

Application of ⁶⁸Ga-DOTA-TATE PET/CT in metastatic neuroendocrine tumor of gastrointestinal origin

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A 65-year-old man underwent an abdominal ultrasound of acute abdominal pain, showing an incidental. Subsequently, a magnetic resonance imaging (MRI) scan of the abdomen revealed additional liver lesions, hyper-intense on T2-weighted images. Needle biopsy of the largest lesion showed a well-differentiated neuroendocrine tumor (NET) of gastrointestinal origin. The patient underwent a whole-body positron emission tomography-computed tomography (PET/CT) scan using ⁶⁸Ga-DOTATATE (somatostatin [SST]-analog) for accurate disease staging, which showed approximately 16 tracer-avid liver lesions. The hottest lesion (SUVmax: 52.4) was inferior to the medial segment of the left lobe (Fig. 1A: red arrow) corresponding to the largest lesion seen on MRI (Fig. 1B: arrow). A prominent tracer-avid lesion (SUVmax: 72.8) was seen in the terminal ileum/ileocecal junction (Fig. 1A: black arrow; Fig. 1C, D: white arrows) strongly suggesting the location of the primary tumor. In addition, two ⁶⁸Ga-DOTATATE-positive mesenteric lymph nodes were seen in the abdomen and left inferior pelvis (Fig. 1A: green arrows; SUVmax: 62.3 & 25.4, respectively) (Fig. 1D: yellow arrow). The patient underwent exploratory laparotomy with radio-guided (using a gamma probe post ⁶⁸Ga-DOTATATE injection) excision of the tumors from the small bowel, the mesenteric lymph nodes and the liver lesions. Subsequently pathological evaluation of

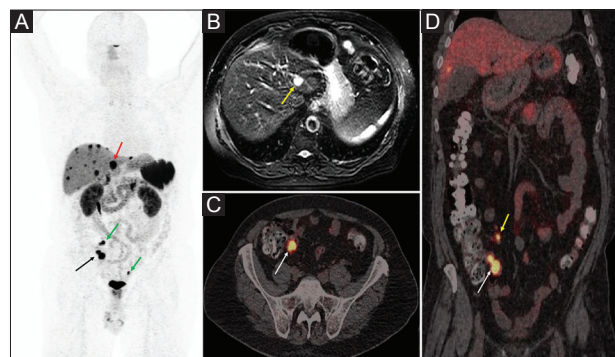


Figure 1 (A) Whole-body maximum intensity projection (MIP) B ⁶⁸Ga-DOTATATE positron emission tomography (PET) image. (B) Axial T2-weighted magnetic resonance image of the upper abdomen. (C) Axial fused ⁶⁸Ga-DOTATATE PET/CT image of the pelvis. (D) Coronal-fused ⁶⁸Ga-DOTATATE PET/CT image of the abdomen and pelvis

all excised specimens revealed primary grade-I NET in the terminal ileum with metastases to the liver and mesenteric lymph nodes.

Since the majority of NETs overexpress SST receptors, they can be effectively targeted and localized using radiolabeled SST analogs [1,2]. In the presented case ⁶⁸Ga-DOTATATE PET/CT accurately showed the extent of the disease and confidently revealed the location of the primary tumor, demonstrating the utility of PET/CT using ⁶⁸Ga-DOTA-conjugated peptides in the accurate management of patients with gastro-enteropancreatic NETs [3].

References

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Conflict of Interest: None

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