\textbf{18F-FDG PET/CT Imaging of Primary Gastric Lymphoma}

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\textbf{Abstract}

Primary gastric lymphoma (PGL) accounts for less than 4\% of gastric neoplasms. 18F-fluorodeoxyglucose positron emission tomography with simultaneously acquired computed tomography (18F-FDG PET/CT) allows for staging and differentiation from other gastric cancers. Rapid diagnosis and staging are important as chemotherapeutic response is generally favorable. We describe a case of an 83 year-old woman with Stage II1 PGL.

\textbf{Introduction}

18F-FDG PET/CT can be helpful to differentiate various gastric masses and is an important factor in the staging of PGL.

\textbf{Case Report}

An 83 year-old woman presented with fatigue, weight loss, upper abdominal pain made worse by eating, and a palpable mid epigastric mass. A CT scan noted wall thickening of the gastric pylorus and body, measuring up to 1.1 cm, and an enlarged 1.4 cm lymph node adjacent to the right gastroepiploic vessels. PET/CT obtained 70 minutes after the injection of 11.95 mCi of 18F-FDG demonstrated diffuse gastric wall hypermetabolism and avidity of the enlarged lymph node, SUV\text{\textsubscript{max}} of 25 and 15.3, respectively (Fig. 1). Upper endoscopy revealed a large ulcerated distal gastric body and antrum mass extending across the pylorus. Subsequent biopsy was consistent with diffuse large B cell lymphoma (DLBCL) and the patient was diagnosed with Stage II1 gastrointestinal lymphoma. A CT scan one month after chemotherapy showed improvement (Fig. 2).
Discussion

The stomach is the most common site for extranodal lymphoma, accounting for up to 50% of gastrointestinal lymphomas (1). PGL is most commonly either low-grade mucosa associated lymphoid tissue (MALT) lymphoma or diffuse large B-cell lymphoma (DLBCL) which vary in terms of histology, epidemiology, morbidity and treatment, yet appear similar on imaging.

\(^{18}\)F-FDG PET/CT is valuable in both detecting and staging PGL. The sensitivity of \(^{18}\)F-FDG PET/CT for detecting the DLCBL subtype of PGL is estimated to be 97%-100% (2). The high sensitivity is helpful as submucosal disease can be missed on endoscopy.

The Lugano staging system defines stage I as confined to the source organ, stage II as abdominal lymph node spread (local II\(_1\), distant II\(_2\) or adjacent organ involvement (IIE) and stage IV as disseminated extranodal disease or supra-diaphragmatic nodal involvement; no stage III is used. Given improved detection of unsuspected distant disease, particularly extra-nodal involvement, with \(^{18}\)F-FDG PET/CT over anatomic imaging alone, PET/CT has been shown to correctly up-stage in 22% and down-stage disease in 14% of cases (3). SUV\(_{\text{max}}\) has also been shown to correlate with aggressiveness with higher uptake associated with advanced Lugano stage (4).

CT findings of focal wall thickening and secondary gastric outlet obstruction suggest gastric adenocarcinoma over PGL. \(^{18}\)F-FDG PET/CT, however, can quantitatively differentiate wall thickening associated with PGL and non-lymphomatous cancers as there is generally a linear relationship between SUV\(_{\text{max}}\) and maximal gastric wall thickness in non-lymphomatous cancers, while PGL does not show a correlation between the two measurements (5). Our patient had maximal gastric wall thickness of 1.1 cm with a SUV\(_{\text{max}}\) of 25.0. Wu, et al, emphasizes this point showing that FDG metabolism was independent of wall thickness in PGL allowing for exceptionally avid gastric walls throughout a wide range of wall thickness, as is the case in our patient (5).

Conclusion

\(^{18}\)F-FDG PET/CT can be useful to differentiate PGL from other non-lymphomatous gastric cancers, and provides more accurate staging information.
Disclosure
The views expressed in the material are those of the authors and do not reflect the official policy or position of the U.S. Government, the Department of Defense, or the Department of the Air Force.

References
Figure 1. Marked diffuse gastric wall $^{18}$F-FDG uptake with an enlarged and avid adjacent lymph node.
Figure 2. One month follow-up CT shows significant improvement.