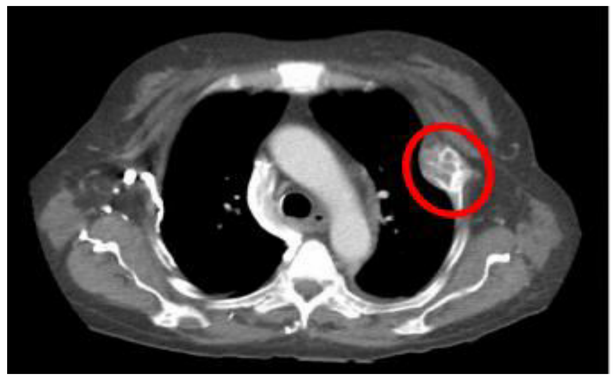

Figure 2. CT of chest with contrast showing lobulated mass arising from the left lateral 3rd rib with cortical breakthrough.

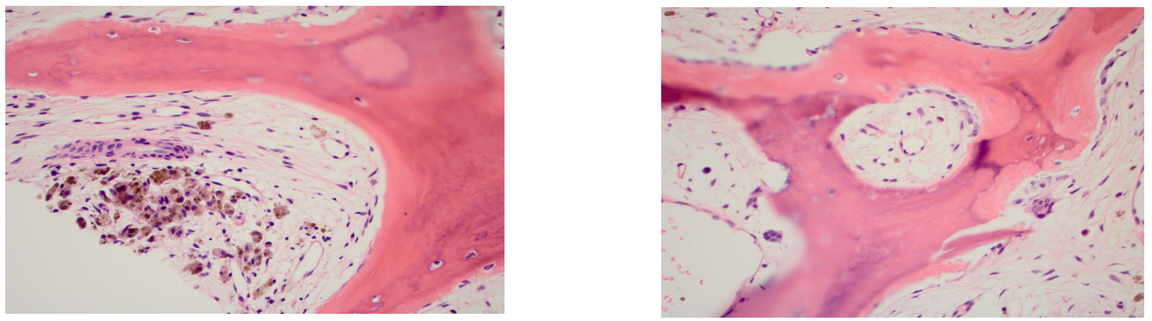

Figure 3. H&E stain of pleural mass biopsy **(a)** showing numerous multinucleated giant cells in a hypercellular fibrous background with hemosiderin pigmentation, **(b)** osteoclasts and C shaped bone cysts representing osteitis fibrosa cystica.

Discussion

Brown tumors are rarely seen in patients with untreated hyperparathyroidism, total incidence being 0.1%. When present, these lesions are seen in the long bones, ribs, clavicle and pelvic girdle, although they can occur at any other site. Hypocalcemia and hyperphosphatemia leads to elevated parathyroid levels, which increases osteoclastic activity and bone remodeling. Such lesions simulate cancer and pose a challenge to the clinician making the diagnosis. Imaging modalities include CT scan or MRI. If bony lesions are found in patients with hemodialysis, osteitis fibrosa cytica should be excluded. Treatment should target normalizing parathyroid levels with medication, dialysis, parathyroidectomy or kidney transplantation. Surgical resection of the lesion itself is only recommended if it does not regress after 1-2 years of treatment or it compromises body functions. If medical management with calcitriol and phosphate binders fail, parathyroidectomy is the next step.

References:
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