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).

- 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 of 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 (9).
- In large series, NMTC (non medullary thyroid carcinoma) was reported to be between 2.1% and 4.8% 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 coarctosis;
  - 2007 – Multinodal goiter (in treatment with various doses of Ethioxyn, in 2012 FNAB was performed on a suspect echocographic LTL nodule which resulted as benign);
  - 2011 – Osteoporosis (BMD/DXA T score lumbar spine=1.6, T score left hip neck=-1.2, T score left femur=-3 significantly increased in line with pHPT diagnosis);
  - 04.2012 - High serum calcium levels (10.61mg/dl N 8.4-10.2) and high PTH levels (82.64 pg/ml N 15-55) raised the suspicion of hyperparathyroidism;
- Laboratory and imaging findings:
  - 05.2012 - Further investigations were made:
    - hypercalcemia was reconfirmed:
      - high PTH levels (107.4ng/ml N 8.4-10.2)
      - high ionic calcium levels (1.41mmol/l N 1.14-1.22)
    - low-normal phosphate levels (2.5mg/dl N 2.5-4.7)
    - normal urinary calcium excretion (24hr):
      - 148mg N 100-300
    - normal ALP levels (63 U/L N 35-130)
- Early stage hyperparathyroidism:
  - Thyroid ultrasound reveals conglomerate nodules occupying the area of LTL 2.7/2.3/0.8cm, with ill-defined hypo-hyperdense aspect of a necrotic area, a transonic rim surrounding the lesion, and without vasculatization in Doppler mode; 1/3 superior pole of RTL, a hyperchoic nodule (1/3/0.8cm) raised the suspicion of parathyroid adenoma);
  - 99mTc-tetrofosmin dual-phase scintigraphy (earliest images at 10 minutes, and later images at 2h) confirmed the presence of a parathyroid 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.

- Surgical resection of the parathyroid adenoma was successfully performed:
  - Right parathyroidectomy (under general anesthesia), followed by total thyroidectomy;
  - Intraoperative the right superior parathyroid gland was hypoplastic (2.5/cm), confirmed by the expeceeroma of patholopathologic exam - diffuse adenosomatous hyperplasia with principal cells and microfollicular aspects), the thyroid was enlarged with a polinodular aspect.

Anatomopathological examination:
- Macroscopic:
  1) LTL 4.0/3.5/2.5cm a nodule that replaced all the normal thyroid tissue, on section with cystic degeneration and hemorrhage;
  2) RLT 3.5/2.5/1cm, on section a pearly-white nodule of 0.6cm.
- Microscopic:
  1) Multinodular thyroid papillary carcinoma, invading perithyroid tissue (pN3N2a);
  2) Diffuse adenomatous hyperplasia with principal cells and microfollicular aspects.

- Hyperparathyroidism was cured, with normal PTH and phosphocalcic parameters.
- Post-surgical hypothyroidism (TSH=60.71muIU/ml, FT4=3.74pmol/l, AAT-TG low-normal values=12.28uIU/ml, TG5=1.3ng/ml N 1.7-5.5ng/ml).
- The patient receives L-131 radiodine treatment, for the invasive PTC, a single dose of 85.16mcI [I-131] (well managed under specific anti-inflamatory and sedatative treatment).
- Post-Therapeutic [I-131] Whole Body Scan revealed minimum quantity of remnant thyroid tissue.

Discussion

- The pathophysiologic mechanisms behind this association (PHPT and PTC) are not yet established.
- This case imply the need to search for this pathologic association.
- Consistent thyroid pathologies (especially papillary carcinomas) 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 underlining 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 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

- [4] [I-131] Iodine-131 Therapy. 2 references with full text in English (as cited in the text).