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A RARE CASE REPORT: PRIMARY MEDIASTINAL NEUROENDOCRINE TUMOR

Pulmonary Medicine

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KEYWORDS

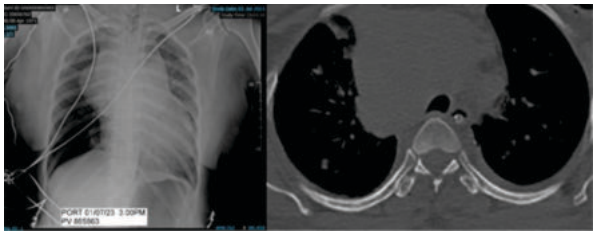
INTRODUCTION

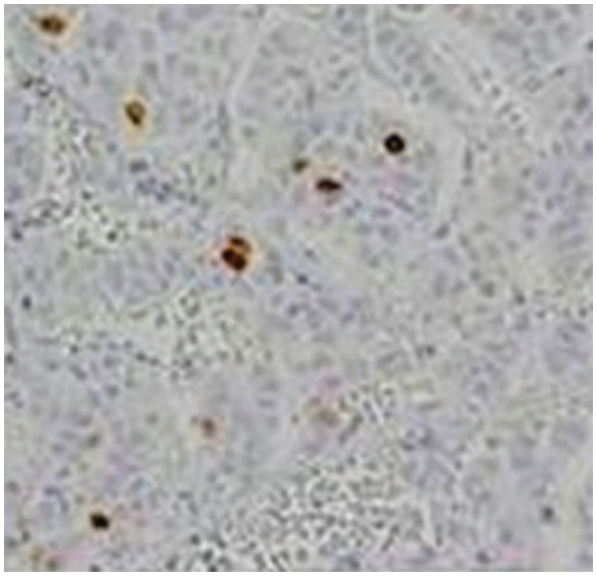
Neuroendocrine tumours are the epithelial glands with the most neuroendocrine differentiation, occurring in most parts of the body. Mediastinal neuroendocrine tumours are rare, accounting for less than 5% of all mediastinal masses. Common NETs of the mediastinum include thymic neuroendocrine carcinomas, aortopulmonary and paravertebral paragangliomas, and ectopic or redundant parathyroid tumours. Mediastinal primary NETs have become controversial in the literature due to ongoing debates regarding their origin, nomenclature, and classification. Although there are many treatment options, side effects are generally not good.

Primary mediastinal neuroendocrine tumour (PMNET) is a rare entity with few descriptions in the literature. Thus, we report for review the case of a 52-year-old female with a primary tumour of the anterior upper mediastinum diagnosed histologically as a neuroendocrine tumour, grade 1.

Case Report

A 52-year-old female non-smoker, without a significant previous medical history, came with the complaints of generalised weakness with shortness of breath & chest tightness for 1 month. She was also having difficulty swallowing and facial puffiness for 15 days.On examination, she was afebrile, her blood pressure was 128/76 mm Hg, her pulse was 98 beats per minute, her respiratory rate was 20 breaths per minute, and her oxygen saturation was 70% on room air and 94% on 4 L/min oxygen with a nasal prong. There was no evidence of finger clubbing, cervical lymphadenopathy, or jaundice.Abdominal examination was unremarkable.In an emergency, basic laboratory and radiological investigations were done. The patient's chest x-ray was suggestive of mediastinal widening, and she was having type 1 respiratory failure in blood gas analysis. Other lab parameters, haemoglobin, leucocyte count, and CRP, were normal. The patient was advised to have contrast- enhanced chest computed tomography, which showed a large anterior mediastinal mass measuring 9.7 x 9.3 x 12 cm in size.The EBUS-FNAC report is suggestive of neoplastic pathology. USG-guided biopsy through the anterior chest showed sheets of tumour arranged in a nesting pattern. Tumour cells have scant cytoplasm, mild pleomorphism, and granular chromatin. No mitosis or necrosis is seen, and the IHC marker showed Chromogranin A (LK2H10) positive and TTF-1 negative, suggestive of Neuroendocrine tumour, grade 1. And also revealed a high-grade NET (Ki67 15%).PET CT was suggestive of a metabolically active large mediastinal mass encasing, splaying, and narrowing the mediastinal vessels and bilateral main bronchi with other extensions and other smaller mediastinal nodes without metastases. After a multidisciplinary meeting, the mass was judged to be inoperable in view of extensive vascular, airway, and cardiac involvement.After discussion with the medical oncology team, the patient was scheduled to undergo neoadjuvant chemotherapy with capecitabine and temozolomide (CAPTEM). Injection somatostatin was also given. After 3 cycles of chemotherapy, a repeat CT scan showed a reduction in size of the mass. The patient clinically improved on hydrotrach with 1-2 litres of oxygen support and intermittent BiPAP support. Facial and limb swelling reduced, sensorium has improved, and is tolerating oral feeds.





Immunohistochemistry analysis of tumor tissue. Ki67 =15%

DISCUSSION

Neuroendocrine tumour (NET) is an epithelial tumour with mainly neuroendocrine differentiation, occurring in most parts of the body [1]. Primary NET of the mediastinum is very rare [2].Current 2015 WHO, tumors isolated from the lung, pleura, thymus and heart tumors, cell It provides diagnostic crite ria for NETs based on histopathological features such a morphological features, growth pattern, mitotic rate, and pr esence of necrosis.[3] Tumors with these neuroendocrine morphologies are often divided into high-grade malignancies, SCC and large cell neuroendocrine carcinoma (LCNEC), low- grade classical carcinoid (TC), and intermediate-grade AC necrosis, based on their number, presence or absence of mitosis, and chromogranin A, synaptophysin, and CD56[4]

Grade	Lung and Thymus (WHO)[34]	GEP-NETs (ENETS)[28,29]	GEP-NETs (WHO 2010)[3]	Lung and Thymus (Moran et al)[23]	Pancreas (Hochwald et al)[24]
Low grade	Carcinoid tumor	Neuroendocrine tumor, grade 1 (G1)	Neuroendocrine neoplasm, grade 1	Neuroendocrine carcinoma, grade 1	Well-differentiated pancreatic endocrine neoplasm, low grade
Intermediate grade	Atypical carcinoid tumor	Neuroendocrine tumor, grade 2 (G2)	Neuroendocrine neoplasm, grade 2	Neuroendocrine carcinoma, grade 2	Well-differentiated pancreatic endocrine neoplasm, intermediate grade
High grade	Small cell carcinoma	Neuroendocrine carcinoma, grade 3 (G3), small cell carcinoma	Neuroendocrine carcinoma, grade 3, small cell carcinoma	Neuroendocrine carcinoma, grade 3, small cell carcinoma	Poorly differentiated pancreatic endocrine carcinoma, small cell carcinoma
	Large cell neuroendocrine carcinoma	Neuroendocrine carcinoma grade 3 (G3), large cell neuroendocrine	Neuroendocrine carcinoma, grade 3, large cell neuroendocrine carcinoma	Neuroendocrine carcinoma, grade 3, large cell neuroendocrine carcinoma	Poorly differentiated pancreatic endocrine carcinoma, large cell neuroendocrine carcinoma

The grade of the tumor MUST be included in the pathology report, along with a reference to the specific grading system being used. Unqualified terms such as *neuroendocrine tumor* or *neuroendocrine carcinoma* without reference to grade do not provide adequate pathology information.

Detects immunohistochemical markers such as Clinically, most patients are asymptomatic. When present, symptoms may be due to compression or invasion of adjacent intrathoracic organs or may be related to the ability of the tumor to produce hormones or cytokines [5]. There are some differences in etiology (e.g. role. Smoking), epidemiology and genetics, and the names of tNETs tra ditionally follow pulmonary differentiation. It does. Therefore, in the latest classification of tumors of the lung, pleur a, thymus and heart by the World Health Organization (WHO), neuroendocrine tumors of the thymus and lung are di vided into typical (low grade) and atypical (intermediate grade) Carcinoid, Large Cell. Neuroendocrine Carcinoma (LCNEC) [6].On one side, there are "low/moderate" exposure and atypical carcinoids (TC and AC), and "high grade" LCNEC and SCC are considered unrelated tumours. Overlap: The features do not represent the level of differentiation.Although the treatment of choice for ACs is .[7] the tumor recurrence rate averages 5%. and 30%, higher in patients w ith AC and mediastinal lymph node involvement (65%)[8] . For this reason, although its effectiveness cannot be fully established, medication and/or thorax treatment is recommended. Various hormonal receptors, such as somatostatin, have been identified in NETs with diagnostic, prognostic and therapeutic implications due to their high receptor bin ding affinity [9]. Somatostatin analogues such as octreotide and similar derivatives such as lanreotide are anti- inflammatory drugs, but they show good results in symptom control .[7] It requires careful morphological and immun ohistochemical analysis. features. TC and AC cannot be reliably distinguished by cytology, but AC may be suspecte d if necrosis or mitosis is present. If the Ki-67 marker shows significant activity, this helps exclude low-grade NETs. [10]Additionally, Ki-67 antigen can be used effectively in the preparation of cell blocks to prevent misdiagnosis of benign NETs, although this method is unreliable in distinguishing TC from AC of conventional smears. In all cases, all cytomorph ological and immunocytochemical features allowed us to diagnose tumors with neuroendocrine features. In the prese nt case, the tumor was diagnosed as PMNET-AC because there was no evidence of thymic or parathyroid involvement or Sertoli cells in the lesion.

CONCLUSION

Accurate diagnosis of PMNETs is critical to the patient's treatment and long-term survival, but these tumors often have a poor prognosis. Moreover, regardless of the cytopathologist's expertise, the diagnosis of atypical carcinoid tumors by cytology alone is difficult and requires careful histological and immun ohistochemistry.Mediastinal NETs are often aggressive, but our patient demonstrates that even in the setting of advanced local disease, multidisciplinary treatment can achieve the ultimate goal and lead to a long life. Further studies are needed to elucidate the histogenesis and origin of these tumours.

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