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Accuracy of DOTATATE PET Imaging in the Preoperative Planning of Small Bowel Neuroendocrine Tumor Resection

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BACKGROUND

Small bowel neuroendocrine tumors (sbNETs) incidence is on the rise. Given that sbNETS are often multifocal with high risk of regional nodal metastasis, open resection with lymphadenectomy is the gold standard approach as it offers manual palpation of the entire small bowel. We evaluated the accuracy of preoperative DOTATATE PET/CT in estimating the number of lesions and the presence of nodal disease compared to postoperative pathology findings. We hypothesize that it may allow for the safe transition to total MIS approaches.

METHODS

A multicenter analysis was performed on patients with sbNETs who underwent preoperative DOTATATE PET imaging and surgery between 1/2016-8/2022. All patients underwent extracorporeal small bowel anastomoses. Preoperative imaging reports and blinded secondary imaging reviews were compared to the final postoperative pathology reports. Descriptive statistics were applied.

RESULTS

One-hundred and four patients met inclusion criteria. Pathology showed 53 (51%) patients had multifocal sbNETs and 96 (92%) had nodal metastases. The original preoperative DOTATATE PET imaging identified multifocal sbNET in 28 (27%) patients and LN metastases in 80 (77%) patients. Based on the original radiology reports, sensitivity for multifocal sbNET identification was 45%, specificity was 92%, positive predictive value (PPV) was 86%, and negative predictive value (NPV) was 62%. For identification of LN metastases, sensitivity was 82%, specificity was 88%, PPV was 99%, and NPV was 29%. The blinded re-review of DOTATATE PET imaging identified 48 (52%) patients with multifocal sbNETs and 82 (88%) with LN metastases. Sensitivity and specificity were 71%, PPV was 75%, and NPV was 67% for multifocal sbNET identification. Sensitivity was 92%, specificity was 87%, PPV was 96%, and NPV was 36% for LN metastases identification.

CONCLUSIONS

Although DOTATATE PET imaging is specific and relatively accurate, the sensitivity and NPV are insufficient to guide surgical planning. Preoperative use should not replace open palpation to identify additional synchronous lesions or to omit regional lymphadenectomy.

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