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Case Study

Parathyroid Carcinoma: Case Study

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ABSTRACT

Introduction: Parathyroid carcinoma is a rare malignant tumor, which poses great diagnostic and therapeutic difficulties.

Case presentation: This is a 58-year-old patient who presents with iterative pathological fractures with severe hyperparathyroidism. The radiological assessment showed a left thyroid tumor mass associated with multiple bone metastases. After treatment of severe hypercalcemia, total thyroidectomy with para-thyroidectomy and lymph node dissection was performed, and the pathological study supported an immunohistochemical aspect of parathyroid carcinoma.

Conclusion: The purpose of this case is to raise awareness of Parathyroid carcinoma as a rare malignant tumor, difficult to diagnose, must be suspected in cases of severe clinical and biological primary hyperparathyroid syndrome.

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INTRODUCTION

Parathyroid carcinoma is one of the rarest malignancies with an estimated prevalence of 0.005% of all cancers. It is also a very rare endocrine cancer (<1% of all cases of primary hyperparathyroidism) with a reported incidence ranging from 0.5 to 5% [1]. We report a case of parathyroid carcinoma revealed by malignant hypercalcemia with multiple pathological fractures.

CASE:

58 years old man, who has hypothyroidism. He was admitted for an hypercalcemia management. The patient have a past history of iterative pathological fractures: a fracture of the left femoral neck, 7 years ago, two fractures following low-energy trauma at the collarbone and the right forearm and recently medio-diaphyseal fracture of the left femur.

At admission, the patient presented with normal vitals, was nevertheless dehydrated without vascular or neurological abnormalities. However, he had a lower anterior cervical mass. The initial biological assessment showed hypercalcemia leveling 155 mg/l, wich was asymptomatic including no sign of electrical abnormalities on the electrocardiogram. Parathyroid hormone levels were at 925.2 µg/ml, sedimentation rate at 75 mm per hour, C-protein reactive at 12.83 mg/l, TSHus hormone at 13.74 mIU/l, alkaline phosphatase at 262 IU/l. The patient went under parenteral rehydratation, diuretic, corticosteroid and Zoledronic acid perfusion leading to a lowering in calcium rates until total normalization within 48 hours after the perfusion.

Standard X-rays showed a diaphyseal pathologic fracture of the left femur with multiple lytic lesions and diffuse bone demineralization at the pelvis, right forearm, right femur, clavicle and humerus (Figure 1). Cervical ultrasound showed a deep left cervical mass pushing back the left thyroid lobe and the trachea. Cervico-thoraco-abdominopelvic CT showed both a left thyroid and parathyroid tumor mass with endothoracic extension and local infiltration also associated with multiple metastasis on the left ribs and both the pelvic bones (Figure 2).

Total thyroidectomy with parathyroidectomy and lymph node dissection was performed. Histologic study concludes to a parathyroid carcinoma (Figure 3). The patient was then referred to the oncology department for further case management.

Figure 1 :Diaphyseal pathological fracture of the left femur with multiple lytic lesions and diffuse bone demineralization in the pelvis, left femur, right collarbone and humerus

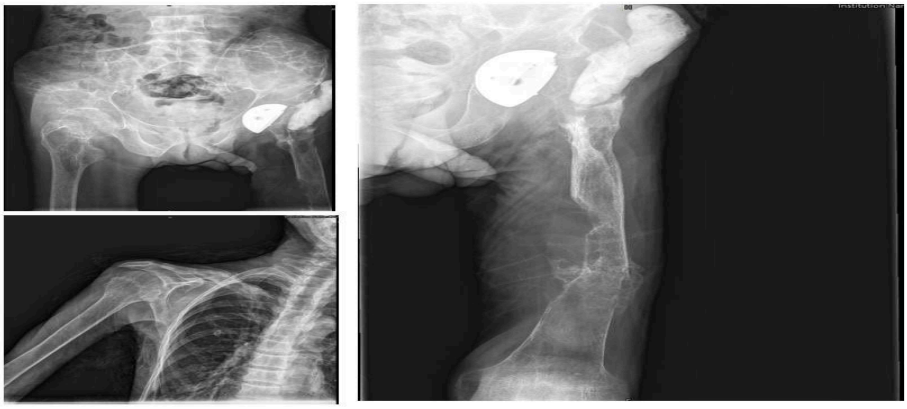


Figure 2 :Cervico-thoraco-abdominopelvic CT. Multiple bone metastasis

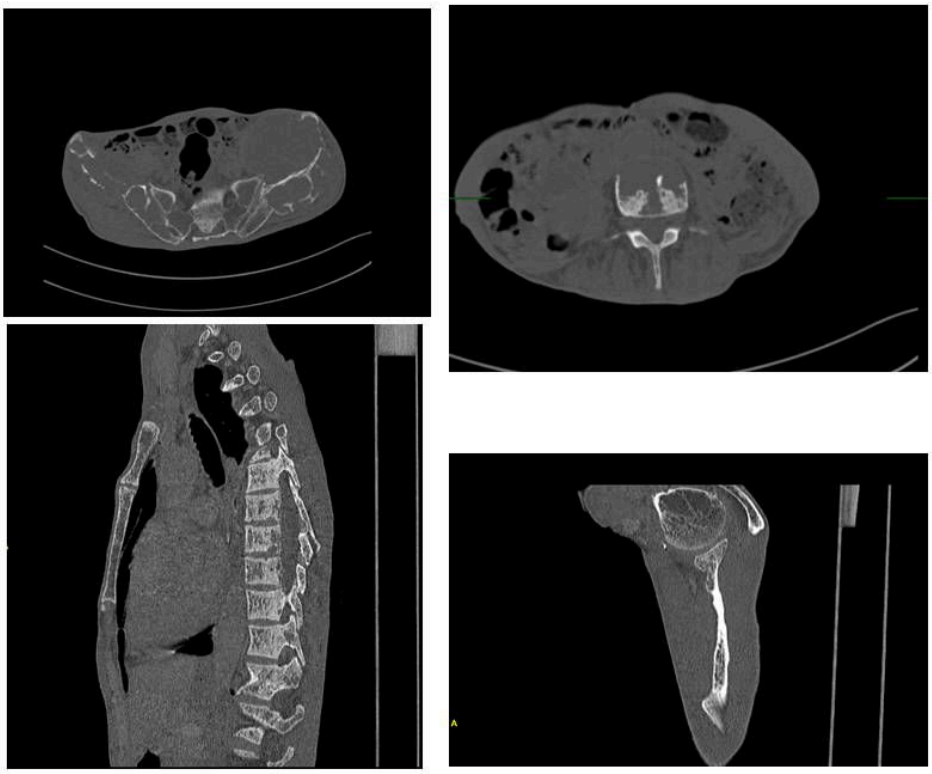
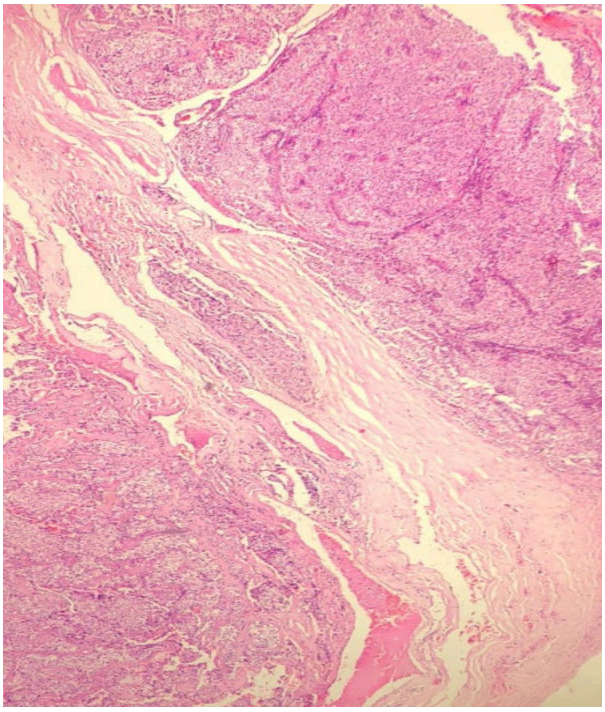


Figure 3 : Tumor proliferation made of cohesive clusters of endocrine appearance. The adjacent thyroid parenchyma is of vascular lobular architecture



DISCUSSION:

Parathyroid carcinoma is one of the rarest malignant tumors that can occur sporadically or as part of a genetic syndrome, accounting for about 1% of patients with hyperparathyroidism . It must be suspected in cases of severe clinical and

biological primary hyperparathyroid syndrome, most often associated with a palpable cervical mass. Although some cases with non-secreting parathyroid carcinoma have been reported [1-2]. Parathyroid carcinoma typically presents equally in men and women between the ages of 45 and 59 years [2]. The etiology remains unknown, however genetic predisposition factors, or risk factors such as prior neck radiation and end-stage renal disease have been described [1-3-4].

The overwhelming majority of parathyroid cancers are functioning tumours. Therefore, patients most often present with symptoms and signs of hypercalcaemia, such as fatigue, malaise, weakness, weight loss and anorexia; psychiatric manifestations (i.e. depression) and digestive symptoms (e.g. nausea, vomiting, abdominal pain, peptic ulcer, pancreatitis and constipation) [1-4].

The clinical criteria for suspicion of malignant parathyroid neoplasm are: age below 55 years; marked hypercalcaemia and hyperparathormonaemia (more than 10 times over the limit); severe bone symptoms (fibrocystic osteitis in 40%–70% of cases) and kidney symptoms (nephrocalcinosis, nephrolithiasis in 30% 60% of cases); recurrent laryngeal paralysis due to tumor invasion; Palpable cervical swelling, that is rare in benign disease. Up to 50% of patients present with a palpable neck mass related to either advanced local or regional metastatic disease [1-5].

Non-invasive studies—ultrasound, 99mTc-labeled sestamibi scintigraphy, computerized tomography, and magnetic resonance imaging- may be of aid in patients with a suspicion of PC and for localizing recurrences. 8F-fluorode-oxyglucose positron emission tomography (FDG PET) despite a low sensitivity in detecting small lesions, is a very sensitive imaging technique to define the extension of the disease at initial evaluation and identify a recurrence [6]. Although the instrumental diagnosis is nonspecific, signs of malignancy may be revealed, such as irregular margins, pathological lymphadenopathy and any invasion of adjacent structures. However, the definitive diagnosis is provided by the pathologist [7].

According to the World Health Organization, there are no specific criteria. Some further indicators must be sought to confirm the diagnosis of PC:

- Presence of vascular invasion (in the capsule or adjacent tissues);
- Capsular invasion with extension to adjacent tissues and / or
- Presence of metastasis [3].

The main differential diagnosis is parathyroid adenoma, but parathyroid hyperplasia, vesicular thyroid carcinoma or, more rarely, metastasis of clear-cell carcinoma of the kidney must be eliminated [3]

Bisphosphonates are effective to reduce serum calcium but they lose their effectiveness over time. [8]. Denosumab, was recently reported to be effective for several months in the management of severe hypercalcemia in patients with metastatic disease [1]

Recently, new calcimimetic drugs have been industrialized for PTH-related hypercalcemia management. Cinacalcet binds to calcium receptors on the surface of parathyroid cells and increases the sensitivity of the extracellular calcium receptor and subsequently decreases serum PTH and calcium levels [8].

The treatment of choice is complete surgical resection, the only technique that is potentially curative. The goal is to remove the entire tumour, prevent local recurrence and eliminate the risk of distant metastasis originating from regionally persistent disease. Complete en bloc resection with

ipsilateral hemithyroidectomy and centrocervical lymphadenectomy should represent the minimum oncological approach in all patients with suspected PC. [1-9].

Chemotherapy and external radiotherapy are generally ineffective. Parathyroid carcinoma usually recurs two to five years after the initial surgery. Local recurrence rates vary between 33% and 82% at five years and are most likely due to incomplete resection [1-8].

CONCLUSION:

The diagnosis of parathyroid carcinoma continues to be a challenge. In the absence of a gold standard test, a multidisciplinary approach, considering all clinical, biochemical and structural aspects of the disease, offers the best chance for accurate diagnosis.

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