Interesting image
Incidental detection of Hürthle cell adenoma by $^{18}$F-choline PET/CT scan in a patient with prostate cancer

Hallazgo casual de adenoma de células de Hürthle en un estudio PET/TC con $^{18}$F-colina en paciente con cáncer de próstata

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A R T I C L E   I N F O

Article history:
Received 10 April 2013
Accepted 18 April 2013
Available online 22 June 2013

A 64-year-old male patient with increased serum level of prostate-specific antigen (23 ng/ml) and histological diagnosis of prostate cancer (Gleason score: 9) underwent $^{18}$F-choline PET/CT for staging.

PET/CT images detected multiple areas of abnormal radiopharmaceutical uptake corresponding to the primary prostate tumor and several lymph nodal and bone metastases (Fig. 1). Furthermore, PET/CT scan showed an area of increased $^{18}$F-choline uptake corresponding to a 3.5 cm hypodense nodule in the right thyroid lobe at the co-registered CT scan (Fig. 2).

Based on these PET/CT findings, the patient underwent a neck ultrasonography (US) and a US-guided fine-needle aspiration of the right thyroid nodule with indeterminate outcome and subsequent thyroid lobectomy. Histology examination revealed the presence of a Hürthle cell adenoma (Fig. 3).

![Figure 1](image1.png)

**Fig. 1.** Whole-body maximum intensity projection PET image (A) showed multiple areas of abnormal $^{18}$F-choline uptake (arrows). PET/CT images in axial projection demonstrated increased $^{18}$F-choline uptake (yellow arrows) corresponding to the prostate tumor (B), multiple metastases to the left iliac (C), mediastinal and right hilar pulmonary (D,E) lymph nodes and skeletal metastases in the left iliac bone (F) and the sixth cervical vertebra (G).
Thyroid incidentalomas (TIs) are defined as unexpected thyroid lesions incidentally discovered on an imaging study or during an operation unrelated to the thyroid gland. TIs are detected in several ways using different imaging modalities. Several studies have reported the prevalence and the malignancy risk of TIs detected by $^{18}$F-fluorodeoxyglucose ($^{18}$F-FDG) PET/CT.\(^1\)

On the other hand, to date, the prevalence and clinical significance of incidental radiolabelled choline uptake in the thyroid gland is not clear.

The incidental diffuse uptake pattern of $^{18}$F-choline in the thyroid gland has been already described being often correlated to thyroiditis.\(^2\) Furthermore, a previous study demonstrated that malignant thyroid tumors may take up radiolabelled choline due to an increased choline metabolism.\(^3\)

Our case highlights that also Hürthle cell adenoma may take up radiolabelled choline and, to the best of our knowledge, this is the first case reported in the literature which demonstrates this finding.

As for $^{18}$F-FDG, further investigations, such as US and histopathology examination when needed, are suggested to better characterize the benign or malignant process underlying the incidental radiolabelled choline uptake in the thyroid gland.

Fig. 2. PET/CT scan in axial (A), sagittal (B) and coronal projection (C) also demonstrated an area of increased $^{18}$F-choline uptake (red arrows) corresponding to a 3.5 cm hypodense nodule in the right lobe of the thyroid gland (D).

Fig. 3. Ultrasonography (US) showed a large rounded nodule (diameter was 3.5 cm) in the right thyroid lobe. Color Doppler examination showed perinodular and intranodular vascular signals (A and B). The patient underwent fine-needle aspiration of the right thyroid nodule with indeterminate outcome and subsequent thyroid lobectomy. Histology examination revealed the presence of a Hürthle cell adenoma (C).

References