# A RARE ASSOCIATION: PRIMARY HYPERPARATHYROIDISM AND THYROID PAPILLARY CARCINOMA. CASE REPORT

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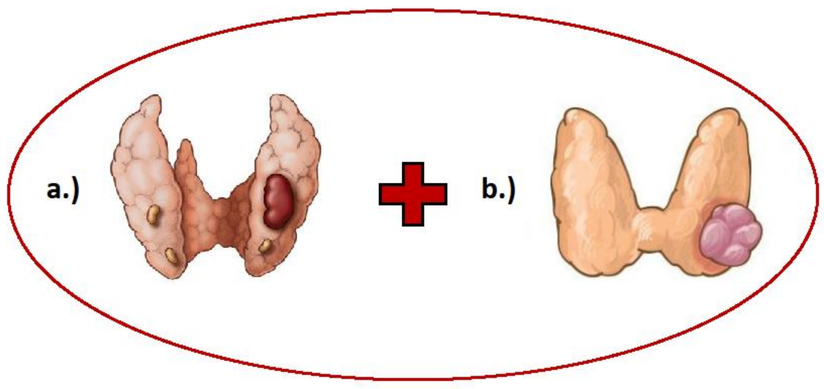
## Introduction

- Relationship between pathological processes of the parathyroid and thyroid is common (comprised in multiple endocrine neoplasia);
- Concurrence of primary hyperparathyroidism (pHPT) and papillary thyroid carcinoma (PTC) is extremely rare!!! (because they do not have a common embryologic origin);
- Reported frequencies varies in a wide range. (1-4);
- Incidence of pHPT - 27-30 per 100,000 person-years (twice as high in women and increases with age).
- Treatment of choice for pHPT is surgical (removal of the hyperfunctioning tissue), in 95% of cases they might find an affected gland (5).




**Images: (a)** Primary hiperparatiroidism. **(b)** Papilary thyroid carcinoma.

- The incidence of PTC in the United States is 7.7 per 100,000 person-years, higher in women and is an ascendant trend, mostly because of the high rate detection of occult papillary carcinomas.(6,7)
- Papillary thyroid carcinoma (PTC) is the most frequently occurring malignant tumor in thyroid pathology. It is mostly in solitary form (a single dominant nodule), but it can also occur as a multifocal lesion (8). It has an negligible impact on overall mortality (6).
- In large series, NMTC (non medullary thyroid carcinoma) was reported to be between 2.1% and 4.3% in patients subjected to surgery for PHPT (9-12).

## Case Report

❖ **Patient** - D.T., female, 67 years

❖ **Medical history**:

- 2007 - Hypertension (max SBP=180mmHg), mitral annular calcification, aortic atheromatosis, bilateral coxarthrosis;
- 2007 – Multinodular goiter (in treatment with various doses of Euthyrox, in 2012 FNAB was performed on an suspect echographic LTL nodule which resulted as benign)
- 2011 – Osteoporosis (BMD/DXA T score lumbar spine=-1,8, T score left hip neck=-1,2, T score left forearm=-3 significantly increased in line with pHPT diagnosis);
- 04.2012– High serum calcium levels (10,61mg/dl N8,4-10,2) and high PTH levels (82,64 pg/ml N15-65) raised the suspicion of hyperparathyroidism;

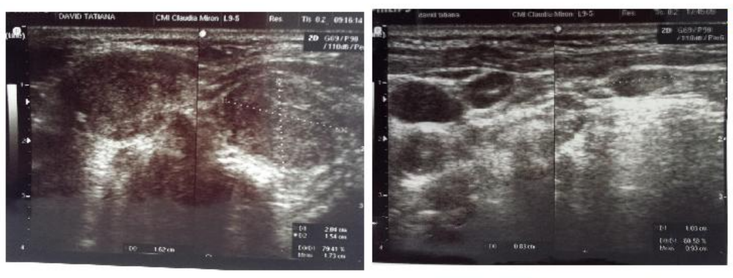
❖ **Laboratory and imaging findings :**

- 05.2012- Further investigations were made:
  - hypercalcemia was reconfirmed (10,74mg/dl N=8,4-10,2)
  - high PTH levels (119 pg/ml N15-65)
  - high ionic calcium levels (1,41mmol/l N=1,12-1,32)
  - low-normal phosphate levels (2,54mg/dl N=2,5-4,7)
  - normal urinary calcium excretion/24h (188,1mg/24h,N=100-300)
  - normal ALP levels (63 U/L N35-130)

Early stage hiperparathyroidsm

- Thyroid ultrasonography reveals conglomerate nodules occupying the area of LTL 2,7/2,3/3cm, with ill-defined hy- perechoic aspect of a necrotic area, a transonic rim surrounding the lesion, and without vascularization in Doppler mode; 1/3 superior pole of RTL a hypoechoic nodule 1/0,7/0,8cm (raised the suspicion of parathyroid adenoma);
- 99mTc-tetrofosmin dual-phase scintigraphy (early images at 10 minutes, and late images at 2h) confirmed the presence of a parathyroidian adenoma in 1/3 superior pole of RTL:

❖ a focus of intense radiopharmaceutical retention in the 1/3 superior RTL and 2/3 inferior LTL during the early acquisition phase, which correspond to the ultrasonographic findings



a. b.

**Fig.1: (a)** Ultrasonography RTL. **(b)** Ultrasonography LTL.

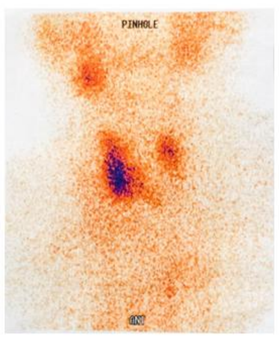



**Fig.2:** Thyroid scintigraphy.

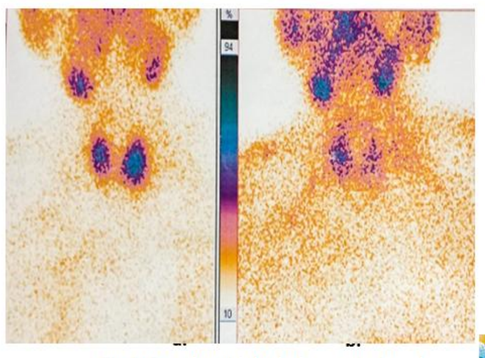


**Fig.3:** Parathyroid dual-phase scintigraphy: **a.Early phase (10 min.); b.Late phase (2h).**

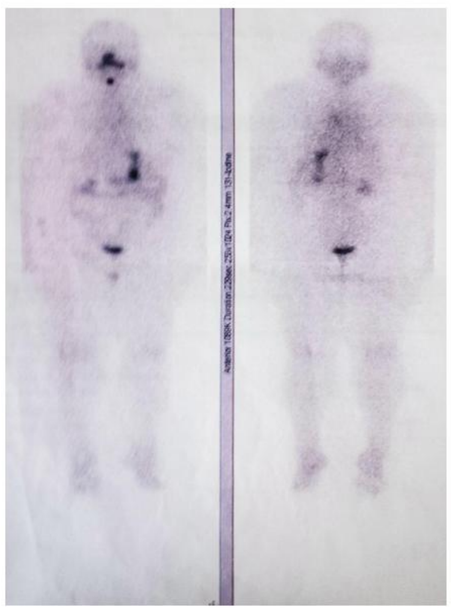


**Fig. 4:** Post-therapeutic whole body scan I-131.

normal radiopharmaceutical wash-out from 2/3 inferior LTL and the persistence of radiopharmaceutical in 1/3 superior RTL in the late acquisition phase, in conjunction with data obtained from thyroid scintigraphy, a thyroid lesion in LTL cannot be excluded.

**Surgical resection of the parathyroid adenoma was successfully performed:**

- Right superior parathyroidectomy (under general anesthesia), followed by total thyroidectomy;
- Intraoperatory the right superior parathyroid gland was hyperplasic (2,5/1cm, confirmed by the extemporaneously anatomopathological exam - diffuse adenomatous hyperplasia with principal cells and microfolicular aspects), the thyroid was enlarged with a polinodular aspect.

**Anatomopathological examination:**

- **Macroscopic**:
  1.) LTL 4/3,5/2,5cm a nodule that replaced all the normal thyroid tissue, on section with cystic degeneration and hemorrhage;
  2.) RTL 3,5/2,5/1cm, on section a pearly-white nodule of 0,6cm.
- **Microscopic:**
  1.) Multicentric thyroid papillary carcinoma, invading perithyroidian tissue pT3mNxG1;
  2.) Diffuse adenomatous hyperplasia with principal cells and microfolic-ular aspects.

Post Op

- Hyperparathyroidism was cured, with normal PTH and phosphor-calcic parameters.
- Postsurgical hypothyroidism (TSH=60,71mUI/ml, fT4=3,74pmol/l, AAT-TG low-normal values=12,28UI/ml, TG=5,3ng/ml N 1,7-55ng/ml).
- The patient receives I-131 radioiodine treatment, for the invasive PTC, a single dose of 83,16 mCi I-131 (well managed under specific anti-inflammatory and sedative treatment).
- Post-Therapeutic I-131 Whole Body Scan revealed minimum quantity of remnant thyroidi tissue.

## Discussions

- The pathophysiological mechanisms behind this association (PHPT and PTC) are not yet established.
- This case imply the need to search for this pathological association.
- Coexistent thyroid pathologies (especially papillary cancers) may have a high incidence, most of all in endemic goiter countries and raise the difficulty level of diagnosis and management of PHPT cases.
- **Thyroid examination should be carefully assessed (pre- and intraoperative) in PHPT cases.** Intraoperative examination of the thyroid gland has a sensitivity and specificity (*surgeon-dependent*) which varies between 96% and 100%. Nevertheless the ascendant trend of minimally invasive parathyroidectomy is rapidly undermining this practice.
- Same session thyroid surgery should be made frequently when required.

## Conclusions

❖The case illustrates an extremely rare synchronous association of primary hyperparathyroidism with thyroid carcinomas -> an incidence roughly estimated at 0.0023/100,000 person/ year.

❖In spite of its rarity, this coexistence of pHPT and PTC maybe not a random but a possible new pathology.

❖The concurrence of both pathological processes can make the patient management complicated; unrecognized thyroid cancer diagnosed at the histological examination implies surgical re-intervention.

**References:** 1-Incidental papillary thyroid carcinoma with primary hyperparathyroidism: two cases, Khyatisha Seejore, et. al., Endocrine Abstracts 2013; 2-Detection of Thyroid Carcinoma During Surgical Exploration of the Neck for Primary Hyperparathyroidism, Mohammad Zadeh F, et. al., Int. J. Endo. Metab., 2007; 3-Primary hyperparathyroidism and incidental multifocal metastatic papillary thyroid carcinoma in a man, Stergios A. Polyzos, et. al., Arq Bras Endocrinol Metab. 2010; 4-Three cases of primary hyperparathyridism associated with non medulary thyroid carcinoma, Masao Tanaka, et. al., Internal Medicine, 1995; 5-Hyperparathyroidism, Fraser WD, et. al. Lancet. 2009; 6-Thyroid nodules - Stepwise diagnosis and management, Polyzos SA, et. al., Hormones (Athens), 2007; 7-Increasing prevalence of papillary thyroid carcinoma in recent years in Greece: the majority are incidental., Alevizaki M, et. al., Thyroid. 2009; 8-Increasing incidence of thyroid cancer in the United States,Davies L., et. al., 1973-2002. JAMA. 2006; 9-Thyroid carcinoma found at parathyroidectomy: association with primary, secondary, and tertiary hyperparathyroidism.,Brumestier LA., et. al.,Cancer. 1997; 10-Primary hyperparathyroidism and malignancy: "studies by nature".,Cinamon U., et. al., Bone. 2006; 11-Is preoperative investigation of the thyroid justified in patients undergoing parathyroidectomy for hyperparathyroidism?,Bentrem DJ., et. al., Thyroid. 2002; 12-Association of hyperparathyroidism with nonmedullary thyroid carcinoma: review of 31 cases, Attie JN., et.al.,.Head Neck. 1993;



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