Interesting image

Synchronous triple thymoma and true thymic hyperplasia simultaneously detected by $^{18}$F FDG PET-CT

Timoma triple sincrónico e hiperplasia tímica verdadera detectada mediante PET/TAC con $^{18}$F-FDG

G. Leuzzi $^{a,*}$, M. Marino $^{b}$, G. Alessandrini $^{a}$, R. Sciuto $^{c}$, E. Pescarmona $^{b}$, F. Facciolo $^{a}$

$^{a}$ Department of Surgical Oncology, Thoracic Surgery Unit, Regina Elena National Cancer Institute – IFO, Rome, Italy
$^{b}$ Division of Pathology, Regina Elena National Cancer Institute – IFO, Rome, Italy
$^{c}$ Division of Nuclear Medicine, Regina Elena National Cancer Institute – IFO, Rome, Italy

A 56-years-old Caucasian woman was admitted to our Department for evaluation of mediastinal enlargement detected during investigations for angor and long-lasting dyspnoea. A non-contrast enhanced chest CT scan evidenced multiple swellings in the anterior mediastinum making a proper radiological evaluation of the mediastinum unfeasible. Thus, a $^{18}$F-FDG PET-CT-scan was performed and revealed a round-shaped lesion in the upper mediastinum (1.8 cm, SUV 4.0, Fig. 1A–D), a lower lesion (3.0 cm, SUV 4.8, Fig. 1C–E) and a round irregularly-shaped nodule (1.4 cm) between the two ones (SUV 3.0, Fig. 1B–E). In addition, the thymus gland uptake was increased (SUV of 2.8, Fig. 2) while the $^{18}$F-FDG distribution was slightly decreased in the cardiac muscle (due to a Tako Tsubo syndrome subsequently confirmed by cardiac examination). Considering the different mediastinal uptakes, cytology was obtained by fine-needle aspiration biopsy (FNAB) of the upper lesion and was suggestive for thymoma. Thus, the patient underwent a trans-sternal radical thymectomy plus wedge resection of the left upper lobe. Final pathology characterized the three lesions as different nodules of type AB thymoma: in particular, the lower (Fig. 3A) and medium nodule (Fig. 3C) were encapsulated (Masaoka-stage I), while the upper one (Masaoka-stage III) invaded the visceral pleura (star, Fig. 3B). Moreover, the thymic parenchyma was consistent with true thymic hyperplasia (TTH, Fig. 3D). Based on the histo-pathological findings, a diagnosis of synchronous triple AB thymoma (with different Masaoka staging) associated to TTH was achieved.

Multiple thymoma has been rarely reported and its incidence in large series ranges from 0 to 3.1%. In the English literature, most cases have involved double lesions, while diagnosis of triple lesions is anecdotic.

Actually, it is controversial whether cases of multiple thymoma represent multi-centric origin or intra-thymic metastases. Some authors$^{2}$ reported histologically similar subtype of tumours and suggested that such lesions were synchronous with a multi-centric origin (due to non-invasiveness and other histological features) even if the possibility of intra-thymic metastasis could not be completely ruled out. In our case, the lesions were detached and totally (medium and lower lesion) or partially encapsulated (upper one); in addition, the TTH could have set a suitable environment for the growth of cancer cells. According to these evidences, we postulated the multi-centric origin of the three lesions.

In conclusion, in those cases with multiple mediastinal lesions, $^{18}$F-FDG PET-CT may be useful to characterize metabolically the nodules in order to plan the optimal preoperative assessments (FNAB, surgical biopsy or primary surgery). In addition, $^{18}$F-FDG PET-CT is effective for the preoperative diagnosis of synchronous thymic lesions and for identifying underlying thymic disease (TTH e.g.$^{1}$) as possible cause of thymoma.

Fig. 1. Contrast-enhanced computed tomography scan (axial slices) and whole body PET/CT performed 1 h after the administration of 296 MBq of $^{18}$F-FDG (coronal slices). The CT scan revealed a round shaped lesion in the upper anterior mediastinum measuring 1.8 cm in the major axis (A), a lower mediastinal lesion of 3.0 cm (C) and a round irregularly shaped nodule (1.4 cm) between the two ones (B). The PET-CT images characterized the upper lesion with a SUV of 4.0, the lower one of 4.8 and the medium lesion of 3.0 (D–E).

Fig. 2. Whole body PET/CT performed 1 h after the administration of 296 MBq of $^{18}$F-FDG (axial, coronal and sagittal slices). In our case, the PET-CT scan had a multi-faceted role: in fact, the exam revealed an increased uptake of the thymus gland (SUV of 2.8) due to the true thymic hyperplasia. On the contrary, a slightly reduced uptake at the cardiac muscle was disclosed (due to a Tako Tsubo syndrome subsequently confirmed by cardiac examination).
Fig. 3. Macroscopic findings: thymus gland measuring 9 cm × 6 cm. The larger lesions (upper and lower ones) are visible in the picture. The white arrow indicates the pulmonary resection due to lung invasion by the upper nodule. Morphological features of the triple thymoma and peri-tumoral thymus. (A–C) three distinct thymoma nodules with AB thymoma features, according to WHO classification. (A) Lower nodule (Haematoxylin and eosin, original magnification ×100); (B) upper nodule (Haematoxylin and eosin, original magnification ×200); (C) intermediate smaller nodule (Haematoxylin and Eosin, original magnification ×200). The star indicates the visceral pleura invasion by the upper lesion. Despite of zonal variation in lymphocytic content, the tumours showed the same histologic subtype. (D) Peri-tumoral thymus appeared well represented and hyperplastic in the adipose tissue of the remnant thymus, confirming diagnosis of true thymic hyperplasia (Haematoxylin and eosin, original magnification ×100).

Conflict of interest

None.

Acknowledgments

None.

References