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Case report

Primary nodal anthracosis identified by EBUS-TBNA as a cause of FDG PET/CT positive mediastinal lymphadenopathy

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ABSTRACT

Isolated mediastinal lymphadenopathy can result from a number of potentially serious aetiologies. Traditionally those presenting with mediastinal lymphadenopathy would undergo mediastinoscopy to elucidate a final diagnosis or receive empirical treatment. There is now increased utilization of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA), in this setting.

Five cases of mediastinal lymphadenopathy are presented here in which lymph node anthracosis was identified as the primary diagnosis using EBUS-TBNA. They were female, non-smokers presenting with non-specific symptoms, who retrospectively reported cooking over wood fires. Four were from South Asia. Three were investigated by F-18-fluorodeoxyglucose positron emission tomography/computed tomography (FDG PET/CT) scanning and increased signal was identified in the anthracotic nodes sampled.

With expansion of PET/CT and EBUS-TBNA services it is likely that primary nodal anthracosis will be encountered more frequently and should be considered in the differential diagnosis of those with PET/CT positive lymphadenopathy. It may mimic pathologies including tuberculosis and malignancy, thus accurate sampling and follow-up are essential.

1. Introduction

Enlarged mediastinal lymph nodes can result from a number of potentially serious aetiologies including tuberculosis (TB), carcinoma, lymphoma, sarcoidosis or can be benign. Investigation traditionally involved mediastinoscopy but this has been mainly superseded by endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). This procedure is less invasive and can sample an increased range of lymph nodes [1]. EBUS-TBNA has been demonstrated to be a valuable diagnostic tool in lung cancer [2], sarcoidosis [3] and tuberculosis [4].

The accumulation of a black, carbon-containing pigment, within the airways or lungs of those exposed to coal dust, biomass smoke or air pollution is well recognized [5,6]. Anthracosis has also been described in mediastinal nodes mimicking TB [7] and malignancy [8,9]. Invasive thoracoscopy or mediastinoscopy was required to elucidate anthracosis as the final diagnosis in these cases [7,9]. Anthracosis has also been identified by transoesophageal endosonography with fine needle aspiration in a case of anthracosis presenting on F-18-fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) with hypermetabolic mediastinal lymphadenopathy mimicking malignancy [8]. With increasing use of EBUS-TBNA in the investigation of mediastinal lymphadenopathy, anthracosis may be identified more frequently.

2. Methods

The cases described in this report are from a regional EBUS centre in North West London. This centre receives referrals from outlying hospitals to perform both diagnostic and staging EBUS examinations.

This was a retrospective case series driven by the clinical observation that there appeared to be cases of PET avid lymph nodes that were eventually proven to only have anthracotic

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Abbreviations list

CT	computed tomography
EBUS-TBNA	endobronchial ultrasound-guided transbronchial needle aspiration
FDG PET/CT	F-18-fluorodeoxyglucose positron emission tomography/computed tomography
PCR	polymerase chain reaction
SUV	standardised uptake value
TB	tuberculosis
VATS	video assisted thoracoscopic surgery

changes. An audit of the case load from January to June 2012 identified cases where no other diagnosis was finally made apart from anthracotic change within lymph nodes.

The decision to utilise a PET scan prior to EBUS was made on standard clinical grounds by the requesting respiratory physician as the initial presumptive diagnosis would have been that of probable malignancy. PET is used as a staging tool and to guide the requirement for further sampling. Similarly EBUS-TBNA is used in this region as the initial sampling modality for suitable lymph node stations and would have been requested at the discretion of the local referring multi-disciplinary teams.

Mycobacterial cultures were routinely sent in all cases given the presence of mediastinal lymphadenopathy. Other bacterial or fungal cultures were only sent if there were coincidental parenchymal abnormalities; in this series this was irrelevant in all but Case 2.

Having identified cases where the rapid cytological evaluation defined only anthracosis, the clinician involved took a more detailed exposure history directly from the patient with a particular focus on whether biomass fuel exposure was a factor.

3. Case reports

3.1. Case 1

A 67-year old Afghani woman was referred after an incidental finding of right hilar and paratracheal lymphadenopathy during investigations for left-sided chest pain. She reported breathlessness on climbing stairs. Past medical history included type 2 diabetes mellitus, hypertension and TB fully treated in Afghanistan 35 years previously. She was a lifelong non-smoker. Examination was unremarkable.

A T-Spot test was positive, consistent with her previous TB, but TBNA samples were auramine, culture and polymerase chain reaction (PCR) negative for TB. A computed tomography (CT) scan performed during inpatient investigations identified a left rib fracture in addition to incidental right-sided hilar and paratracheal lymphadenopathy. An FDG-PET scan demonstrated increased metabolic activity in the right paratracheal node with a maximum standardised uptake value (SUV) of 8.4 (normal values <2.7) [10] (Fig. 1). On EBUS-TBNA of subcarinal, paratracheal and right hilar mediastinal lymph nodes, black pigment was obtained

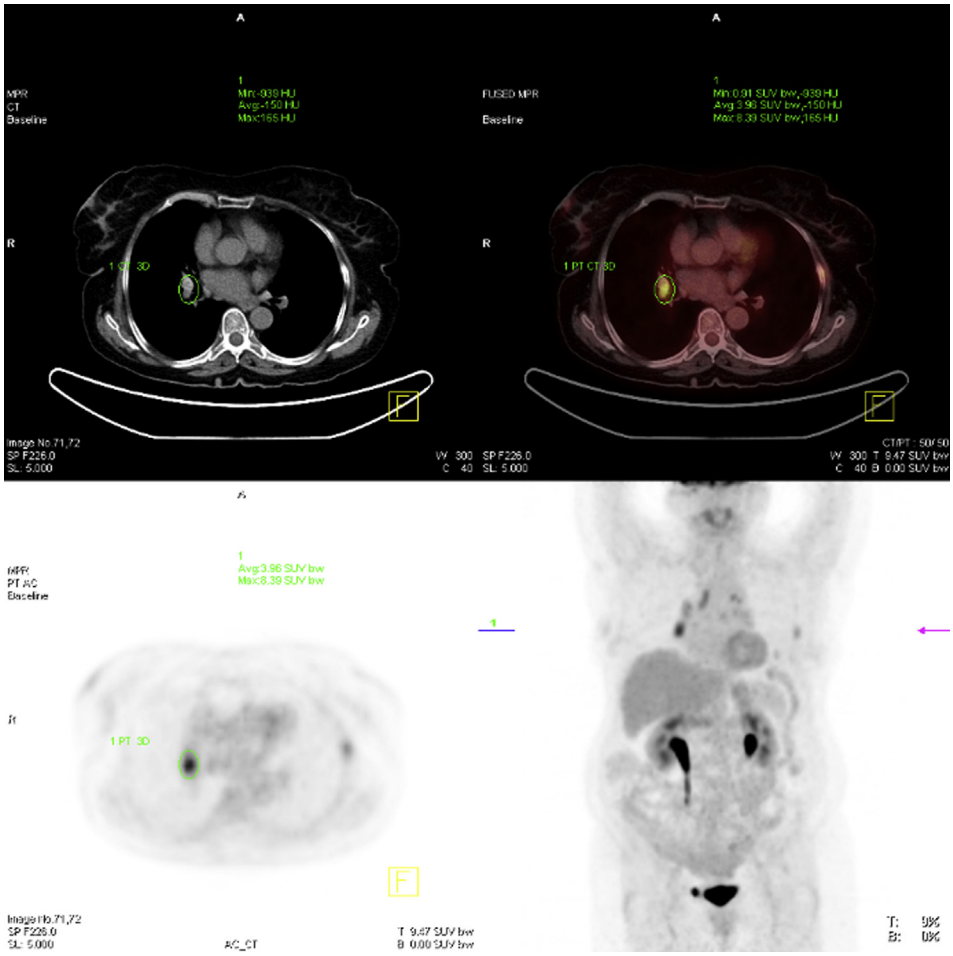

Fig. 1. A FDG PET/CT scan demonstrated high-grade metabolic activity in the right hilar soft tissue lesion, maximum SUV 8.4, measuring approximately 2.4 cm. There are metabolically active right hilar, paratracheal, and prevascular lymphadenopathy.