The Correlation of SUVmax and proliferation index in treatment naive Neuroendocrine tumors

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INTRODUCTION

This study explores whether the SUVmax of primary neuroendocrine tumors, measured by Ga-68 DOTATATE PET/CT, can serve as a predictor of tumor grade and proliferation activity. It focuses on treatment-naïve NETs to establish potential diagnostic correlations.

PURPOSE

To evaluate whether the maximum standardized uptake value (SUVmax) of the primary lesion, as measured by Ga-68 DOTATATE PET/CT imaging, can serve as a predictor of histological grade and Ki-67 proliferation index in treatment-naïve neuroendocrine tumors (NETs).

METHODS

•This retrospective study included 136 patients diagnosed with NET who underwent Ga-68 DOTATATE PET/CT between January 2024 and April 2025. Patient data were collected, including age, histopathology, primary tumor location, Ki-67 proliferation index, histological grade, and SUVmax values of the same tumor lesion.

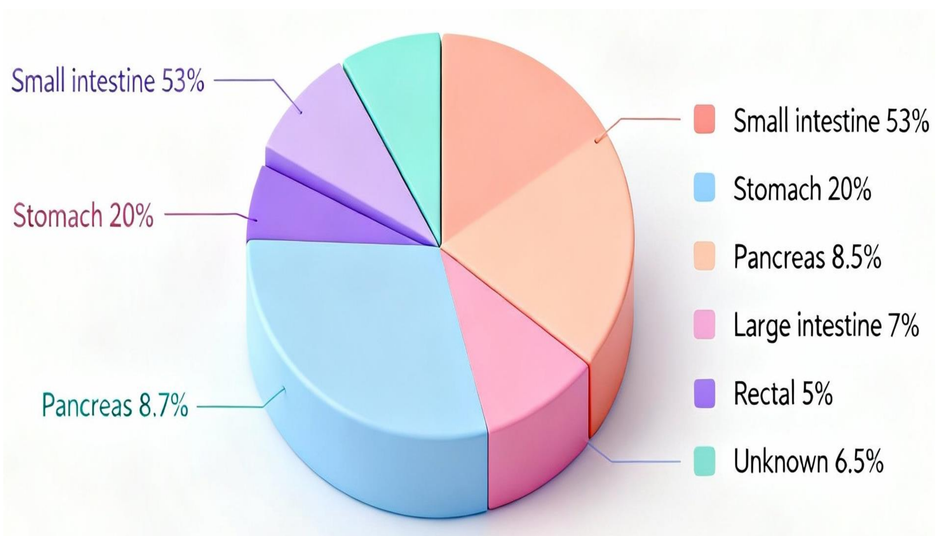
RESULTS

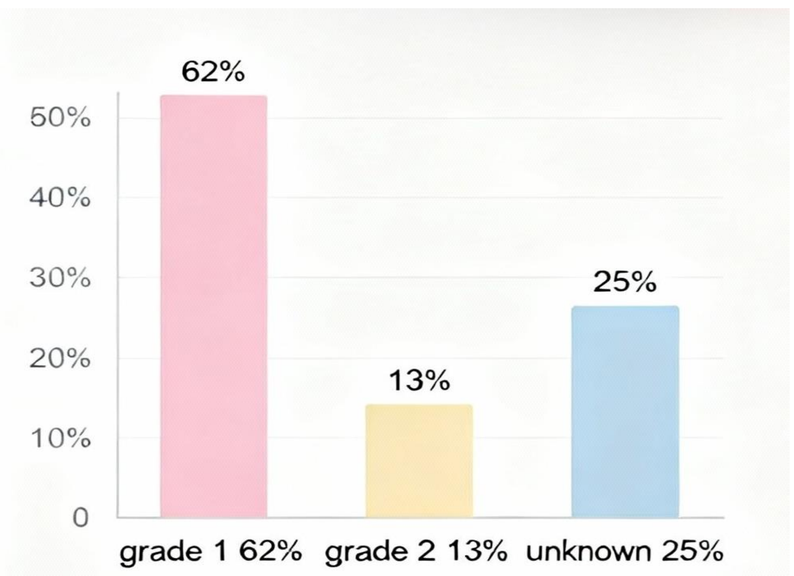
•The mean age was 47.5 ± 13.

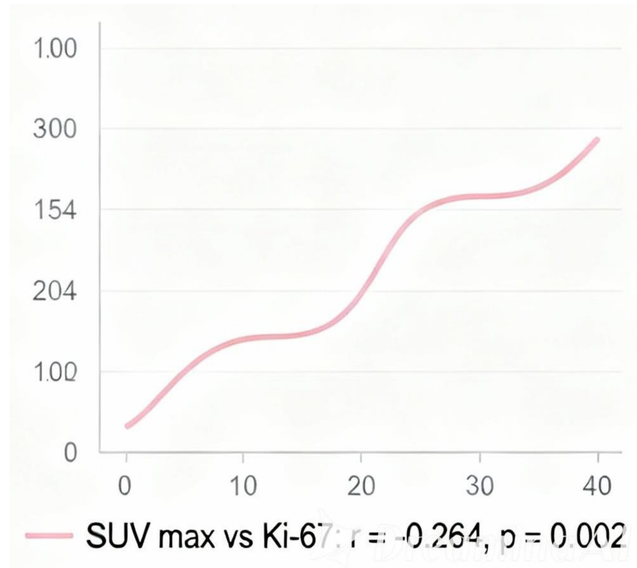
•The most common biopsy locations were the small intestine 53 % , stomach 20%, pancreas (8.5%), Large intestine 7% , Rectal 5% and 6.5% were unknown.

• Median Ki-67 proliferation index was 2(interquartile range: 4). Grade 1 tumours were present in 62 patients (62%), grade 2 tumors in 18 patients (13%) for the rest grade was not known.

•There was a weak but statistically significant negative correlation between SUV max and Ki-67 proliferation index (r = -0.264, p = 0.002), suggesting that higher Ki-67 levels were associated with slightly lower SUVmax values in this study.



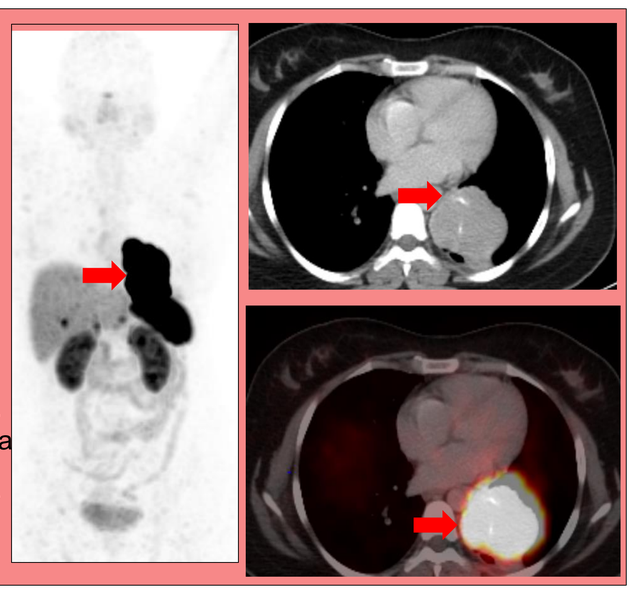




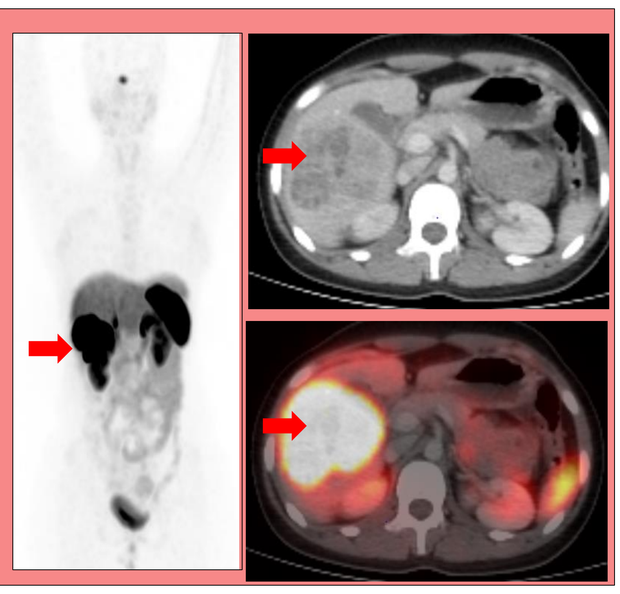
CASES

Lower Ki-67 Index with Higher SUVmax

Case 1: 31-year-old female presented with hemoptysis. Her DOTA PET/CT shows avid lesion in the endobronchial extension in the left lower lobe bronchus with resultant collapse. Histopathology Carcinoid tumor, grade 1. with Ki67 of <2%.

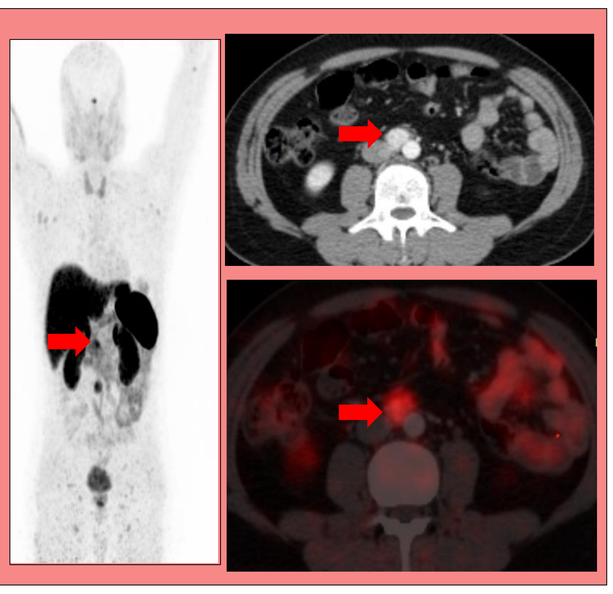


Case2:20-year-old female presented with Incidental Liver Lesion .Her DOTA PET/CT showed significantly avid large lobulated heterogeneously enhancing soft tissue mass in the right lobe of liver .Histopathology Neuroendocrine tumor, grade-1 with Ki67 of 1%.

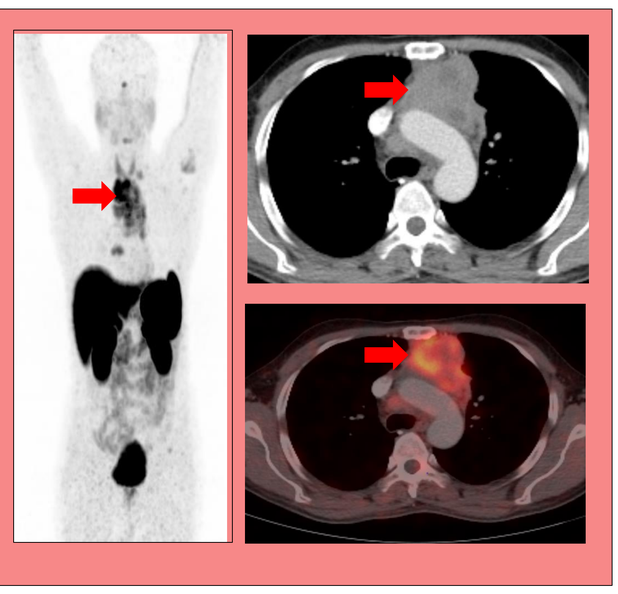


Higher Ki-67 Index with Lower SUVmax

Case 3: 38-year-old male presented with abdominal pain. His DOTA PET/CT shows avid lesion in the aortocaval recess near the lower pole of right kidney. Histopathology showed Paragan glioma. with Ki67 of 5%.



Case 4: 43-year-old woman's FDG 55-year-old-male with metastatic grade 2 Neuroendocrine tumor. His DOTA PET/CT shows avid heterogeneously enhancing mediastinal soft tissue density mass which is extending into the suprasternal recess.Histopathology Neuroendocrine tumor, grade 2 with Ki67 of 8%.



CONCLUSION

Initial Ga-68 DOTATATE PET/CT imaging in treatment-naïve NET patients revealed a significant inverse correlation between the SUVmax of the primary lesion and the Ki-67 proliferation index. This finding suggests that higher proliferative activity may be associated with lower somatostatin receptor expression, as reflected by decreased SUVmax, offering potential insight into tumor biology.

REFERENCES

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