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Patient with chronic kidney disease and secondary hyperparathyroidism. Case report

Paciente con enfermedad renal crónica e hipertiroidismo secundario. Reporte de caso

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Abstract

Chronic kidney disease is the progressive and irreversible decrease of the glomerular filtration. Because of this, the onset of hormonal and metabolic changes is determined. Among the changes, there are vitamin D, calcium, phosphorus, parathyroid hormone and the acid-base balance. This generates multiple stimuli in the parathyroid gland and develops secondary hyperparathyroidism. Brown tumor represents one of the most common complications of this issue. Hereby, a bibliographic review is made, which encompasses the connections between chronic kidney disease and hyperparathyroidism, since the clinical case of a female patient, with 35 years old, came up. The female presents a record of CKD and a rise in the bilateral intraoral volume in the anterior lower-left area and upper right premolars, without any symptoms, in a slightly violaceous color with telangiectasias on the surface, soft at palpation, with a sessile base, 3 months of evolution and a slow growth. When the patient was directly interviewed, she reported weight loss, general malaise, fatigue, a change in skin color and excessive transpiration. A differential diagnosis is made and it establishes a definite histological diagnosis for the brown tumor of the secondary hyperparothyroidism.

Key words: *hyperparathyroidism, brown tumor, chronic kidney disease.*

Resumen

La enfermedad renal crónica es la disminución progresiva e irreversible de la filtración glomerular. Debido a esto, se determina la aparición de cambios hormonales y metabólicos. Entre los cambios, se encuentran afectadas la vitamina D, el calcio, el fósforo, la hormona paratiroidea y el equilibrio ácido-base. Esto genera múltiples estímulos en la glándula paratiroides y desarrolla hiperparatiroidismo secundario. El tumor pardo representa una de las complicaciones más comunes de este problema. De este modo, se realiza una revisión bibliográfica, que abarca las conexiones entre la enfermedad renal crónica y el hiperparatiroidismo; ya que se presentó el caso clínico de una paciente de sexo femenino, con 35 años de edad. La mujer presenta un registro de ERC y un aumento en el volumen intraoral bilateral en el área anterior inferior izquierda y premolares superiores derechos, sin ningún síntoma, en un color ligeramente violáceo con telangiectasias en la superficie, suave a la palpación, con una base sésil, tres meses de evolución y un crecimiento lento. Cuando la paciente fue entrevistada directamente, reportó pérdida de peso, malestar general, fatiga, un cambio en el color de la piel y una transpiración excesiva. Se realiza un diagnóstico diferencial que establece un diagnóstico histológico definitivo del tumor pardo del hiperparotiroidismo secundario.

Palabras clave: *hiperparatiroidismo, tumor pardo, enfermedad renal crónica.*

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INTRODUCTION

Hyperparothyroidism is characterized by the overproduction of parathyroid hormones, which results in the rise of calcium release in the bones. This also raises the concentration of calcium in plasma and alters its absorption in the kidneys and intestine.[1]

Brown tumor of the hyperparathyroidism represents one of the most common complications, with a frequency of 1.5 to 1.75% in the secondary hyperparathyroidism and of 3 to 4% in the primary hyperparathyroidism. There are several bone structures that can be affected. Among the most frequent ones, there are the long bones, ribs, clavicle, iliac crest, vertebrae, pelvis and the carpus, maxilla and tarsus bones. Nevertheless, it is relatively infrequent in the upper maxillary with a frequency of 4.5 to 11.8%.[2-4]

Primary hyperparothyroidism is characterized by the hypersecretion of the HPT, in which 85% of the cases is due to the development of adenomas. Most of the cases of primary hyperparathyroidism are identified by hypercalcaemia and hypophosphatasia. Clinically, brown tumors are presented as an augmentation of the volume, clear palpableness and visibility. Radiographically, brown tumors are shown as mononuclear, multiocular and osteolytic lesions with root resorption and occasionally the loss of the hard layer. According to various authors, they inform that in 40% of the cases there is a radiographic loss of the hard layer, which could be confused with alteration of conditions related to the periodontal disease and oftentimes it can delay the finding of injuries or it might impede it to associate it with hyperparathyroidism.[4-6]

CLINICAL CASE

Female patient of 35 years old shows up at the division of maxillofacial surgery of the HGZ 46 (*Hospital General de Zona 46*) at the IMSS (*Instituto Mexicano del Seguro Social*), after being referred by the division of nephrology with a diagnosis of CKD.

After the clinical exploration the patient discloses a rising in the bilateral intraoral volume in the anterior lower-left area and upper right premolars, without any symptoms, in a slightly violaceous color with telangiectasias on the surface, soft at palpation, with a sessile base ***(figures 1 and 2)***, 3 months of evolution, a slow growth, dental movement of the OD 31, 32, 33, 34, loss of the O.D. At the orthopantomography it is possible to observe multiple radiolucent and unilocular lesions, well delimited in the premolar region in the upper right maxillary in the anterior lower left and the inferior left region ***(figure 3).***

When the patient was directly interviewed, she reported weight loss, general malaise, fatigue, a change in skin color and excessive transpiration. Histologically, a compatible lesion can be observed, with a giant cells' granuloma. By doing the clinical-pathological corroboration, it is possible to diagnose a brown tumor of the hyperparathyroidism. Multinucleate giant cells in a granulomatous stroma can be observed, with multiple vascular capillary spaces, intralesional hemorrhage, and presence of hemosiderin ***(figure 4).*** At the laboratory

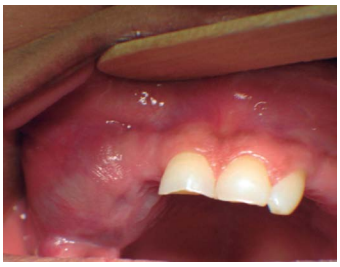

Figure 1. Rising in the intraoral volume in the upper right area.

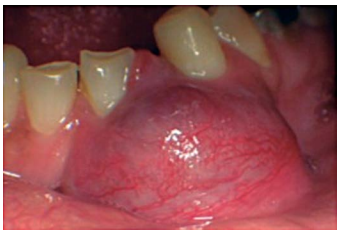

Figure 2. Rising in the intraoral volume of the lower.

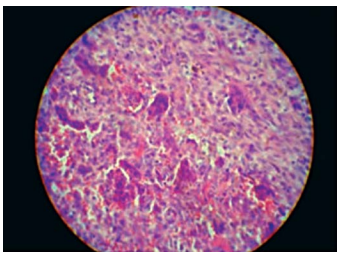

Figure 3. The orthopantomography shows multiple radiolucent and unilocular lesions, well delimited in the premolar region in the upper right maxillary in the anterior lower left and the inferior left region.

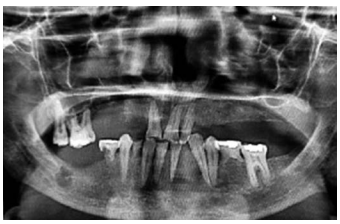

Figure 4. Multinucleate giant cells in a granulomatous stroma can be observed, with multiple vascular spaces.

Table 1. Results of laboratory tests, and possible clinical interpretation.

Blood biometry		
Cells	**Sample value**	**Reference value**
Herythrocytes	3.3 million/ml	4.20-5.40
Hemoglobin	10.6 g/dl	12.00-16.00
Hematocrit	30.90%	38.00-47.00
Leukocyte	4.6 miles/mm^3	5.00-10.00
Interpretation of blood biometry		
Hypocromic microcytic anemia		
Diminishing of the ematocrit		
Leucopenia		
Blood chemistry		
	Sample value	**Reference value**
Urea	46.00 mg/dl	15.01-42.90
Serum creatinine	2.93 mg/dl	0.70-1.50
Alkaline phosphatase	434 U/l	38.00-126.00
Serum calcium	12.5 mg/dl	8.40-10.20
Interpretation of blood chemistry		
Rising of the urea		
Hyperphosphatemia		
Hypercalcemia		

tests it is possible to observe hypocromic microcytic anemia, diminishing of the hematocrit, leucopenia, rising in the urea, hyperphosphatemia and hypercalcaemia. ***(Table 1).***

DISCUSSION

When patients with CKD have an imbalance in the parathyroid hormone, they can manifest the emergence of multiple brown tumors, due to the direct effect of the PTH on the bone tissue, the conversion of the osteogenic potential of the cells, from osteoblasts to osteoclasts, where the bone resorption prevails on the new bone tissue and the generation of osteoid tissue within the vascular fibroblast tissue begins. Therefore, intraousseous bleeding and tissue degeneration are present and give place to cysts. These cystic lesions are full of fibroblasts, giant cells and groups of macrophags containing hemosiderin. These deposits of hemosiderin are the ones that give the quality of a brown color in the lesions.[1,3,7,8]

It is important to mention that brown tumors are non-neoplastic lesions with similarities to the tumors of giant cells.[7]

The chosen treatment for these patients entails in the renal transplant for the solution of the systemic alterations. Before the presence of a giant cells' lesion, hyperparathyroidism must always be ruled out. The definite diagnosis is only possible if we compare the clinical, radiographical and histological findings. It is important to highlight the importance of an early diagnosis to avoid wider bone maladies.[8,9]

CONCLUSIONS

Systemic diseases are not unrelated to the presence of oral manifestations. In this article, we report a clinical case of a patient with chronic kidney disease and the presentation of giant cell neoplasms that affected both jaws.

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