

# WHICH DIAGNOSTIC APPROACH IS BETTER FOR EVALUATION OF THYROID NODULES IN CANCER PATIENTS? FINE NEEDLE ASPIRATION BIOPSY OR -FLUORO-2-DEOXY-D-GLUCOSE-POSITRON EMISSION TOMOGRAPHY

Birsen Ünsal Koyuncu<sup>1</sup>, Elif İnanç Gürer<sup>2</sup>, Ramazan Sarı<sup>1</sup>

<sup>1</sup>Akdeniz University, School of Medicine, Department of Internal Medicine, Division of Endocrinology and Metabolism, Antalya

<sup>2</sup>Akdeniz University, School of Medicine, Department of Pathology, Antalya

## ABSTRACT

As curableness and survival rate are increased with modern cancer treatment approaches, the frequency of second primer tumor disease has also increased especially elderly patient. Although coexistence of other primary malignancies is relatively higher, thyroid carcinoma is not one of the most common cancers in patients with renal cancer. We reported that thyroid carcinoma was detected as a result of the evaluation of incidental thyroid nodule which was false negative fine needle aspiration and positive involvement in [<sup>18</sup>F]-2-fluoro-2-deoxy-D-glucose-positron emission tomography/Computed tomography in patients who were

diagnosed with renal cell carcinoma for three years. In conclusion; it should be kept in mind that fine needle aspiration biopsy can be false negative for the evaluation of thyroid nodule. The focal involvement in thyroid [<sup>18</sup>F]-2-fluoro-2-deoxy-D-glucose-positron emission tomography/Computed tomography a high risk of malignancy, especially in cases with high maximum standardized uptake values.

**Keywords:** Second primary neoplasms, thyroid cancer, fine needle biopsy, [<sup>18</sup>F]-2-fluoro-2-deoxy-D-glucose-positron emission tomography/Computed tomography *Nobel Med 2015; 11(3): 77-79*

## KANSERLİ HASTALARDA TİROİD NODÜL DEĞERLENDİRİLMESİNDE HANGİ YAKLAŞIM DAHA İYİDİR? İNCE İĞNE ASPİRASYON BİYOPSİSİ YA DA FLUORO-2-DEOXY-D-GLUCOSE-POZİTRON EMİSYON TOMOGRAFİSİ

### ÖZET

Modern kanser tedavi yaklaşımları ile kürabilite ve sağ kalım arttığı için özellikle yaşlı hastalarda tedavi sonrası ikinci primer tümör görülme sıklığı da artmıştır. Renal kanserli hastalarda eş zamanlı diğer malignitelerin görülme sıklığı göreceli olarak yüksek olmasına karşın tiroid kansinmaları sık görülen eş zamanlı kanserler-

den birisi değildir. Burada 3 yıldır renal hücreli kanser nedeniyle takip edilen hastada yanlış negatif sonuç veren ince iğne aspirasyon biyopsisi ve pozitif PET/CT tutulumu ile saptanan tiroid karsinoma vakası sunuldu. Sonuç olarak tiroid ince iğne aspirasyon biyopsisinin yanlış negatif sonuç verebileceği unutulmamalıdır. Özellikle maksimum standardize uptake değerleri yüksek olan hastalarda tiroid tutulumu malignite açısından yüksek risklidir.

**Anahtar kelimeler:** İkinci primer kanser, tiroid kanseri, ince iğne aspirasyon biyopsisi, [<sup>18</sup>F]-2-fluoro-2-deoxy-D-glucose-positron emission tomography/Computed tomography. *Nobel Med 2015; 11(3): 77-79*

## INTRODUCTION

Multiple primary cancer is defined as two or more cancers a single patient. A previous study defined the incidence of multiple primary cancers as 1.8-11% of all cancers.<sup>1,2</sup> It is reported in various studies that the coexistence of renal cell carcinoma and other primary malignancies is relatively higher.<sup>3-5</sup> However, thyroid carcinoma is not one of the most common cancers in patients with renal cancer.

Incidental thyroid nodules are detected during the radiological tests which are not directly aimed at thyroid. The major problem is a malignancy risk in thyroid nodules. Rapidly progression, irregular margins, intranodular vascular spots, hypoechoic appearance and microcalcifications were independent risk factors of malignancy in thyroid nodules.<sup>6</sup> Although false negatives cannot be excluded, fine needle aspiration biopsy (FNAB) plays a crucial role in the diagnosis of thyroid nodules.<sup>7</sup>

Recently, the widespread use of [<sup>18</sup>F]-2-fluoro-2-deoxy-D-glucose-positron emission tomography/Computed tomography (FDG-PET/CT) in cancer patients have made it possible to diagnose clinically silent secondary primary malignancies.<sup>8,9</sup> The focal thyroid FDG-PET/CT incidenteloma carries a high risk of malignancy, especially in cases with high maximum standardized uptake values (SUVmax).

We reported that thyroid carcinoma was detected as a result of the evaluation of incidental thyroid nodule which was false negative fine needle aspiration and positive involment FDG-PET/CT in patients who were diagnosed with renal cell carcinoma for three years.

## CASE

A patient, 65 year old male, had left nephrectomy because of renal masses and he was diagnosed with clear cell renal carcinoma. As he was being followed for renal cell carcinoma, hypermetabolic nodule (SUVmax: 6,3) was detected after the evaluation of thorax tomography and following FDG-PET/CT at the third year of disease. As a result, he was sent to our clinic and he had no history of goiter. The thyroid nodule was palpated 5x5 cm diameter in the left lobe and diameters were calculated as 6x5x5 cm in ultrasonographic evaluation. Thyroid function tests were normal. Twice FNAB were performed on this nodule. Its cytology came as once poor and once benign. However, as the nodule has trachea press and there is an involvement in FDG-PET/CT, thyroidectomy was performed. Its pathologic diagnosis was thyroid carcinoma with hurtle cell (Figure). Ablation therapy for thyroid cancer, and

afterwards thyroxine treatment for TSH suppression were planned.

## DISCUSSION

Cancer patients have the risk of developing a new primary cancer with a rate of 5-8% in their later lives.<sup>2</sup> Improved diagnostic techniques and increased elderly patient populations have also been indicated as possible causes. Although the mechanism for the pathogenesis of multiple primary cancer has yet to be clarified, some factors such as heredity, constitution, and environment, and immunology and carcinogens (viruses, radiotherapy and chemical treatments) have been implicated.

The incidence of secondary primary malignancy is defined as 4.5-40% in patients with renal cell carcinoma.<sup>3-5</sup> Beisland et al. reported that cancer in the prostate, bladder, lung, breast, colon and rectal cancer, malignant melanomas and non-Hodgkin's lymphomas are the most common other malignancies in patients with renal cancer. Thyroid cancer has been diagnosed in only 9 of 287 (3.1%) patients in their study.<sup>5</sup>

The most common clinical presentation of thyroid cancer is a thyroid nodule. The malignancy rate of thyroid nodule which was incidentally detected in routine imaging test during the disease (especially computed tomography) is found as high as 24% as well as the malignancy rate of nodules which were detected by traditional methods is more than 5%.<sup>10</sup> Rapidly progression, high diameter of nodules, irregular margins, intranodular vascular spots, hypoechoic appearance and microcalcifications were independent risk factors of malignancy in thyroid nodules.<sup>6</sup> FNAB is a gold standart and plays a crucial role in the diagnosis of thyroid nodules and theoretically, FNAB should be carried out on all nodules. In 70 to 80% of the cases, nodules can be classified as benign or malignant with a 92% negative predictive value for a benign diagnosis and a 100% positive predictive value for a diagnosis of cancer. Therefore, false negatives cannot be excluded, like the present case, while false positives are practically nil.<sup>7</sup>

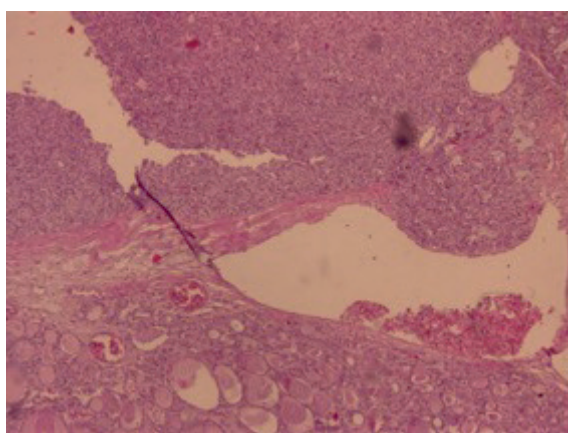
Recently, FDG-PET/CT imaging has been used extensively in the diagnostic work-up and the follow-up of a variety of cancers in medicine and oncology clinics. The use of FDG-PET/CT in the management of thyroid disease has been limeted primarily to the postoperative surveillance of patients with known differantiated thyroid carcinoma. Finally, thyroid FDG-PET/CT thyroid incidentelomas are identified on approximateley 1 to 2% of FDG-PET/CT studies and harbor a 14 to 47% chance of being confirmed as malignant. Currently, there is no routine place for

FDG-PET/CT in their evaluation of a thyroid nodules. Moreover, diagnostic and predictive values of FDG PET/CT for differentiation of incidentally detected thyroid nodules are controversial.<sup>8,9</sup> On the other hand, the focal thyroid FDG-PET/CT incidentaloma carries a high risk of malignancy, especially in cases with high SUVs which is similar in our patient. The size and visual grade are potential predictors for malignant thyroid incidentaloma.<sup>9</sup>

Large nodule diameter, substernal localization and trachea compression were detected in our case. Although result of fine-needle aspiration was determined as benign, because of the involvement in FDG-PET/CT thyroidectomy was performed and thyroid carcinoma was diagnosed in our patient.

## CONCLUSION

The possibility that multiple primary malignancies included thyroid cancer exist must always be considered following cancer patients. It should be kept in mind that FNAB can be false negative for the evaluation of thyroid nodule especially in patients



**Figure.** Thyroid carcinoma with Hurthle cell\*

\*: Hematoxylin and eosin stain x50

with cancer. In addition, the focal involvement in thyroid FDG-PET/CT a high risk of malignancy, especially in cases with high SUVmax. Further studies are required to compare the diagnostic and predictive values of fine needle aspiration and FDG-PET/CT for thyroid nodule in cancer patients.

\* The authors declare that there are no conflicts of interest.

<b>C</b>	<b>CORRESPONDING AUTHOR:</b> Ramazan Sari Akdeniz Uni., School of Medicine, Dept. of Internal Medicine, Division of Endocrinology and Metabolism, Antalya. <a href="mailto:drsari@hotmail.com">drsari@hotmail.com</a>
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