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Incidental findings and normal variants on hybrid imaging: azygous lobe and fissure

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ABSTRACT

Hybrid imaging, a modality which combines metabolic and anatomical information, has become a key component in the field of oncology. Variations of normal anatomy present on this type of imaging may be misinterpreted as pathology by nuclear physicians. The scans presented in this paper are part of a series which aims to identify and discuss incidental findings and normal variants of anatomy which may be apparent on hybrid imaging. This case of a 74-year-old woman with a history of malignancy highlights the presence and appearance of an azygous lobe and fissure on axial and sagittal images of a ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography scan. The azygous lobe is a rare normal variant of lung anatomy. Although it is not a pathological finding, it can have medical and surgical implications. Therefore, it is important that nuclear physicians are aware of this variant of lung anatomy in order to prevent misdiagnosis and mismanagement of the patient.

Keywords: Incidental findings, lung, positron emission tomography computed tomography, radionuclide imaging.

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The azygous lobe is a rare anatomical variant of the lung that is most commonly seen in the right upper lobe [1]. It was first described in 1777 by Doctor Heinrich August Wrisberg through his observations of cadaveric lungs [2]. This normal variant is present in about 0.4% of chest radiographs and 1.2% of high resolution CT scans [3]. The prevalence has been shown to be greater in men than in women [1]. This variant can be misdiagnosed as pathology on imaging and may have implications for surgeries and the surgical approach [1].

The azygous lobe forms due to failure of the right posterior cardinal vein to move medially during embryogenesis [4]. This vein is the precursor to the upper portion of the azygous vein, and it normally migrates to its usual position between the right upper lobe and the main stem bronchi [2]. In individuals with an azygous lobe, the lateral positioning of the azygous vein arch causes cleaving of the right lung apex during the growth phase of the lung in an embryo [4]. This results in the formation of the azygous fissure, or the mesoazygous [3]. The section of the lung which is separated from the rest of the lung by the azygous fissure is known as the azygous lobe [1].

On axial CT images the azygous fissure appears as a curvilinear line of varying thickness extending from the

lateral aspect of the vertebral body posteriorly to the right brachiocephalic vein and superior vena cava anteriorly [5]. The azygous fissure consists of four layers of pleura (two parietal layers and two visceral layers) and the azygous vein lies within the lower part of the azygous fissure [3,5].

The presence of an azygous lobe in a patient may be significant due to its clinical, radiological, and surgical implications. Anatomically, the bronchial and arterial supply of the azygous lobe arises from the apical and posterior segments of the right upper lobe [2]. Although the azygous lobe is usually asymptomatic, its positioning can bend bronchi, thereby predisposing individuals to respiratory pathology such as atelectasis and bronchiectasis [1,2]. Interns and surgical residents often lack awareness about this normal variant of the lung [1]. This can lead to misdiagnosis of the azygous lobe as an abscess, bulla or lung mass [3]. Furthermore, the presence of the azygous lobe may require the surgeon to modify their approach to surgical procedures. This is especially apparent in the case of segmental resections, lobectomies, or sympathectomies [1]. Therefore, it is important that nuclear physicians are aware of this normal anatomical variant of the lung in order to ensure accurate diagnosis, reporting and management of the patient.

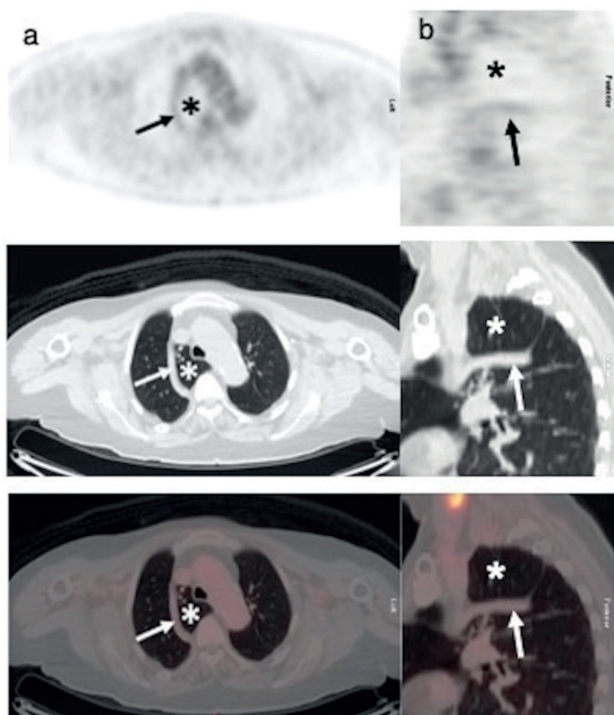


Figure 1. Axial (a) and sagittal (b) images of a ¹⁸F- fluorodeoxy-glucose positron emission tomography/computed tomography (CT) scan of a 74-year-old female with a history of multiple malignancies (breast cancer, thyroid cancer and non-Hodgkin's lymphoma) shows an azygous lobe (asterisk), bounded by an azygous fissure (solid arrow) in the right upper lung. Note minimal increased uptake along the course of the azygous fissure.

List of Abbreviations

CT Computed tomography

Conflict of interest

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Consent of patient

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