

# Parathyroid carcinoma treated with parathyroidectomy and hemithyroidectomy

## *Carcinoma paratiroideo tratado con paratiroidectomía más hemitiroidectomía*

Raúl O. Martínez-Zarazúa<sup>1\*</sup>, Miguel Cantú-López<sup>1</sup>, Edson R. Marcos-Ramírez<sup>1</sup>, Luis A. Ceceñas-Falcón<sup>2</sup>, and Marco A. Treviño-Lozano<sup>1</sup>

<sup>1</sup>Department of General Surgery; <sup>2</sup>Department of Pathology. "Dr. José Eleuterio Gonzalez" University Hospital, Universidad Autónoma de Nuevo León, Monterrey, Nuevo Leon, Mexico

### Abstract

Parathyroid carcinoma is a very rare oncological entity, presenting insidiously in the second and fourth decades of life, characterized by hypercalcemia and hyperparathyroidism of difficult control, accompanied by general malaise, complications secondary to hypercalcemia and cervical tumor, being the main differential diagnosis of parathyroid adenoma. Complementing imaging studies of neck, scintigraphy, and contrast neck computed tomography. The diagnostic suspicion of parathyroid carcinoma is usually confirmed by the pathology of the surgical specimen. The surgery of choice is parathyroidectomy plus ipsilateral thyroidectomy. Monitoring of hypercalcemia and hyperparathyroidism is performed.

**Key words:** Parathyroid carcinoma. Hyperparathyroidism. Parathyroidectomy.

### Resumen

El carcinoma paratiroideo es una afección oncológica muy infrecuente, que se presenta de manera insidiosa en la segunda y cuarta décadas de la vida. Su clínica se caracteriza por hipercalcemia e hiperparatiroidismo de difícil control, y se acompaña de malestar general, complicaciones secundarias a la hipercalcemia y tumoración cervical, siendo el principal diagnóstico diferencial el adenoma paratiroideo. Son necesarios estudios de imagen, como ecografía de cuello, gammagrafía y tomografía computarizada de cuello con contraste. La sospecha diagnóstica de carcinoma paratiroideo usualmente se confirma con el estudio de patología de la pieza quirúrgica. La cirugía de elección es la paratiroidectomía más tiroidectomía homolateral. Se realiza seguimiento para el control de la hipercalcemia y del hiperparatiroidismo.

**Palabras clave:** Carcinoma paratiroideo. Hiperparatiroidismo. Paratiroidectomía.

### Correspondence:

\*Raúl O. Martínez-Zarazúa

Avda. Francisco I Madero, s/n

Col. Mitras Centro

C.P. 64460, Monterrey, N.L., Mexico

E-mail: raulomar1989@gmail.com

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## Introduction

Parathyroid carcinoma is an infrequent oncological entity, with an incidence of 1 case per million people<sup>1</sup>. Reporting approximately 1000 cases worldwide, in Mexico, there is little evidence of this entity, from 1968 to 2012, there are two small series reported, one of eight cases in the Hospital Siglo XXI and the other of four cases in the National Institute of Nutrition, in addition to three isolated cases<sup>2</sup>. About 90% present with excess parathyroid hormone (PTH), being a rare cause of primary hyperparathyroidism<sup>3</sup>. The clinical behavior is similar to the parathyroid adenoma, higher levels of calcium and PTH than the parathyroid adenoma characterized by intractable hypercalcemia<sup>4</sup>. The pre-operative diagnosis of carcinoma is complicated, sometimes giving diagnosis until the histopathological study of the surgical specimen, even months later at the time of recurrence of the tumor. The optimal treatment is surgery, tumor resection accompanied by ipsilateral hemithyroidectomy, it should be noted in the transoperative period that malignancy may be suspected, due to the volume of tumor, induration, and infiltration to contiguous tissues<sup>5</sup>. Subsequent revision of serum electrolytes.

## Clinical case

Female of 40 years, with a history of bilateral nephrolithiasis and pathological fracture of the right hip, internments due to fluid and electrolyte imbalance, began 2 months ago with general malaise, asthenia, adynamia, headache, nausea, and vomiting, accompanied by a 2 x 1 cm left neck tumor, of indurated characteristics, mobile, not painful, without palpable adenomegalies in the cervical region. Serum electrolyte levels hypercalcemia (Ca 21.2 mg/dl), hypokalemia (K 2.7 mmol/L), albumin 4.4 g/dl. PTH 2035 pg/ml. She performed a US neck image study reporting left thyroid lobe with normal dimensions, anterior displacement by parathyroid tumor to rule out malignancy process<sup>6</sup> (Fig. 1). It is complemented with computed tomography of the neck and thorax without evidence of tumor or adenopathy.

On suspicion of parathyroid carcinoma, resection surgery of the tumor is performed, visualize left thyroid lobe without deformities displaced by parathyroid tumor of greater volume than left thyroid lobe, thyroid and parathyroid gland are dissected, identifying recurrent laryngeal, not palpated lymphadenopathy in the

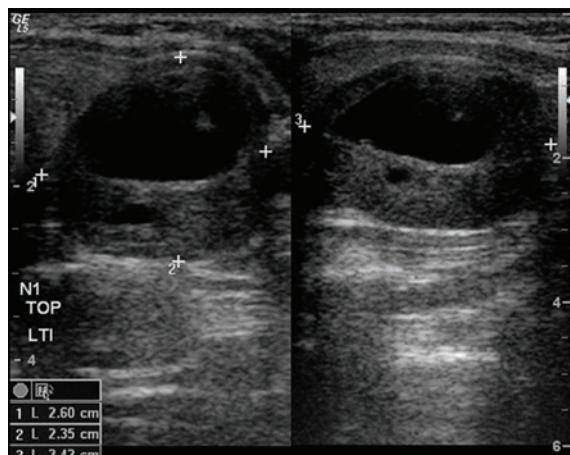


Figure 1. US neck, parathyroid tumor.

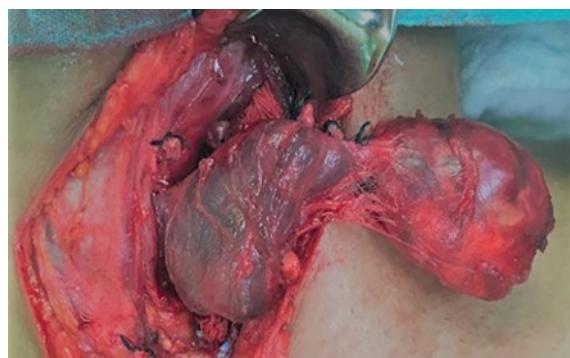


Figure 2. Surgical piece parathyroid tumor.

surgical site, posterior left hemithyroidectomy plus left parathyroidectomy<sup>7,8</sup> (Fig. 2). Patient with adequate post-operative evolution serum electrolyte controls for 72 h in hospitalization.

Pathology study describes a surgical piece to the macroscopic left thyroid lobe with normal characteristics; adjacent to it is a 3.3 cm parathyroid tumor with a central zone with cystic degeneration (Fig. 3). Microscopic criteria for malignancy were demonstrated, such as infiltration of the mushroom-shaped capsule (Fig. 4) and vascular infiltration (Fig. 5).

At present, 7 months after surgery, there is no hypercalcemia<sup>9</sup>, with monthly check-up appointments, no neck tumors, no electrolyte imbalance, or increased PTH levels.

## Discussion

Parathyroid carcinoma is a diagnostic challenge due to its rarity and resemblance to its clinical presentation with parathyroid adenoma<sup>10</sup>. The clinical presentation



Figure 3. Macroscopic sagittal view.

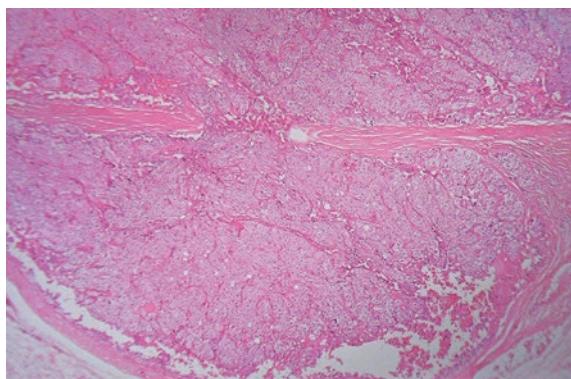


Figure 4. Microscopic capsular infiltration.

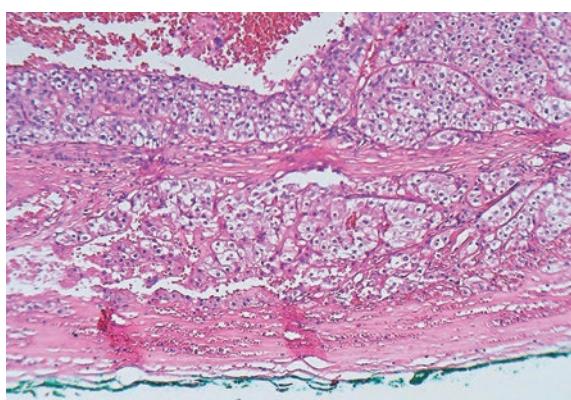


Figure 5. Microscopic vascular infiltration.

predominates hypercalcemia and hyperparathyroidism of difficult control, symptoms of malaise, asthenia, and adynamia. Complications related to hypercalcemia, in the imaging studies US neck are used where

tumoration is observed in the thyroid region, scintigraphy with hyperfunctioning nodule. It is usual to make the definitive diagnosis through the histopathological study of the tumor. Close follow-up after the intervention is necessary to monitor serum electrolyte levels, PTH, and the possible recurrence of parathyroid malignancy<sup>11</sup>.

In our case, carcinoma was highly suspected due to the clinical symptoms of hypercalcemia that was difficult to control due to endocrinology, a history related to hypercalcemia such as pathological hip fracture, and bilateral nephrolithiasis. In imaging studies (US and time-activity curves), an increase in the dimensions of the parathyroid tumor and absence of a distant tumor was demonstrated, no gamma gram was performed for economic reasons. Before the clinical presentation, it is decided to proceed to surgical treatment. A resection of the parathyroid tumor was performed in a block, no central cervical dissection was performed because adenopathies were not palpated and comorbidity was avoided, with a favorable evolution after surgery<sup>12</sup>. Diagnosis of parathyroid carcinoma is confirmed by histopathological study. Ambulatory surveillance has remained favorable with PTH and serum electrolyte controls.

## Conclusions

To date, the literature has shown the difficult diagnosis of parathyroid carcinoma, the decision of radical resection surgery of parathyroid is made by the suspicion of malignancy process, having foundations for imaging studies, the clinic at the preoperative time and post-operative.

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## Conflicts of interest

The authors declare have no they conflicts of interest.

## Ethical responsibilities

**Protection of people and animals.** The authors declare that the procedures followed conform to the

ethical standards of the responsible human experimentation committee and in accordance with the World Medical Association and the Declaration of Helsinki.

**Confidentiality of the data.** The authors declare that they have followed the protocols of their work center on the publication of patient data.

**Right to privacy and informed consent.** The authors have obtained the informed consent of the patients and / or subjects referred to in the article. This document is in the possession of the correspondence author.

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