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Research Article

BROWN TUMOR PRESENTING AS A TIBIALLESION OF SUSPECTED MALIGNANT ORIGIN: A CASE REPORT

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A R T I C L E I N F O

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A B S T R A C T

Hyperparathyroidism is rarely presenting as brown tumor in recent years and in those rare cases cranial involvement was frequently reported. We did not find any publication about this condition in the Kingdom of Saudi Arabia after reviewing PubMed. We present a case of a female patient presenting with prolonged history of right proximal anterior tibial painful mass that initially was suspected to be of malignant origin. Different imaging modalities were used which initially bred conflict among Radiologists. Relevant blood tests were last to be requested and the high levels of parathyroid hormone (PTH), hypercalcemia combined with nuclear imaging findings confirmed the presence of right parathyroid adenoma. The rarity and unusual presentation made the diagnosis challenging.

INTRODUCTION

Brown tumor, or osteitisfibrosacystica, is a metabolic bone lesion that occurs in advance cases of hyperparathyroidism[1]. In recent years routine blood tests have been increasingly diagnosing cases of hyperparathyroidism incidentally when patients are asymptomatic, or doing them for different medical reasons[2]. It is very rare nowadays to present as brown tumor; in such late presentations it can be wrongly considered as a malignant tumor, or metastatic bone lesion[3].

Case presentation

Forty-one year-old Saudi female not known to have chronic medical illnesses, presented to emergency room complaining of right knee painful swelling for long duration. She also gives history of generalized bone pain. On examination she was conscious, oriented, and vitally stable. General examination was unremarkable. Local examination was significant for proximal anterior tibial swelling which was solid and tender. Emergency physician requested a plain x-ray film and radiological impression was either metabolic bone disease or metastatic bone lesion (figure one).

Figure 1 Plain X-ray of the right tibia, anteroposterior and mediolateral views showing multiple cystic lesions at the distal femur, lower pole of the patella, and anterior tibia (this lesion having exophytic component with a bulging of the anterior subcutaneous fat)

One month later, patient underwent magnetic resonance imaging (MRI) of the right leg as the lesion was suspiciously malignant to the Orthopedic surgeon. The findings, like the plain x-ray, suggested either metabolic disease like brown tumor or bony metastasis. During this one month period, no laboratory investigations were requested and patient condition remained the same.

Afterwards, the patient underwent enhanced Computed Tomography (CT) chest, and bone survey as the primary physician wanted to rule out metastatic bone disease. CT chest

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showed multifocal destructive osteolytic lesions, and right thyroid lobe heterogeneous nodule. The radiological impression was thyroid cancer. Bone survey showed picture of primary hyperparathyroidism (figures 2 and 3).

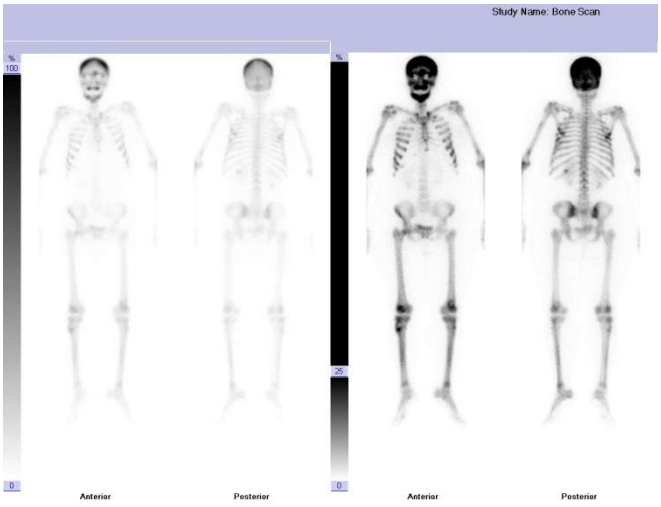

Figure 2 Tc99m-MDP Triple phase Bone Scan (delay images), enhanced radiotracer uptake seen opposite the skull, mandible, spine, and long bones (right proximal tibia) with faint visualization of the kidneys

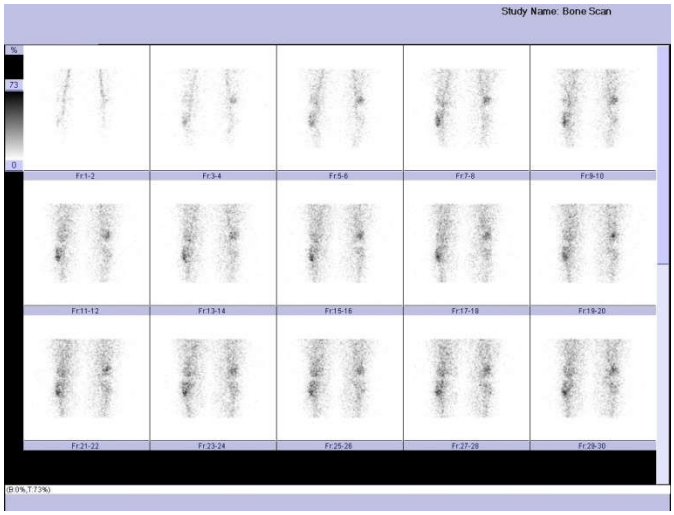

Figure 3 Tc99m-MDP triple phase Bone Scan (blood pool): enhanced radiotracer uptake seen at proximal right tibia.

Now the Radiologists in our institution were divided. The nuclear imaging impression is metabolic bone diseaseso he scheduled the patient for nuclear parathyroid scanand advised the primary physician to take thyroid function test (TFT), PTH level, and bone panel. On the other hand, the general radiologist is going for CT abdomen, pelvis, and neck ultrasound (US) to search for neoplastic origin which could be the cause of these osteolytic lesions. The patient meanwhile is still following up as outpatient, devastated by the initial impression given to her by initial physician that she might be harboring disseminated malignancy.

In the next few days, patient underwent sestamibi PTH whole body scan. The impression was that in view of clinical & radiological datascintigraphic evidence is indicative of metabolic bone disease due to right parathyroid adenoma (figure4).

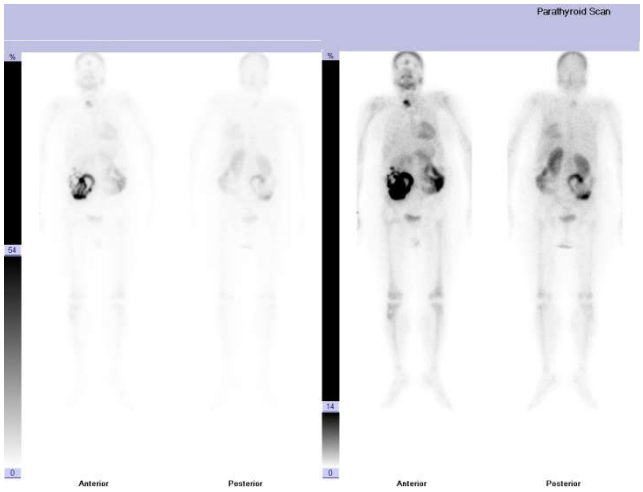

Figure 4 Tc99m-SESTAMIBI Parathyroid scan (2 hours post injection Whole Body): focal abnormally enhanced radiotracer uptake was detected at the level of the right thyroid lobe. Also notice the similar findings as the whole body bone scan, with a spot of increased uptake at the level of the glabella.

She also did CT abdomen and pelvis showing scattered expansile lytic bone lesions in almost all pelvic bones and lumbar spine. There is bilateral sacroiliac joint erosion and/or bone resorption. Gallstones and renal stones were present. The impression was metabolic bone disease due to primary hyperparathyroidism.

Shethen did bloodworkup which was significant for hypercalcemia 3.26 mmol/L, elevated alkaline phosphatase (ALP) 700 U/L, hyperparathyroidism (PTH 228 pmol/L), Low Vitamin D3 10.12 ng/mL, low thyroid stimulating hormone (TSH) 0.387 uIU/mL, free T4, and T3 were within normal range.

Lastly, she underwent thyroid US. The impression was parathyroid nodule indenting right thyroid lobe with bilateral insignificant lymph node enlargement (figure 5).

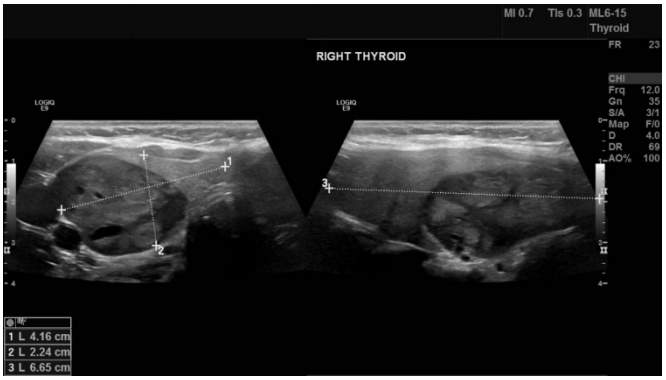

Figure 5 US Thyroid: right thyroid lobe is markedly enlarged with normal texture and flow. There is right well-defined large mass with heterogeneous texture.

With the latest nuclear scans and lab findings, parathyroid adenoma was confirmed to be the cause of elevated PTH, therefore brown tumor was recognized without a doubt to be the presenting feature in this patient. As Endocrine surgeon is not available in our institution, the patient was referred to higher center for further evaluation and management after medical care for hypercalcemia.

Date	Presentation	
21Feb 2018	Medically free, presented with chief complaint of right knee painful swelling for long duration and history of generalized bone pain Local examination was significant for proximal anterior tibial swelling, solid and tender Plain x-ray impression was either metabolic bone disease or metastatic lesion Patient booked for MRI, no relevant blood tests were requested	
29Mar 2018	Out-patient Investigation	Result
	MRI right leg	Radiologist impression was either metabolic bone disease or metastatic lesion
9Apr 2018	CT chest	General Radiologist considered the findings to be suggestive of right thyroid cancer, advised primary physician to do CT abdomen, pelvis, and neck US
	Bone survey	Picture of primary hyperparathyroidism, nuclear Radiologist advised parathyroid nuclear scan, PTH level, TFT and bone panel
12 Apr 2018	Tc99m Sestamibi PTH and whole body scan	Metabolic bone disease due to right parathyroid adenoma
	CT Abdomen and pelvis	Metabolic bone disease
	Relevant blood work up	Hypercalcemia (3.26 mmol/L), elevated ALP (700 U/L), high PTH (228 pmol/L), Low Vitamin D3 (10.12 ng/mL), low TSH (0.387 uIU/m)
	Thyroid US	Parathyroid nodule indenting right thyroid lobe
15 Apr 2018	Brown tumor due to primary hyperparathyroidism confirmed to be the cause of patient complaint after extensive radiological investigations and blood work up Hypercalcemia control Patient transferred to higher center as Endocrine surgeon is not available in our institution	

DISCUSSION AND CONCLUSION

The presented case shows the biased judgment of the health care system. Even though initial plain x-ray suggested the possibility of metabolic bone disease, relevant blood workup to rule out metabolic bone disease were only requested after 2 months from the initial presentation. Maybe this is due its rarity, lack of systemic symptoms, insidious onset of her complaint, all of these have participated in skewing physician opinion toward malignancy. Not only that, the location of the lesion is also an important factor.In regard to lower limb affliction by brown tumors, it is documented in the fibula[4], patella[5], and femur[6], butinvolving the proximal tibia is not frequently reported.

Even though advanced imaging modalities were used, their use was not sequentially judicious. MRI was performed on the affected limb after one month from presentation and the rest of the investigations afterwards. The patient wouldn't have to do MRI in the first place, if after the initial plain x-ray relevant blood work up, and US of the thyroid were performed. In which case, the thyroid lesion will guide to do nuclear scanning, even may obviate the need for CT.

We cannot confirm if the involved parathyroid gland is harboring malignancy since the patient was transferred to a higher center. It is reported in the literature that some cases of brown tumor were found to co-exist with malignancy[7, 8]. Considering the aforementioned statement, and rarity of brown tumor nowadays, it was appropriate that the primary physician ruled in malignancy in their differential diagnosis. Our point is that placing metabolic bone disease (in this case brown tumor) among the differential diagnosis should have been considered, which can be simply ruled out by blood tests.

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