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Evaluation of Small Bowel Neuroendocrine Tumor Metastases by 68Ga-DOTATATE PET/CT: A Single Institution Review

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BACKGROUND: Gastrointestinal neuroendocrine tumors (GI-NETs) are malignancies with varied pathologic and clinical behaviors [1]. Most GI-NETs involve the small intestine (38%) and approximately 50% of patients demonstrate regional or distant metastatic disease at the time of diagnosis [2]. Increased incidence in recent years has mainly been attributed to physician awareness alongside advancements in endoscopy and radiologic imaging. One such imaging advancement is 68Ga-DOTATATE PET/CT, which provides greater sensitivity of tumor detection compared to CT and MRI, thus impacting clinical management [3-5]. The purpose of this study was to review the prevalence and pattern of small bowel NET metastases identified on 68Ga-DOTATATE PET/CTs performed at our institution.

METHODS: A retrospective review of 68Ga-DOTATATE PET/CTs from November 2016 through December 2017 was performed. Two board certified nuclear radiologists independently reviewed the imaging, documenting the presence of metastases: liver, spleen, bone, peritoneum, lymph nodes (mesenteric, retroperitoneal, upper abdominal, iliac chain) and distant (beyond the abdominal cavity). The reviewers were blinded to other imaging modalities, and discrepancies after initial interpretation were revisited to establish agreement.

RESULTS: Seventy eight 68Ga-DOTATATE PET/CT exams evaluating small bowel NETs were included in this study, with 29.5% (N=23) performed for initial staging. Of initial staging exams, 52.2% (N=12) demonstrated metastatic disease and the
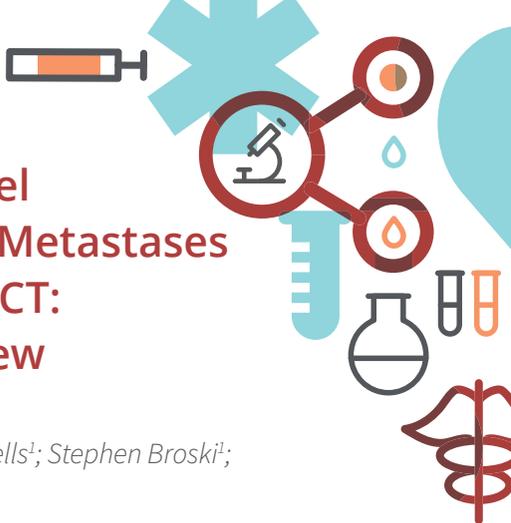
overall rate of metastatic disease, staging and re-staging) was 72%. Metastatic locations are shown in Table 1. Atypical metastases included cardiac (n=2) and breast (n=1). Table 1: Frequency of metastatic sites of small bowel NET on 68Ga-DOTATATE PET/CTs. (LN=lymph node) Metastasis N (%) Liver 41 (52.6) Spleen 2 (2.6) Bone 15 (19.2) Peritoneal 28 (35.9) LN: Mesenteric 46 (59.0) Retroperitoneal 26 (33.3) Upper abdominal 25 (32.1) Iliac Chain 20 (25.6) Distant 29 (37.2)

CONCLUSION: This study demonstrates a similar prevalence of liver (53%) and higher prevalence of bone (19%) metastases compared to current knowledge [6-7]. Additionally, the prevalence of peritoneal metastases (36%) was significantly higher than previously reported [8]. By reviewing the common and uncommon patterns of metastatic disease in GI-NETs, an informed radiologist can provide accurate staging and facilitate appropriate patient management.