Clinical impact of endoscopic ultrasound in the study of adrenal glands: cytomegalovirus infection mimicking a neoplastic hypercaptation in PET

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Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given their consent for their images and other clinical information to be reported in the journal. The patient understands that their name and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

CASE REPORT
We present the case of a 71-year-old female with stage IV follicular lymphoma in complete remission since 2006. In March 2019, chemotherapy treatment was started due to a relapse with pulmonary involvement. At three months, the patient presented a bad general condition and fever. A positron emission tomography (PET) showed abnormal metabolic activity in the left adrenal gland (AG), suggestive of lymphoma recurrence (Fig. 1). Tuberculosis and human immunodeficiency virus (HIV) infection were ruled out. Endoscopic ultrasonography-guided fine needle aspiration (EUS-FNA) was performed. A hypoechoic, heterogeneous nodular lesion, with well-defined margins with a maximum diameter of 27 x 16 mm of was reported (Fig. 2). Cytopathology confirmed isolated epithelial cells without cytological atypia, focus of adrenal adenoma and cytomegalic inclusions with positive immunohistochemical expression for cytomegalovirus (CMV) (Fig. 3). A clinical improvement was observed after treatment with ganciclovir.

**DISCUSSION**

The most frequent causes of solid unilateral lesions in AG in patients without HIV infection are benign lesions such as adenomas, primary malignancy tumors and metastases of lung neoplasia (1,2). AG infections secondary to CMV typically occur in HIV-infected patients and with bilateral involvement. The presence of an adenoma in the left AG could have caused a false-positive in the initial PET, but after ganciclovir treatment, no abnormal metabolic activity was detected in control PET. To our knowledge, this is the first case reported in the literature of unilateral CMV infection of an AG in a non-HIV infected patient that was diagnosed by EUS-FNA (1-3). Given that PET scan hypercaptation is not always diagnostic of malignancy, it is mandatory to obtain pathological samples, of which EUS-FNA has proven to be the best technique (3).

**REFERENCES**


Fig. 1. Computed tomography (CT) scan and positron emission tomography (PET). A. PET showing abnormal metabolic activity in the left adrenal gland (standard uptake value: 4.4). B. CT scan showing the left adrenal gland with a nodule located in a lateral wing conserving the "seagull shape" morphology.
Fig. 2. Endoscopic ultrasound images of the left adrenal gland. A. A hypoechoic, heterogeneous nodular lesion, with well-defined margins with a maximum diameter of 27 x 16 mm. B. Endoscopic ultrasound-guided fine-needle aspiration of the left adrenal gland.
Fig. 3. Cytopathology images. A. Hematoxylin and eosin staining showing isolated epithelial cells without cytological atypia and focus of adrenal adenoma. B. Immunohistochemistry showing cytomegalic inclusions with positive immunohistochemical expression for cytomegalovirus.