^{64}Cu-DOTA-Rituximab PET/CT of B-Cell Non-Hodgkin Lymphoma for Imaging the CD20 Expression

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Abstract: ^{64}Cu-DOTA-rituximab PET/CT was performed on a 62-year-old and a 71-year-old men diagnosed with B-cell non-Hodgkin lymphoma. Compared with ^{18}F-FDG PET/CT, lesions could be detected more sensitively, and it was confirmed that there was no discernible ^{64}Cu-DOTA-rituximab uptake in the tumor other than lymphoma. ^{64}Cu-DOTA-rituximab PET/CT could be a powerful tool for the diagnosis and monitoring treatment response of lymphoma because of imaging the CD20 expression.

Key Words: ^{64}Cu-DOTA-rituximab, B-cell lymphoma, CD20 antigen, positron emission tomography

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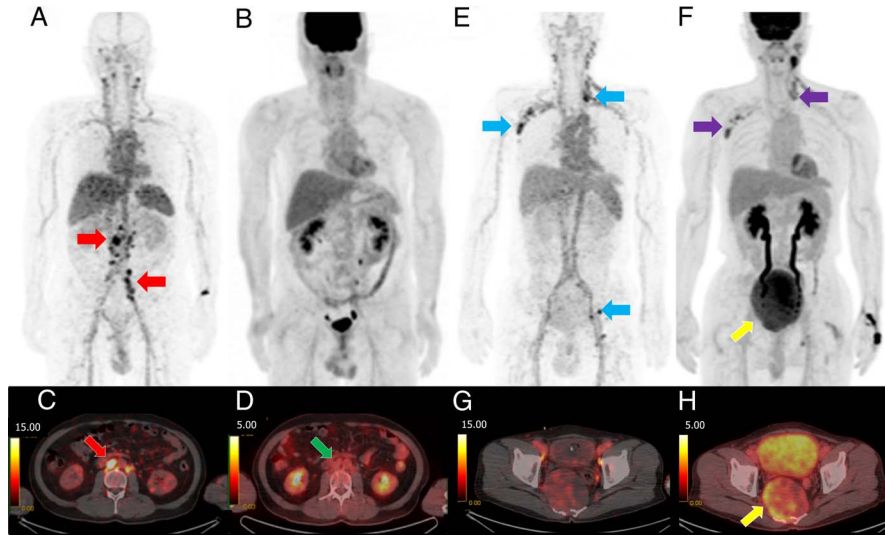

FIGURE 1. A 62-year-old man diagnosed with mantle cell lymphoma underwent ^{64}Cu-1,4,7,10-tetraazacyclododecane-1,4,7,10-tetraacetic acid (DOTA)-rituximab and ^{18}F-FDG PET/CT for restaging. The MIP images displayed the uptakes of ^{64}Cu-DOTA-rituximab of the multiple lymph nodes in the abdominopelvic region (**A**, red arrow), whereas there was no clear uptake of ^{18}F-FDG (**B**). In the axial PET/CT images, the intense uptakes of ^{64}Cu-DOTA-rituximab were observed (**C**, red arrow), but the abdominal lymph nodes did not show a discernible ^{18}F-FDG uptake (**D**, green arrow). A 71-year-old man was initially diagnosed with follicular lymphoma. On the MIP image, lymph nodes in the cervical, axillary, and inguinal regions showed intense uptake of ^{64}Cu-DOTA-rituximab (**E**, blue arrow), and ^{18}F-FDG showed similar uptake pattern but slightly lower uptake than that of ^{64}Cu-DOTA-rituximab (**F**, purple arrow). This patient was previously diagnosed with a large sacral chordoma with clear ^{18}F-FDG uptake (**H**, yellow arrow). However, the uptake of ^{64}Cu-DOTA-rituximab was not observed at the chordoma (**G**). Some researchers reported that most of lymphoma patients showed ^{18}F-FDG–avid lesions including the mantle cell lymphoma and follicular lymphoma.[1–3] However, we found out that in some cases it is not easy to delineate the lymphoma lesions using ^{18}F-FDG PET/CT[4,5] without ^{64}Cu-DOTA-rituximab PET/CT. ^{64}Cu-DOTA-rituximab PET/CT could be a powerful tool for the diagnosis and monitoring treatment response of lymphoma because of imaging the CD20 expression.[6,7] When planning radioimmunotherapy using an anti-CD20 monoclonal antibody, it can provide the information for the appropriate selection of subjects and for the proper therapeutic dose after dosimetric analysis.[8]