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Research

Clinical Significance of Incidental Colorectal FDG-Avid Lesions on Oncologic 18F-FDG PET/CT: Colonoscopy and Pathology Correlation

İnsidental Kolorektal FDG-Avid Lezyonların Klinik Önemi: Onkolojik 18F-FDG PET/BT Bulgularının Kolonoskopi ve Patoloji ile Karşılaştırılması

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ABSTRACT

Objective: To evaluate the clinical significance of incidental focal colorectal fluorodeoxyglucose (FDG)-avid lesions detected on oncologic positron emission tomography/computed tomography (PET/CT) by correlating uptake intensity with colonoscopy and, when available, histopathology.

Methods: In this single-centre retrospective study, patients who underwent oncologic 18F-FDG PET/CT (October 2012-October 2025) and were referred for colonoscopy because of an incidental focal colorectal FDG-avid lesion were included if colonoscopy had been completed, forming a selected referral cohort (n=208). The lesion's maximum standardized uptake value (SUV_{max}) was recorded. Colonoscopy outcomes were classified as neoplastic lesion present (polyp or mass/tumour) versus no neoplastic lesion. Histopathology was available in 149 of 208 patients; pathology was grouped as cancer, high-grade dysplasia (HGD), or low-grade dysplasia or benign pathology, and advanced neoplasia was defined as cancer or HGD. Discrimination was assessed using receiver operating characteristic analysis for SUV_{max} alone and for simple covariate-adjusted models, with internal validation via stratified 5-fold cross-validation using out-of-fold predictions.

Results: The median age was 66 years; 59.6% were male. Colonoscopy identified neoplastic lesions in 133 of 208 patients (63.9%). In the histology subset (n=149), 44 cancers and 61 HGD lesions were found; advanced neoplasia was present in 105/149 (70.5%). SUV_{max} showed moderate discrimination for colonoscopy-defined neoplastic lesions [area under the curve (AUC): 0.724; 95% confidence interval (CI): 0.655-0.796], advanced neoplasia (AUC: 0.702; 95% CI: 0.605-0.785), and cancer (AUC: 0.729; 95% CI: 0.639-0.811). Covariate-adjusted models yielded only modest improvements for colonoscopy-based detection and no improvements for histology-verified endpoints.

Conclusion: Incidental focal colorectal FDG uptake prompting colonoscopy is frequently associated with clinically relevant findings. SUV_{max} provides moderate discrimination, whereas simple covariate-adjusted models add limited value for pathology-defined outcomes in this referred population.

Keywords: PET/CT, 18F-FDG, colon neoplasms, colon cancer, colonoscopy, colonic polyps

ÖZ

Amaç: Onkolojik pozitron emisyon tomografi/bilgisayarlı tomografide (PET/BT) insidental saptanan kolorektal florodeoksiglukoz (FDG)-avid lezyonların klinik önemini, tutulum şiddetini kolonoskopi ve mevcut olduğunda histopatoloji ile ilişkilendirerek değerlendirmek.

Gereç ve Yöntem: Ekim 2012-Ekim 2025 arasında onkolojik 18F-FDG PET/BT'de insidental kolorektal FDG-avid lezyon saptanıp kolonoskopi önerilen olgular arasından kolonoskopisi tamamlanan hastalar analize alındı; bu kriterlerle kolonoskopisi tamamlanmış seçilmiş bir sevk kohortu elde edildi (n=208). Lezyon maksimum standartlaştırılmış tutulum değeri (SUV_{maks}) kaydedildi. Kolonoskopi sonucu neoplastik lezyon var (polip/kitle) ve neoplastik lezyon yok (normal veya benign/enflamatuvar bulgular) olarak sınıflandırıldı. Histopatoloji mevcut hastalarda (n=149) patoloji; kanser, yüksek dereceli displazi (YDD) veya düşük dereceli/benign olarak gruplandı; ileri neoplazi kanser veya YDD olarak tanımlandı. Ayırıcı performans alıcı işletim karakteristiği eğrisi analizi ile değerlendirildi; iç doğrulama stratifiye 5-kat çapraz doğrulamada dış-kat tahminlere dayalı olarak yapıldı.

Bulgular: Medyan yaş 66 yıl olup hastaların %59,6'sı erkekti. Kolonoskopide 133/208 (%63,9) hastada neoplastik lezyon saptandı. Histopatolojisi olan 149 hastanın 44'ünde kanser, 61'inde YDD mevcuttu; ileri neoplazi 105/149 (%70,5) hastada görüldü. SUV_{maks}, kolonoskopi temelli neoplastik lezyon varlığını orta düzeyde ayırt etti [eğri altındaki alan (AUC): 0,724; %95 güven aralığı (GA): 0,655-0,796] ve ileri neoplazi (AUC: 0,702; %95 GA: 0,605-0,785) ile kanser (AUC: 0,729; %95 GA: 0,639-0,811) için de benzer performans gösterdi. Çok değişkenli modeller kolonoskopi temelli uç noktada sınırlı kazanım sağladı ve histoloji doğrulamalı uç noktalarda performansı artırmadı.

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ÖZ

Sonuç: PET/BT'de insidental saptanan ve kolonoskopi önerilen kolorektal FDG-avid lezyonlar, klinik açıdan sıklıkla anlamlı bulgularla ilişkiliydi. SUV_{maks} orta düzeyde ayırıcı performans sağlarken, bu popülasyonda patoloji temelli uç noktalarda basit çok değişkenli modellerin ek katkısı sınırlı görünmektedir.

Anahtar Kelimeler: PET/BT, 18F-FDG, kolon neoplazm, kolon kanseri, kolonoskopi, kolon polipleri

INTRODUCTION

18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) is widely employed for staging, restaging, and assessing treatment responses in numerous malignancies. Incidental gastrointestinal findings, particularly unexpected focal or discrete FDG-avid colorectal lesions, become more common as the volume of oncologic PET/CT examinations increases. Some of these lesions represent clinically important neoplasia. Nevertheless, interpretation is often challenging because physiological bowel activity, benign polyps, diverticular disease, metformin use, and inflammatory conditions can also cause increased FDG uptake. This can lead to a potentially avoidable colonoscopy or, conversely, a delayed diagnosis if an abnormality is dismissed as nonspecific uptake (1,2).

Several single-centre series have shown that an incidental colorectal FDG-avid lesion on PET/CT carries a meaningful probability of clinically relevant pathology, including advanced adenoma and colorectal cancer, when correlated with colonoscopy and histopathology (2-6). At the same time, reported rates of malignancy and advanced neoplasia vary considerably across studies. This heterogeneity likely reflects differences in underlying patient populations; imaging and inclusion criteria such as focal versus segmental uptake and the extent of CT correlation; and verification strategies that depend on completion of colonoscopy and histology (7-12).

A practical clinical question is whether PET-derived quantitative metrics, particularly the maximum standardized uptake value (SUV_{max}), can help triage patients referred for colonoscopy after incidental focal colorectal FDG uptake on PET/CT. Prior work suggests that higher SUV_{max} values are more often associated with neoplastic pathology, but proposed thresholds and their clinical utility remain inconsistent across cohorts. In many settings, SUV_{max} alone may be insufficient for reliable discrimination (13-18). For this reason, multimodal approaches that incorporate CT correlations, including localised wall thickening and contrast-enhanced CT findings, have been evaluated to improve diagnostic confidence and reduce false-positive interpretations (1,3,17,19). In addition, dual-time-point and bowel-preparation PET/CT strategies, such as water-enema PET/CT, have been investigated; however, these methods may not be feasible in routine workflows and have not fully addressed the central triage problem in real-world practice (20,21).

Outcome definition is another important driver of variability. Clinically, it is not enough to report "any colonoscopic lesion." Separating histologically verified advanced neoplasia, such as high-grade dysplasia (HGD) and carcinoma, from invasive cancer has direct implications for prioritisation and patient counselling. Evidence from primary studies, systematic reviews, and meta-analyses indicates ongoing uncertainty about which endpoints should be emphasised and how to handle incomplete histologic verification when colonoscopy is normal or when biopsy or resection is not performed (8-10,22). These considerations support the need for transparent reporting and clinically interpretable analyses in diagnostic accuracy and prediction model studies (23,24).

In this context, we conducted a retrospective observational study to evaluate the clinical significance of incidental colorectal FDG-avid lesions detected on oncologic 18F-FDG PET/CT, correlating PET/CT findings with colonoscopy and, when available, histopathology. Our aims were to describe colonoscopy and pathology outcomes in a consecutive cohort undergoing colonoscopy after a PET/CT recommendation and to quantify the discriminative performance of SUV_{max}, both alone and as part of internally validated multivariable models, for clinically relevant endpoints. These endpoints included colonoscopy-detected lesions (polyp or mass/tumour), histologically verified HGD, and cancer. Reporting was guided by established recommendations for diagnostic accuracy studies and multivariable prediction models (23,24).

METHODS

Study Design and Setting

This retrospective observational study evaluated the clinical significance of incidental colorectal FDG-avid lesions detected on PET/CT by correlating PET/CT findings with colonoscopy and histopathology.

Study Period and Case Identification

Between October 2012 and October 2025, a total of 40,111 PET/CT examinations were reviewed. Among these, 1,151 examination reports included a recommendation for

colonoscopy. The final study cohort comprised 208 patients with completed colonoscopy results (Supplementary Figure S1).

Inclusion and Exclusion Criteria

Inclusion criteria were: an incidental colorectal FDG-avid focal or discrete lesion reported on PET/CT that prompted a colonoscopy recommendation, and a completed colonoscopy report available for review, thereby defining a referral cohort with completed colonoscopy.

Diffuse or segmental colorectal FDG uptake was excluded; the analysis was restricted to focal, discrete FDG-avid colorectal lesions that triggered a colonoscopy recommendation. Patients were excluded if a colonoscopy was not performed or if the report was missing or incomplete.

Reference Standards and Endpoint Definitions

Colonoscopy findings were categorised into five mutually exclusive classes: normal, polyp, mass/tumour, inflammatory/ulcerative, and diverticular disease. A polyp was defined as any mucosal polypoid lesion detected at colonoscopy and reported by the endoscopist, regardless of histology or size.

Lesion location was recorded from colonoscopy reports and categorised as the right colon (caecum to transverse colon), the left colon (splenic flexure to sigmoid colon), or the rectum.

The primary endpoint was the presence of lesions detected by colonoscopy, defined as polyp or mass/tumour versus normal. Inflammatory, ulcerative, and diverticular findings were not considered lesions in the definition of the primary endpoint. This classification was pre-specified because inflammatory or ulcerative changes and diverticular disease represent non-neoplastic conditions and do not constitute neoplastic lesions on colonoscopy in the absence of polypoid lesions or masses/tumours.

Histopathology was available only when tissue sampling was performed; therefore, histopathology was typically absent when colonoscopy showed no abnormalities. This introduces partial verification (work-up) bias for pathology-defined endpoints. Accordingly, pathology-defined endpoints (advanced neoplasia and cancer) were analysed primarily in the histology-verified subset. As a complementary sensitivity analysis, we also performed a full-cohort analysis classifying cases without histology as non-advanced neoplasia, reflecting the clinical scenario in which a normal colonoscopy generally does not require biopsy. Accordingly, this full-cohort classification should be interpreted strictly as a sensitivity analysis under a strong assumption, and may underestimate advanced neoplasia if any lesions were present but not sampled.

Histopathology was available for a subset of patients (n=149). Histology results were grouped into cancer (1), HGD (2), and low-grade/benign (3). Advanced neoplasia was defined as cancer or HGD.

For advanced neoplasia, two analyses were performed: (i) a verified analysis restricted to patients with available histology and (ii) a full-cohort sensitivity analysis in which missing histology was treated as non-advanced neoplasia under a strong assumption.

The cancer versus non-cancer distinction was evaluated as a secondary, histology-defined endpoint within the subset with available histology.

Image Acquisition and Quantitative Assessment

Patients underwent whole-body 18F-FDG PET/CT imaging after fasting for at least 6 hours. Imaging was performed 50-70 minutes after intravenous administration of 3.7 MBq/kg 18F-FDG, provided that blood glucose was <200 mg/dL. Scans were acquired supine on an integrated PET/CT system (Philips Gemini TF 64; Philips Medical Systems, The Netherlands). A low-dose CT was acquired for attenuation correction and anatomic localisation prior to three-dimensional PET acquisition, which used standard attenuation correction. SUV_{max} was measured for a lesion showing incidental colorectal FDG uptake (Figure 1). SUV_{max} was defined as the highest voxel value within a volume of interest, delineated using the 40% SUV_{max} isocontour on attenuation-corrected PET images, and normalised to body weight.

Ethical approval was obtained from the İstanbul Medeniyet University, Göztepe Training and Research Hospital Clinical

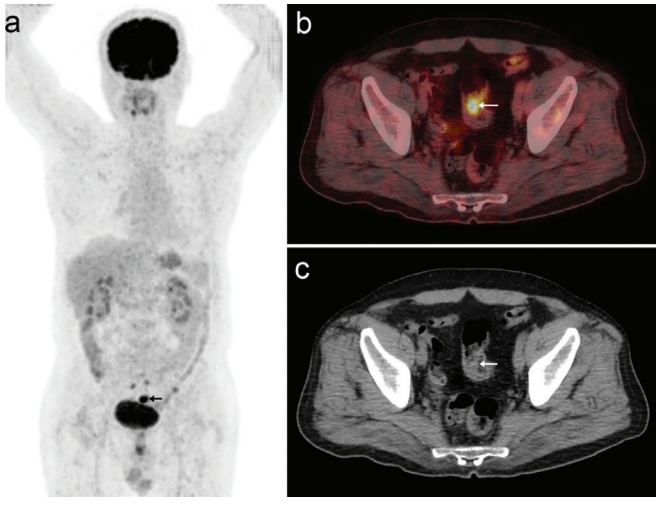

Figure 1. Representative example of incidental focal colorectal 18F-FDG uptake. Descriptions of Figure 1 are available in the Supplementary Material

18F-FDG: 18F-fluorodeoxyglucose

Research Ethics Committee (approval no: 2021/0595, date: 24.11.2021).

Statistical Analysis

Analyses were conducted in Python (Jupyter Notebook). Continuous variables are presented as median (IQR) and categorical variables as n (%). Diagnostic performance was assessed using receiver operating characteristic (ROC)/area under the curve (AUC) analysis, and secondary multivariable logistic regression models were evaluated with internal validation; full methodological details (bootstrap procedures, cut-off derivation, calibration assessment, and sensitivity analyses) are provided in the Supplementary Material.

RESULTS

Study Cohort

Between October 2012 and October 2025, 40,111 oncologic 18F-FDG PET/CT examinations were performed; of these, 1,151 examinations included a report recommending colonoscopy due to an incidental FDG-avid focal or discrete colorectal lesion. Of these, 208 patients who had completed colonoscopy and for whom a colonoscopy report was available were included in the analysis, forming a selected, colonoscopy-completed referral cohort.

The median age was 66.0 years (IQR: 58.0-74.0), and the median SUV_{max} was 9.1 (IQR: 6.7-13.1). In the cohort, 84 participants (40.4%) were female and 124 (59.6%) were male. Lesion location was classified as right colon in 56 (26.9%), transverse colon in 11 (5.3%), left colon in 96 (46.2%), and rectum/rectosigmoid in 45 (21.6%) (Supplementary Table S1). The median interval between PET/CT and colonoscopy was 23 days (IQR: 9-57 days).

On colonoscopy, findings were normal in 56 (26.9%), polyps in 88 (42.3%), masses/tumours in 45 (21.6%), inflammatory/ulcerative lesions in 13 (6.2%), and diverticular disease in 6 (2.9%) (Supplementary Table S1). Based on the prespecified definition, a neoplastic lesion on colonoscopy (lesion-any=1; polyp or mass/tumour) was identified in 133 (63.9%) patients, whereas lesion-any=0 indicated no neoplastic lesion on colonoscopy (normal, inflammatory/ulcerative, or diverticular findings), and these findings were classified as non-neoplastic for the colonoscopy-based endpoint.

Histopathology was available for 149 (71.6%) patients. Within this subgroup, histology showed cancer in 44 (29.5%), HGD in 61 (40.9%), and low-grade or benign pathology in 44 (29.5%). Advanced neoplasia (cancer or HGD) was present in 105 (70.5%) (Supplementary Table S1). Histology was unavailable primarily for cases with a normal colonoscopy because biopsies are not routinely obtained. Thus, missing pathology in the normal colonoscopy subgroup was largely structural and should not be interpreted as an independent negative verification.

Primary Endpoint: Neoplastic Lesion on Colonoscopy

SUV_{max} showed moderate discrimination for detecting a neoplastic lesion at colonoscopy (lesion-any) in the full cohort, with an AUC of 0.724 (95% CI: 0.655-0.796) (Figure 2a, Supplementary Table S2a). The Youden-optimal SUV_{max} cut-off was 8.7 (descriptive), yielding a sensitivity of 67.7% and a specificity of 70.7% (Supplementary Table S2), and should be interpreted as a descriptive, cohort-specific summary rather than a prescriptive clinical threshold. Prespecified thresholds are summarised in Supplementary Table S2.

Histology-Defined Advanced Neoplasia

In the histology-verified analysis (n=149), SUV_{max} discriminated advanced neoplasia with an AUC of 0.702 (95% CI: 0.605-0.785) (Figure 2b, Supplementary Table S2b). The Youden-optimal cut-off was 10.4 (Supplementary Table S3), but it should not be interpreted as a validated clinical decision threshold. In the full-cohort sensitivity analysis, under a strong assumption that missing histology indicates non-advanced neoplasia (n=208), discrimination was similar (AUC: 0.739; 95% CI: 0.667-0.807), with the same Youden-optimal cut-off (10.4) (Figure 2c, Supplementary Table S2c).

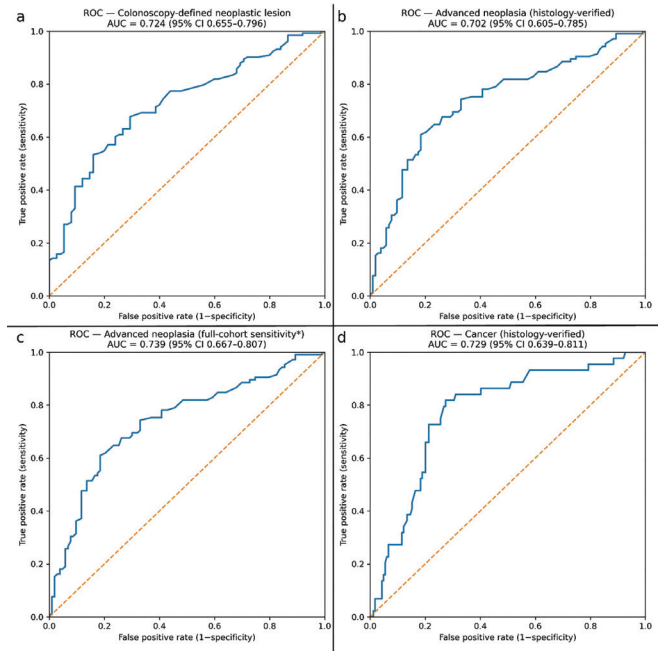

Figure 2. ROC curves of SUV_{max} for colonoscopy- and pathology-defined colorectal outcomes. Descriptions of Figure 2 are available in the Supplementary Material

ROC: Receiver operating characteristic, SUV_{max}: Maximum standardized uptake value, AUC: Area under the curve

Histology-Verified Cancer

Within the subgroup with available histology (n=149), SUV_{max} discriminated cancer from non-cancer histology with an AUC of 0.729 (95% CI: 0.639-0.811) (Figure 2d; Supplementary Table S2d). The Youden-optimal SUV_{max} cut-off was 10.5 (Supplementary Table S2d) but should not be interpreted as a validated clinical decision threshold.

Incremental Value of Simple Multivariable Models

Simple multivariable models provided internally validated discrimination estimates for the colonoscopy-based endpoint. For lesion-any, the multivariable model achieved an out-of-fold (OOF) AUC of 0.755 (95% CI: 0.687-0.821) (Supplementary Table S3). For histology-verified endpoints, the multivariable OOF AUC was 0.660 for advanced neoplasia (95% CI: 0.557-0.747) and 0.676 for cancer (95% CI: 0.577-0.767) (Supplementary Table S3). SUV_{max}-only ROC/AUC summaries are reported descriptively in Figure 2 and are not presented as directly comparable to cross-validated OOF AUCs from multivariable models.

Calibration of Multivariable Models (OOF)

Calibration summaries based on OOF predictions are presented in Figure 3 and Supplementary Table S3. For lesion-any, calibration was close to ideal (intercept 0.026; slope 0.939), indicating minimal systematic miscalibration (intercept near 0) and an appropriate dispersion of predicted risks (slope near 1). For histology-verified endpoints, calibration slopes were below 1, indicating that predictions were more extreme than the observed outcomes (advanced neoplasia: intercept 0.244, slope 0.712; cancer: intercept -0.339, slope 0.578), consistent with overfitting or overconfidence in the risk estimates. In addition, the positive intercept for advanced neoplasia suggests an overall underestimation of risk, whereas the negative intercept for cancer suggests an overall overestimation, as visualised in the calibration plots (Figure 3).

DISCUSSION

In this single-centre retrospective cohort study (October 2012-October 2025), incidental focal colorectal FDG-avid uptake on oncologic 18F-FDG PET/CT that prompted colonoscopy was associated with a high prevalence of clinically relevant findings: among 208 patients who completed colonoscopy, lesions were identified in nearly two-thirds of cases, and advanced neoplasia was common in the histology-verified subset (n=149). These findings support the practical message that such focal uptake should not be dismissed as physiological when it triggers endoscopic referral (2-6).

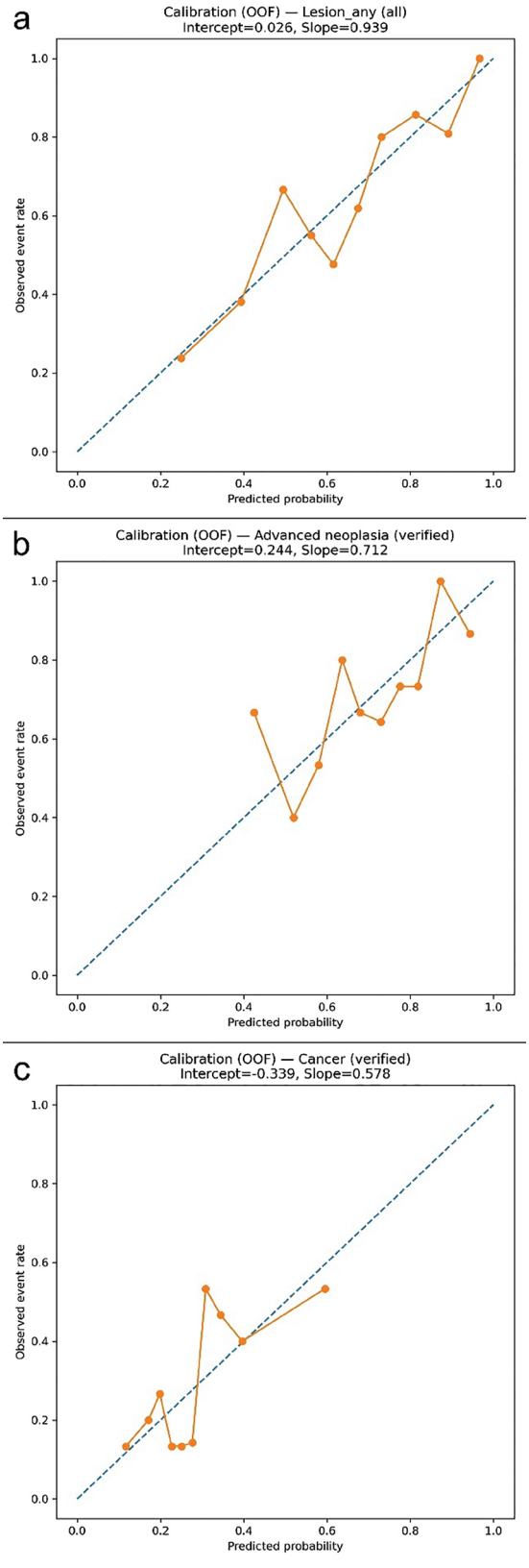

Figure 3. Calibration of multivariable models using out-of-fold (OOF) predictions. Descriptions of Figure 3 are available in the Supplementary Material

Principal Diagnostic Findings and Interpretation

Our discrimination analyses showed that SUV_{max} alone achieved moderate accuracy for detecting any colonoscopic lesion, and adding basic clinical/anatomic covariates provided only a small incremental gain for this broad endpoint. In contrast, for histology-verified endpoints (advanced neoplasia and cancer), SUV_{max} again demonstrated moderate discrimination, while multivariable models did not provide consistent improvement. This pattern suggests that in routine practice, SUV_{max} is a key quantitative signal for triage, whereas the incremental value of simple covariates (age, sex, coarse anatomic location) may be limited once colonoscopy referral has occurred. Similar heterogeneity in the incremental value of quantitative PET parameters and widely varying SUV_{max}-based thresholds have been reported across cohorts, likely reflecting differences in populations, referral criteria, and reference standards (13-18). Calibration was close to ideal for the colonoscopy-based endpoint (lesion-any), whereas histology-verified endpoints showed slopes <1, suggesting overfitting and indicating the need for external validation and, if required, recalibration before clinical use.

Several factors may explain why multivariable models provided little additional discrimination beyond SUV_{max} for histology-verified endpoints in our cohort. First, this pragmatic colonoscopy-completed referral cohort shapes the disease spectrum and may diminish the incremental value of simple clinical covariates while preserving the dominant effect of uptake intensity. Second, histology is outcome-dependent in routine practice: when colonoscopy is normal, tissue sampling is typically not indicated, and histopathology is therefore unavailable; accordingly, pathology-defined endpoints were analysed in the histology-verified subset, whereas "any colonoscopic lesion" was assessed across the full cohort. Finally, predictors that may add value elsewhere, particularly CT-based features (e.g., localized wall thickening or contrast-enhanced CT features), were not comprehensively captured in our dataset, thereby limiting gains beyond SUV_{max} (1,3,17,19).

Comparison with Prior Literature

Our findings are consistent with prior observational series and meta-analyses showing that incidental focal colorectal FDG uptake is associated with a meaningful prevalence of clinically significant lesions identified at colonoscopy and, when available, confirmed by histopathology, and therefore generally warrants endoscopic evaluation, although predictive values vary across settings and inclusion criteria (2-6,8-10,22). This variability cautions against using a single SUV_{max} threshold as a universal "rule-out" criterion. Consistent with this, our Youden-derived cut-offs should be viewed as cohort-specific statistical summaries rather than clinically generalisable decision thresholds. Studies that specifically addressed whether SUV_{max} can guide colonoscopy timing have reached mixed conclusions; some report a higher risk associated with greater SUV_{max} values, but the studies have not converged on a single, widely accepted cut-off (13-18). This supports a pragmatic approach in which SUV_{max} is interpreted alongside the qualitative uptake pattern and the available CT correlation, rather than being used in isolation (1,3,17,19). However, discrimination metrics such as AUC do not directly translate into clinical utility. In practice, the usefulness of SUV_{max}-based triage depends on the chosen referral threshold and the relative consequences of missed neoplasia versus unnecessary colonoscopies; therefore, thresholds should be selected within a decision-analytic framework and externally validated rather than inferred solely from the AUC.

Recent real-world data from Türkiye also indicate that incidental colorectal FDG uptake on PET/CT is often clinically relevant. In that cohort, incidental uptake was associated with endoscopic and pathologic abnormalities, and SUV_{max} was reported as a useful quantitative marker to support risk assessment (25). Taken together with prior literature, these findings reinforce the need for careful reporting and appropriate endoscopic work-up of incidental FDG-avid colorectal lesions detected on oncologic PET/CT (2-6,8-10,22,25).

From a clinical workflow perspective, our results support recommending colonoscopy for incidental focal colorectal FDG-avid uptake and reinforce that a substantial fraction of referred patients harbour clinically meaningful pathology. However, in this previously referred population, simple covariate-adjusted models did not demonstrate reliable added value over SUV_{max} for predicting advanced neoplasia or cancer. SUV_{max} may therefore serve as a supportive quantitative triage signal, but should not be used to downgrade the indication for colonoscopy when uptake is suspicious. In real-world oncologic settings, where competing risks and treatment timelines influence endoscopic workup, proposed refinements based on lesion location or referral context remain inconsistent and should therefore be applied cautiously (26-29). Our findings highlight that richer imaging correlations may be required to develop more robust triage tools beyond SUV_{max}.

Strengths

The strengths of this study include a clinically grounded cohort derived from routine PET/CT reporting and a clear endoscopic reference standard in all included patients,

with histopathology available for the majority. We also evaluated clinically relevant endpoints at different levels of stringency, including "any lesion on colonoscopy," histology-verified advanced neoplasia, and cancer, and reported discrimination using internal validation methods consistent with current reporting expectations (23,24).

Study Limitations

Several limitations merit emphasis. The retrospective single-centre design limits generalisability. Our cohort is enriched by design because it includes only patients for whom colonoscopy was recommended and completed. Therefore, our findings should be interpreted as performance estimates within a selected referral pathway rather than as prevalence estimates for all PET/CT patients. Histology was not uniformly available because tissue sampling occurs only when a biopsy or polypectomy is performed, which may introduce partial verification (work-up) bias for pathology-defined endpoints. Accordingly, we prioritised analyses of the histology-verified subset for advanced neoplasia and cancer, and we presented the classification of missing histology in the full cohort as non-advanced neoplasia, strictly as a sensitivity analysis under a strong, clinically motivated assumption. In addition, PET acquisition and reconstruction parameters, as well as uptake time variability, can influence SUV measurements. Although our institutional workflow follows a standard uptake time window, patient-level deviations were not explicitly modelled and may have introduced measurement noise (12). Finally, we did not incorporate more granular CT features, dual-time-point imaging, or dedicated bowel preparation protocols, all of which have shown promise in selected settings and could improve triage performance if available (20,21).

Future Directions

Future work should integrate imaging features beyond SUV_{max}, particularly CT correlates (e.g., focal wall thickening or morphologic abnormalities), and evaluate their added value for advanced neoplasia in externally validated, preferably multi-centre cohorts (1,17,19). Stratification by referral context and background malignancy status may help identify subgroups most likely to benefit from expedited colonoscopy, and harmonised endpoint definitions, with transparent handling of pathology-defined outcomes, will be essential for comparability across studies (23,24,27,29).

CONCLUSION

In a PET/CT-referred cohort undergoing colonoscopy, incidental colorectal FDG-avid lesions were frequently associated with clinically meaningful findings, including a high prevalence of advanced neoplasia among histology-verified cases. SUV_{max} provided moderate discrimination across endpoints, while simple multivariable models did not consistently add value for histologically verified advanced neoplasia or cancer. These results support prompt endoscopic evaluation of suspicious incidental colorectal FDG-avid lesions and suggest that improved triage tools will likely require incorporating richer imaging correlates beyond SUV_{max}.

ETHICS

Ethics Committee Approval: Ethical approval was obtained from the İstanbul Medeniyet University, Göztepe Training and Research Hospital Clinical Research Ethics Committee (approval no: 2021/0595, date: 24.11.2021).

Informed Consent: Retrospective study.

FOOTNOTES

Authorship Contributions

Concept: M.T.T., E.İ., Design: M.T.T., E.İ., Data Collection or Processing: M.T.T., E.İ., Analysis or Interpretation: M.T.T., E.İ., Literature Search: M.T.T., Writing: M.T.T.

Conflict of Interest: No conflict of interest was declared by the authors.

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Supplementary Material Links: https://d2v96fxpocvxx.cloudfront.net/68ab204c-182b-49da-b227-bc7efe058632/content-images/9db4d66b-4b8f-4358-a8b7-8d08220b423d.pdf

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