PET/CT used in the evaluation of pulmonary nodules suspicious for lung cancer in regions where infectious lung disease is endemic: to be or not to be?

Dear Editor,

The assessment of patients with suspected lung malignances[1–4] has routinely included morphological imaging evaluation, with either chest X-rays or chest computed tomography (CT). In addition—although not diagnostic in character—^{18}F-fluorodeoxyglucose positron emission tomography (FDG-PET), bone scintigraphy, and (occasionally) somatostatin receptor scintigraphy have been increasingly incorporated into daily practice in recent decades, providing physicians with useful and complementary information on the functional characteristics of lesions[5,6]. More recently, the emergence of combined PET/CT imaging has greatly aided the investigation of lung cancer by allowing even better delineation of areas with increased tracer uptake. This modality has helped radiologists avoid the technical difficulties that arose from the independent combination of PET and CT examinations, which resulted in substantial artifacts.

Many patients with early stage lung cancer will present with a solitary pulmonary nodule (SPN), defined as a single spherical or oval lesion that is less than 3 cm in diameter and is completely surrounded by pulmonary parenchyma without accompanying atelectasis or lymph node enlargement[5,6]. A very important step in investigating the etiology of an SPN is to determine whether it is benign or malignant in nature. In addition, PET/CT has been shown to be an accurate tool for the work-up of SPNs and for lung cancer staging, by improving the detection of metastatic disease, guiding therapy, and allowing clinical outcomes to be predicted[5–7]. However, there are a number of pitfalls to be considered during the assessment of SPNs with PET. In patients with inflammatory conditions or infections—such as bacterial or fungal infections; granulomatous diseases (tuberculosis, sarcoidosis, histoplasmosis, etc.); and pyogenic abscesses—there is a greater likelihood of higher metabolic activity due to increased granulocyte or macrophage activity, and such comorbidities have become a cause for great concern in some regions of Brazil[8–10].

In a recent study published in **Radiologia Brasileira**, Mosmann et al.[11] reviewed the evaluation of SPNs, in order to discuss the current role of FDG-PET (addressing its accuracy and cost-effectiveness) and to detail the current recommendations for the examination in this scenario. However, the authors did not focus on the applicability of FDG-PET in areas endemic for infectious granulomatous diseases. Deppen et al.[12] performed the most recent and biggest meta-analysis about the diagnostic accuracy of FDG-PET for pulmonary nodules suspicious for lung cancer, comparing the accuracy of the test in regions where infectious lung disease is endemic with that reported for regions where such disease is rare[8]. The pooled (unadjusted) sensitivity and specificity were 89% (95% CI: 86–91%) and 75% (95% CI: 71–79%), respectively. The adjusted specificity was 16% lower for regions where infectious lung disease is endemic than for those where it is not—61% (95% CI, 49–72%) versus 77% (95% CI, 73–80%). The specificity was also lower when the analysis was limited to rigorously conducted and well-controlled studies. The conclusion is that the data do not support the use of FDG-PET to diagnose lung cancer in areas where infectious lung disease is endemic unless an institution achieves test performance accuracy similar to that found in areas where it is not[12]. Because Mosmann et al.[11] did not include these data in their review, is important to highlight that fact.

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Neurological symptoms in a case of acute aortic dissection

Dear Editor,

A 52-year-old female with aortic dissection presented with neurological symptoms and signs, in a markedly acute presentation, of flaccid paraplegia and painful hypoesthesia of the lower limbs. She also presented postoperative monoplegia of the left arm. Computed tomography angiography of the chest confirmed the diagnosis of type A dissection (Stanford classification), with extension to the infrarenal abdominal aorta, associated with extensive subocclusive thrombus in the thoracoabdominal transition of the aorta (Figure 1A). On T2-weighted magnetic resonance imaging (MRI) sequences, hyperintensity was observed in the anterior horns of the spinal cord (Figures 1B and 1C), featuring an "owl eye" sign in axial images[1], together with enhancement after administration of paramagnetic contrast, as well as restricted

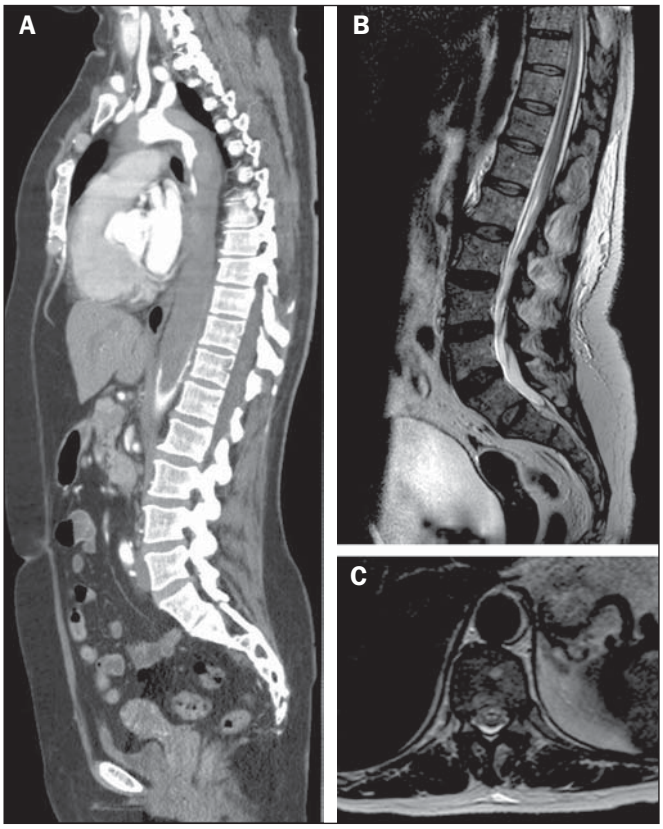

Figure 1. A: Maximum intensity projection reconstruction of computed tomography angiography in the sagittal plane showing an extensive mural thrombus in the thoracic aorta, extending to the infrarenal aorta. **B:** Sagittal T2-weighted MRI sequence showing areas of hyperintensity within the anterior spinal cord. **C:** Axial T2-weighted MRI at the level of the T10 spinal segment demonstrating anterior areas of hyperintensity, with the "owl eye" sign.

diffusion of water at the levels studied. Cranial MRI revealed acute lesions (also with restricted diffusion) in the right middle cerebral artery. The patient underwent surgery to treat the aortic dissection, and her neurological function was monitored.

The evaluation of the aorta by imaging methods has been the subject of a series of recent publications in the Brazilian radiology literature[2–4]. In the case presented here, neurological findings were associated with aortic dissection, and the MRI findings were consistent with the diagnosis of spinal cord infarction with ischemic stroke in the right middle cerebral artery. Although spinal cord infarction is not a rare event[5], the subtlety of the findings and the wide range of differential diagnoses can make its diagnosis difficult. Spinal cord ischemia can be attributed to several causes, including aortic dissection (as in the case presented) and thoracolumbar sympathectomy, or can even occur as a postpartum complication. The single anastomotic segment that irrigates the anterior two thirds of the spinal cord (mainly by the artery of Adamkiewicz) is more susceptible to ischemia than is the posterior segment, which has several levels of vascular supply[6]. A high degree of clinical suspicion of neurological involvement of the spinal cord is indicative of the diagnosis. Symptoms vary depending on the extent of the affected area and the level of spinal injury. Cerebral ischemic lesion is also a possible complication of aortic dissection and can result from reduced blood flow to the brain caused by the surgical procedure or even from carotid involvement caused by dissection or embolism from the thrombus in the aorta. In addition, data in the literature indicate that there is a right-side dominance of lesions, which is explained by different mechanical dynamics in the progression of the dissecting hematoma.

MRI is particularly sensitive in the detection of aortic dissection and can reveal signal abnormality in the anterior horns of the spinal cord, which can be associated with enhancement after contrast agent injection. The spinal segment most often affected is the thoracic segment, due to the border arterial supply[6]. Diffusion sequences can show restriction in the ischemic area. In fact, diffusion sequences can provide early detection[7], although this technique is not always applied in routine MRI scans of the spinal cord. Therefore, we have presented a case of aortic dissection with a rare combination of neurological complications of brain and spinal cord ischemia.

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Use of multislice computed tomography in the diagnosis of annular constrictive pericarditis

Dear Editor,

A 65-year-old man with a history of pleural tuberculosis was referred to our outpatient clinic due to respiratory difficulty. He presented with worsening dyspnea on minimal exertion. Examination confirmed that the patient was experiencing mild respiratory difficulty; his respiration rate was 25 breaths per minute, and his heart rate was 98 beats per minute. Cyanosis, jaundice, and signs of heart failure were absent, and other systems appeared normal. Multislice computed tomography showed a calcified pericardial band encircling the left ventricular cavity at the level of the atrioventricular groove (Figure 1).

Complete pericardiectomy was performed successfully and the postoperative course was uneventful. Histopathologic examination of the excised pericardium showed fibrocollagenous thickening with areas of hemorrhage and heavy calcific deposits. No areas of granuloma or vasculitis were identified. The final diagnosis was annular constrictive pericarditis.