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Preoperative Somatostatin Receptor-based Imaging Should be Routinely Performed in Neuroendocrine Tumors

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BACKGROUND

While contemporary gastroenteropancreatic neuroendocrine tumor (GEPNET) management guidelines recommend routine use of functional imaging preoperatively, there are little data highlighting trends in functional imaging adoption. This manuscript reviews 24 years of NET experience to identify changes in rates of preoperative functional imaging use, highlight performance differences between functional imaging types (somatostatin receptor positron emission tomography (SSTR PET) and Octreoscan) in small bowel (SBNET) and pancreas (PNET) NETs, and describe patters of preoperative metastatic spread in SBNETs and PNETs.

METHODS

A retrospective, single institution study was performed from 2000 to 2023 identifying patients with SBNETs and PNETs undergoing surgical resection and/or cytoreduction who underwent preoperative functional imaging. Primary endpoints were frequency of functional imaging use over time and location of metastases identified on preoperative imaging.

RESULTS

392 SBNET and 208 PNET patients had surgical treatment. 248 (63.3% of total) SBNET and 113 (54.3%) PNET patients received preoperative functional imaging. In SBNET patients, 158 had SSTR PET and 90 Octreoscans, and in PNET patients 47 had SSTR PET and 66 Octreoscans. While only 55.4% of patients with SBNETs or PNETs had functional imaging performed preoperatively between 2005 and 2009, the percentage increased to 73.5% between 2020 and 2023. There was a significant trend to increasing preoperative functional imaging use in SBNET patients (~2.5% per year, $p<0.01$), but not in PNETs

(p=0.82). 82.3% (204/248) of SBNET and 54.9% (62/113) of PNET patients had metastatic disease at presentation (p<0.01) with 28.2% and 17.7% presenting with extra-abdominal spread, respectively (p=0.03). SBNET patients had higher rates of metastases to the liver (72.6% vs 53.1%, p<0.01), peritoneum (13.3% vs 1.8%, p<0.01) and thoracic nodes (14.9% vs 4.4%, p<0.01) as compared to PNET patients. SSTR PET scans more frequently identified bone and retroperitoneal nodal metastases than Octreoscans in both SBNET and PNET patients. SSTR PET overtook Octreoscan as the preferred functional imaging modality in 2017-2018.

CONCLUSIONS

Preoperative functional imaging use increased significantly at our institution over the last 24 years in SBNET but not as much in PNET patients. Reasons for the lack of increase in PNETs may be due to higher incidence of false-positive results and reduced rates of distant metastases, although its use has increased over the last 2 years. Patients with SBNETs and PNETs frequently presented with metastatic disease and SSTR-based functional imaging was extremely helpful in identifying distant disease, for intra-operative planning, and making further management decisions.

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