CLINICAL IMAGE

Post-transplant lymphoproliferative disorder after kidney transplantation with organ-specific disease

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Kidney transplantation (KTx) may contribute to complications related to immunosuppression, such as infections, malignancies, or post-transplant lymphoproliferative disorder (PTLD) that, particularly at early stages, causes specific clinical symptoms and has a poor prognosis.[1,2] Diffuse large B-cell lymphoma (DLBCL) is the most common form of aggressive lymphoma in adults (30%), and it has a short, dynamic course. In 50% of cases, it primarily affects lymph nodes, and only in 15% of cases bone marrow.

^{18}F-fluorodeoxyglucose positron emission tomography / computed tomography (^{18}F-FDG-PET/CT) allows for simultaneous registration of morphological and functional data, and is a current state-of-the-art diagnostic imaging procedure for staging, restaging, and evaluation of response to treatment in DLBCL.[3]

We present a case of a 64-year-old man, 5 years after KTx due to end-stage renal disease of unknown etiology, treated with triple immunosuppressive therapy regimen (prednisone, tacrolimus, azathioprine). Routine ultrasonography of the abdomen, which was the first diagnostic step in this asymptomatic patient, revealed numerous lesions of metastatic type in the liver and calcifications in the prostate. Elevated lactate dehydrogenase level (263 U/l, reference range [RR], 135–214 U/l), mild anemia, leuco-, and lymphopenia were observed. Replication of cytomegalovirus and Epstein–Barr virus was not detected. Liver magnetic resonance imaging (MRI) showed many focal lesions, hypointense in T1-weighed (FIGURE 1A) and hyperintense in T2-weighed (FIGURE 1B) images, with restricted diffusion, contrast enhancement, and central dissolution. Prostate gland MRI scan

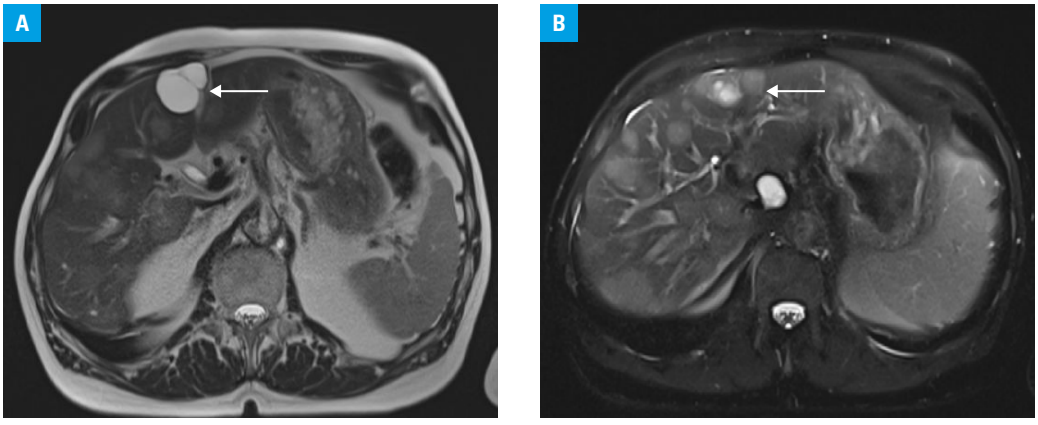

FIGURE 1 **A** – magnetic resonance (MR) T1-weighed image showing diffuse large B-cell lymphoma (DLBCL) and a hypointense focal lesion in the liver (arrow); **B** – MR T2-weighed image showing DLBCL and a hyperintense focal lesion in the liver (arrow)

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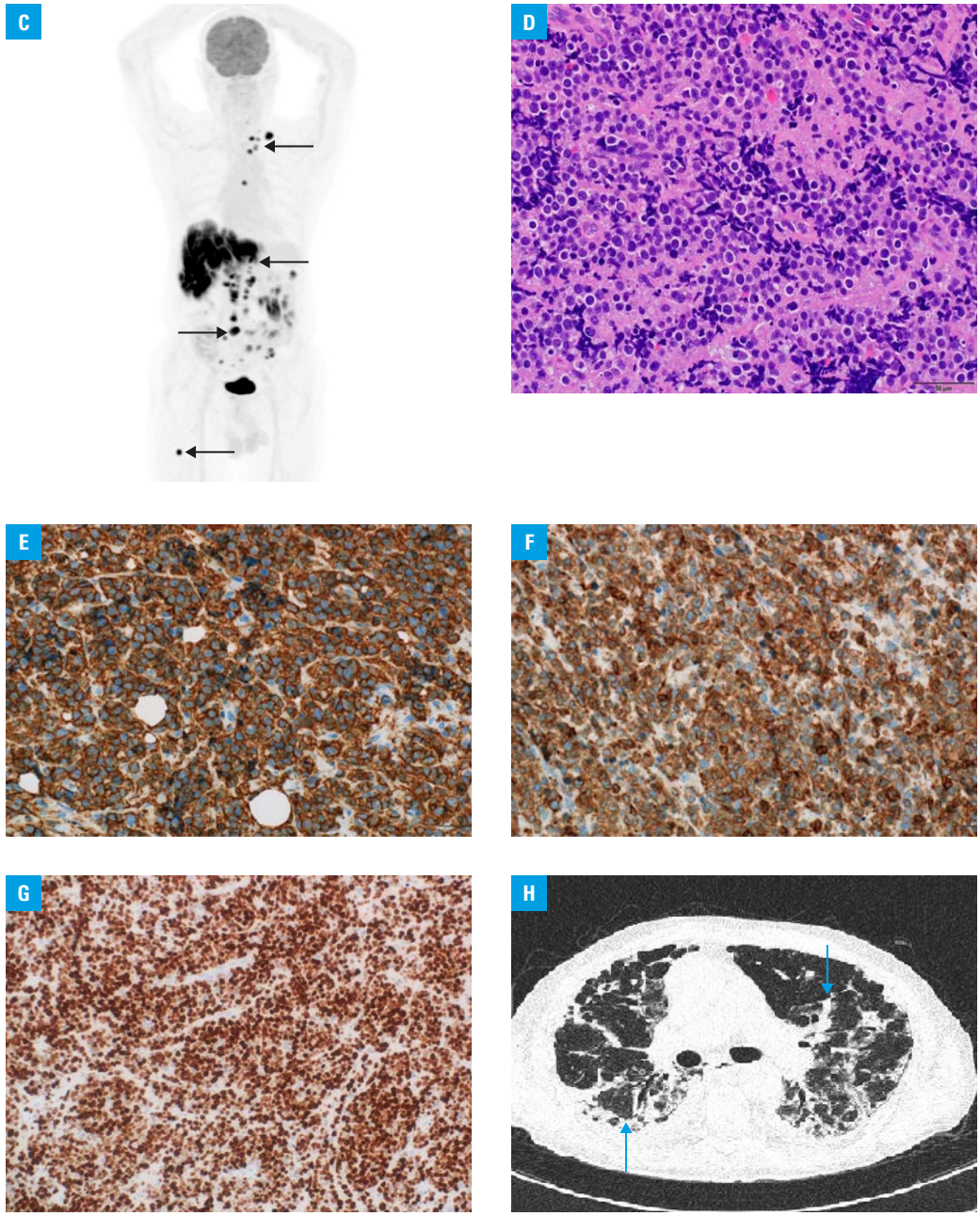

FIGURE 1 **C** – coronal ^{18}F-fluorodeoxyglucose positron emission tomography / computed tomography showing DLCBL and metabolic activity in the lymph nodes (on the left side of the neck, in the chest, periaortic area of the abdomen), liver, peritoneum, vertebrae, iliac bone, and femur (arrows); **D** – lymph node biopsy showing DLCBL and infiltration with atypical lymphoid cells (hematoxylin and eosin, original magnification × 100); **E–G** – lymph node biopsy showing DLBCL with neoplastic B-cells with positive reaction for CD20 (**E**) (immunohistochemistry, original magnification × 200), BCL-6 (**F**) (immunohistochemistry, original magnification × 200), and with a high proliferative index with almost all cells expressing Ki67 (**G**) (immunohistochemistry, original magnification × 50); **H** – computed tomography of the chest showing COVID-19 pneumonia with ground-glass opacities in the lungs (arrows)

showed a hypointense area in T2-weighed images with diffusion restriction. Biopsy of the prostate gland, gastroscopy, and colonoscopy did not reveal any neoplastic lesions. Chest CT revealed a single enlarged lymph node in the right hilum. ^{18}F-FDG-PET/CT showed metabolic activity in the lymph nodes (in the neck, chest, and abdomen), liver, peritoneum, vertebrae, iliac bone, and femur (FIGURE 1C). No evidence of lymphatic tissue proliferation was found on bone marrow biopsy. Left supraclavicular lymph node biopsy was performed. Histopathologic examination showed B-cell aggressive lymphoma, predominantly DLBCL (FIGURE 1D–1G). The patient received R-CHOP chemoimmunotherapy (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisone) and the immunosuppressive treatment was modified by adding everolimus. After the second cycle of chemotherapy, the patient developed COVID-19 pneumonia manifested by ground-glass opacities on the chest CT scan (FIGURE 1H). During hospitalization, the patient received remdesivir, steroids, antibiotics, heparin, and oxygen therapy. After the treatment, he was discharged home

in a good condition. Heart disease worsening and infectious complications led to chemotherapy conversion to R-CVP regimen (rituximab, cyclophosphamide, vincristine, and prednisone). Hematologic treatment resulted in remission of DLBCL. On control ^{18}F-FDG-PET/CT immediately after the end of treatment and after another 8 months, the presence of a metabolically active lymphoma process was not shown. Five years after diagnosis, the patient has stable KTx function (serum creatinine level, 235 μmol/l, RR, 44–80 μmol/l) with ongoing DLBCL remission.

This case is an interesting example of difficult diagnosis of neoplastic diseases developing in transplant recipients and usefulness of ^{18}F-FDG- PET/CT in the diagnostic process. Several studies showed usefulness of ^{18}F-FDG-PET/CT in detection of PTLD, malignancies, and infections in adult and pediatric patients after transplantation and in selection of the optimal biopsy site.[1,2,4] This case proves the importance of accurate cancer screening in patients after organ transplantation. Early detection followed by a quick start of appropriate treatment improves the outcome. In the case of PTLD, ^{18}F-FDG-PET/CT can help in quick diagnosis and treatment selection, and it should be the gold standard for assessing suspicious lesions in patients after KTx.

ARTICLE INFORMATION

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