THE ADDED VALUE OF (18) F-FDG POSITRON EMISSION TOMOGRAPHY/ COMPUTED TOMOGRAPHY COMPARED TO CONTRAST ENHANCED COMPUTED TOMOGRAPHY IN THE DETECTION AND ASSESSMENT OF PERITONEAL DEPOSITS OF COLORECTAL ORIGIN

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ABSTRACT:

Background: *The challenge of diagnosing peritoneal carcinomatosis from colorectal cancer is notable in oncological imaging. This retrospective study aims to evaluate the effectiveness of contrast-enhanced Multi-Detector Computed Tomography (MDCT) versus Positron Emission Tomography-Computed Tomography using F18-fluorodeoxyglucose ((18F) FDG-PET/CT) in detecting peritoneal seeding.*

Aim of the Work: *Our study seeks to highlight the diagnostic superiority of positron emission tomography/computed tomography over contrast-enhanced computed tomography in detecting peritoneal deposits originating from colorectal cancer in patients already diagnosed with the disease.*

Patients and Methods: *We retrospectively evaluated 55 patients with colonic malignancy affecting any site from ileocecal valve till anus. They were reviewed for presence of the peritoneal deposits in FDG PET/CT and contrast enhanced CT. And the results were correlated to the tumor markers. The study was performed at the PET/CT unit in the radiology department of Ain shams university during the period between December / 2022 and October / 2023. Informed consent was obtained from all participants in the study.*

Results: *of 55 known patients diagnosed with colorectal cancer with suspected peritoneal affection. The tumor marker was positive in 52 patients, and negative in 3 patients associated with PET-CT sensitivity of 90.8%, Specificity of 66.67% and accuracy of 78.5% and CT sensitivity of 69.23%, Specificity of 33.33% and accuracy of 51.3 % of Contrast enhanced CT scan. And these findings underscore the considerable superiority of PET/CT compared to traditional imaging modalities (contrast CT scan) in diagnosing peritoneal carcinomatosis.*

Conclusion: *PET/CT outperforms contrast-enhanced CT in identifying peritoneal deposits, potentially reducing the need for laparotomies and enabling a more precise selection of patients suitable for adjuvant chemotherapy.*

Keywords: *Multi Detector Computed Tomography, positron emission tomography/computed tomography, peritoneal deposits, colorectal cancer.*

INTRODUCTION:

The peritoneum, omenta, and mesenteries are often sites for disease extension from nearby visceral organs and distant metastatic deposits. Despite imaging technology advancements and improved spatial resolution, accurately depicting peritoneal disease remains challenging. This

challenge is due to their complex anatomical configuration and extensive surface area, which may hide small or nodular tumor deposits [(1)].

The presence of peritoneal neoplastic dissemination significantly impacts tumor staging and is a crucial prognostic factor in many cancers. This influence is particularly notable in ovarian cancer and colorectal carcinoma, where peritoneal spread's prognostic impact exceeds that of tumor extent or lymph node involvement, leading to significantly adverse outcomes [(2-4)].

Hence, early detection and precise localization are critical for enabling potential surgical interventions or cytoreductive therapy prior to surgery [(5&6)].

AIM OF THE WORK

This study aims to emphasize the diagnostic superiority of positron emission tomography/computed tomography over contrast-enhanced computed tomography in detecting peritoneal deposits originating from colorectal cancer.

PATIENTS AND METHODS

Patients:

Study population: We retrospectively evaluated 55 patients with intestinal malignancy affecting any site from ileocecal valve till anus. The study was performed at the PET/CT unit in in the radiology department of Ain shams University during the period between December / 2022 and October / 2023. And Approval of the Research Ethics Committee and informed consent was obtained from all participants in the study. Privacy of all patients' data was guaranteed. We included the patients came for preoperative metastatic work up, post therapeutic assessment or annual follow up. and the following patients were excluded (Patient's age $\leq$ 18, serum glucose level $\geq$ 150 mg/dl, serum creatinine $\geq$ 1.2 mg/dl;above the normal level, Pregnancy/lactation and patients refuse participation in the study).

PET-CT protocol: Before performing PET/CT examination, the included patients were asked to avoid exercise or eating carbohydrates and to control their serum blood sugar. They were also asked to fast for a minimum of 6 hours before the examination. Upon arrival at the radiology department, patient's body weight and serum blood sugar were assessed to ensure having serum blood sugar below 150 mg/dL. And an intravenous cannula was fixed and 1 mCi of 18F-FDG/kg was given to each patient 60 minutes before the examination. For these 60 minutes, the patients stayed in the waiting room and were asked to avoid cold exposure, avoid talking, and they were asked to empty bladder before the examination. The examination was acquired using an integrated PET/CT system (GE Discovery IQ 5 rings, optima CT 540, 16 slices; Made in Waukesha, Wisconsin 53188 (USA)). and whole-body PET/CT scan began at the level of the skull and extended downwards to the mid-thighs level. As part of the routine protocol, During the PET/CT scan, each patient underwent 6-7 bed positions with 2 minutes per table position, spanning from the skull base to the femoral region. Patients were positioned supine with their arms above their heads. The scan took place 60 minutes after intravenous injection of 18F-FDG, with saline infusion performed. PET data were acquired in three-dimensional mode. Before the PET scan, contrast CT images were obtained to generate an attenuation correction map. The images were reconstructed using an ordered-subset expectation-maximization (OSEM) iterative reconstruction algorithm. The CT acquisition parameters included 140kV, 120 mAs, and a slice thickness of 5 mm. Intravenous injection of non-iodinated contrast (approximately 70-100ml; 0.1ml/kg with 30-40ml saline chaser at 3ml/s) was administered. Semi-quantitative analysis was conducted, measuring the maximum standardized uptake value (SUVmax) for each suspicious lesion.

A peritoneal lesion with uptake greater than that in the liver or surrounding tissue was considered suspicious of metastatic/peritoneal dissemination. For FDG uptake measurement, regions of interest (ROIs) were manually placed on the hepatic parenchyma (away from vessels and contrast) to determine the SUVavg threshold. Subsequently, ROIs were placed manually on the main lesion and suspected metastasis. Lesions were classified as FDG-avid or non-FDG-avid based on their SUVmax compared to the liver's SUVavg. The raw data were reconstructed using specialized workstations and software. All images were reconstructed in sagittal and coronal multiplanar planes in video mode on a workstation to obtain images with a determination of the standard uptake value (SUV) for qualitative and quantitative evaluation interpretation. Each PET/CT examination was independently analyzed by a consensus of nuclear medicine physicians and radiologists, with a focus on peritoneal lesions, correlating conventional CT images alone with fused PET/CT images. The gold standard for all patients in this study was tumor markers and follow-up (clinical and radiological) whenever possible for the peritoneal lesions. Lesions were considered positive if they showed high FDG uptake upon visual assessment.

Statistical analysis:

Statistical analysis was conducted using SPSS 27th edition, categorical variables were presented in count and percent. Quantitative variables were presented in mean, standard deviation, minimum and maximum. Paired comparison between diagnostic tools were conducted using the Mcnemar test. Diagnostic indices were calculated using 2x2 contingency tables. Any p value <0.05 was considered significant.

Ethical consideration:

The study was approved by the Research Ethical committee of faculty of medicine, Ain-shams university. with Approval Number: FMASU. M S 612 /2022.

RESULTS:

Among the included 55 patients we found that tumor markers were positive in 52 (94.5%) patients of the assessed population indicating viable tumoral tissue. and were negative in 3 (5.5%) patients which indicate absence of viable tumoral tissue. Contrast enhanced CT showed that there were 17 cases were negative for peritoneal affection, while 38 showed the peritoneal affections in form of masses or ill-defined fat smudging. PET CT showed that there were 7 (12.7%) patients with non-avid lesions, while uptake was observed in 48 (87.3%) patients. This is yielding high sensitivity of PET-CT being 90.8%, Specificity of 66.67% and accuracy of 78.5% compared to the lower sensitivity of CT being 69.23%, Specificity of 33.33% and accuracy of 51.3%.

In the current study we identified 47 (85.5%) true positive cases, 2 (3.6%) false positive cases, 5 (9.1%) false negative cases, and 1(1.8%) true negative case. Distributing the cases according to imaging findings as follow: (True positive: positive PET Avid and high tumor markers, False positive: low-avid PET, and negative markers, False negative: PET non-Avid, high tumors markers, True negative: Non-Avid PET, negative markers).

Regarding the management, surgical intervention was performed in 33 (60%) patients, 5 (9.1%) patients received radiotherapy, and 32 (58.2%) patients received chemotherapy. The extent of peritoneal affection was mainly locoregional related to the site of disease in 36 (65.5%) patients, while 19 (34.5%) patients were diagnosed with diffuse peritoneal affection. The largest proportion of specimens showed a Well differentiated adenocarcinoma, followed by moderately differentiated, and least 10.9% were poorly differentiated.

Table 1: tumor marker levels among the assessed patients.

	Count	%
Tumor markers		
Negative	3	5.5%
Positive	52	94.5%

Table 2: CT and PET findings including extent of cancer.

	Count	%
CT pattern		
Negative	17	32.1%
Mass	9	17.0%
Nodule	27	50.9%
Fat smudging	2	3.6%
Site of cancer		
Locoregional	36	65.5%
Diffuse	19	34.5%
PET Activity		
Non-Avid	7	12.7%
Avid	48	87.3%

Case 1:

(This case shows matching of PET-CT and contrast CT in their findings)

History and clinical data:

A 50-year-old male patient, known case of surgically resected ano-rectal adenocarcinoma. Received multiple cycles of chemotherapy.

CT findings:

Enhancing peritoneal soft tissue nodules seen at left deep pelvic and presacral regions as well as just below the aortic bifurcation measuring about 2.5 & 3.5cm respectively and showing faint contrast uptake.

PET CT findings:

Whole body PET CT scan showed multiple metabolically active (FDG avid) peritoneal nodules / masses located at the following sites:

- At the left deep pelvic and presacral (para-rectal) lesion is currently measuring about 2.5 cm in width and 6.3 cm in length with SUVmax 9.1.
- At the aortic bifurcation and along the course of the left common iliac artery, the lesion is measuring about 3.5 x 4.4 cm at its max. dimensions with SUVmax 8.87. It is encroaching upon / entangling the left ureter with subsequent proximal hydronephrosis.

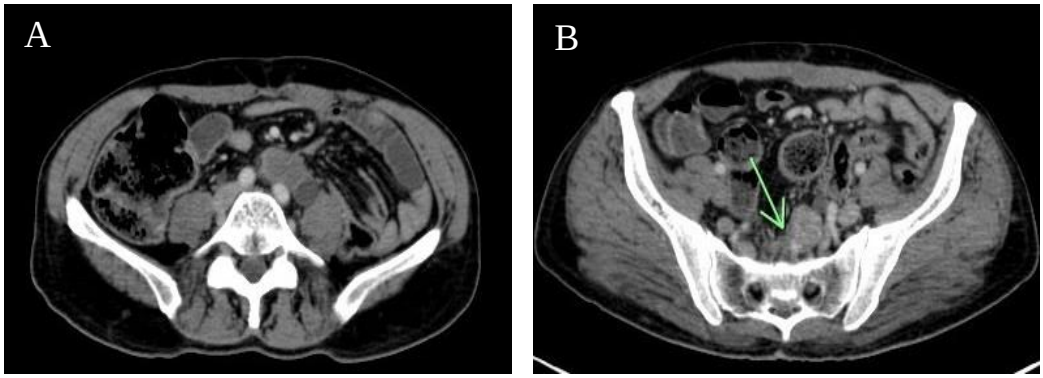

Figure 1: CT images axial cuts showing (A) the aortic bifurcation lesion and (B) the left deep pelvic lesion

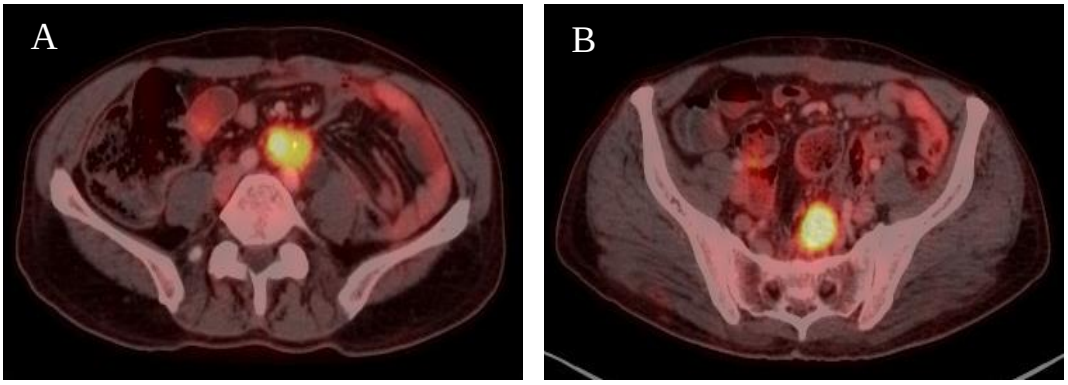

Figure 2: PET-CT images axial cuts showing (A) the aortic bifurcation lesion with suv max 8.87 and (B) the left deep pelvic lesion with suv max 9.1

Case 2:

(There's mismatch between the PET-CT and contrast CT as the peritoneal deposit not clearly visualized win the CT yet showed FDG avidity in PET-CT)

History and clinical data:

A 60-year-old female patient, known case of transverse colon adenocarcinoma. Didn't start treatment yet with no surgical intervention. for metastatic work up.

CT findings:

A large, irregular soft tissue mass lesion is observed, centered on the antero-inferior wall of the transverse colon at right lumbar region with small endo-luminal component & larger exophytic component infiltrating the overlying peritoneum and anterior abdominal wall (rectus abdominus muscle).

No definite peritoneal regional or distant deposits could be noted.

PET CT findings:

PET-CT scan showed the colonic mass and numerous metabolically active (FDG avid) peritoneal nodules / masses located at the following sites:

- A large, irregular soft tissue mass lesion is observed, centered on the antero-inferior wall of the transverse colon at right lumbar region with small endo-luminal component & larger exophytic component infiltrating the overlying peritoneum and anterior abdominal wall (rectus abdominus muscle). with max. SUV~17.8
- Small metabolically active FDG avid soft peritoneal tissue nodule is seen at the left lumbar region; beneath the anterior abdominal wall; measuring about 1.1 cm; with max. SUV~3.4. (Which is not visualized in the CT).

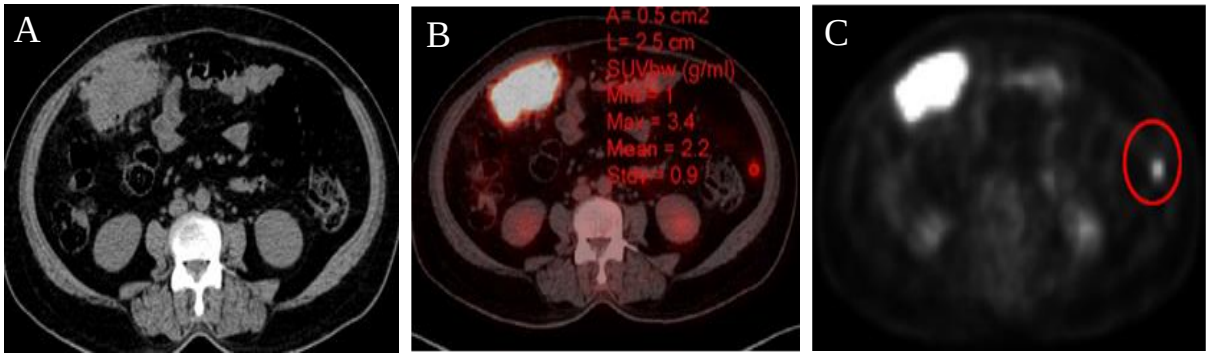

Figure 3: (A) CT images axial cuts showing large exophytic soft tissue lesion of the transverse colon, (B) PET-CT axial cuts shows the transverse colon soft tissue lesion with suv max 17.8 and left lumbar peritoneal nodule with suv max 3.4, (C) PET image showing only the activity of the lesions.

Case 3:

(Both the PET-CT and CT showed matched findings, yet it seemed to be false positive findings as detailed below)

History and clinical data:

A 58-year-old male patient, A known case of cancer rectum received RTH then underwent surgical excision with anastomosis a year ago; followed by CTH (3 cycles).

Post-operative status showing:

CT findings:

Clear operative bed with no evidence of nodal or distant metastatic lesions could be detected all over the surveyed body apart from the presacral soft tissue thickening and smudged fat (the arrow).

PET CT findings:

- No metabolically active FDG avid colorectal masses nor abnormal mural thickening.
- Low grade pre-sacral soft tissue sheets/thickening with peri-rectal fat smudging (max. SUV~1.8); post therapeutic/operative sequel) (the circle).
- No metabolically active FDG avid enlarged regional LNs.

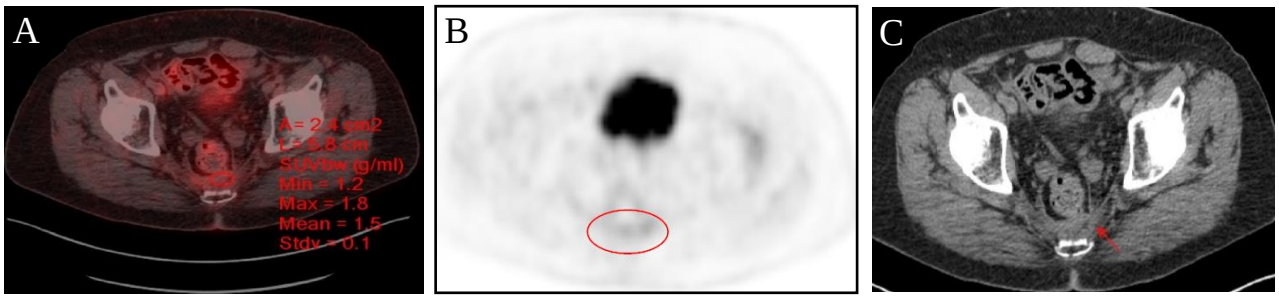

Figure 4: (A) PET-CT images axial cuts showing no metabolic activity of the operative bed, (B) the PET images showing no activity, (C) the CT axial images showing the fatstranding at the operative bed

Follow up study of the previous case after 6 months, both CT & PET/CT images revealed:

Still noted:

- Ct findings of operative bed fat smudging (the arrow).
- No metabolically active FDG avid colorectal masses nor abnormal mural thickening.
- The previously noted low grade pre-sacral soft tissue sheets/thickening with peri-rectal fat smudging is still seen with (max. SUV~1.6) in today's study, the previous was (max. SUV~ 1.8).
- No metabolically active FDG avid enlarged regional LNs.

This is case shows most probably post-operative fibrosis evident by (negative tumor markers with stationary or regressive course of the metabolic activity with no changes in the morphology.

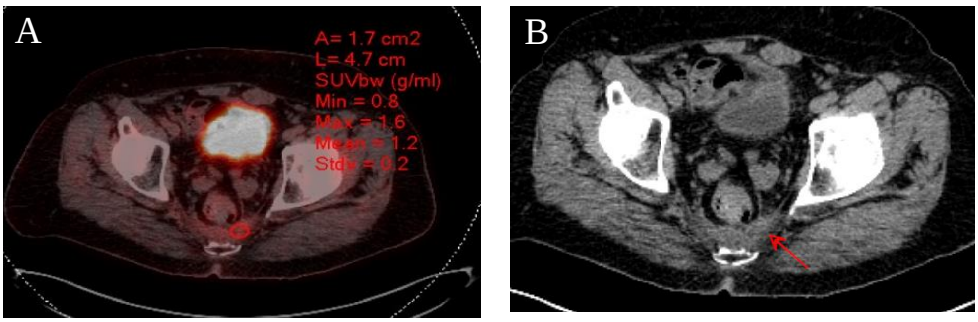

Figure 5:(A) PET_\-CT image and (B) CT images axial cuts follow up images still show no activity or morpholgic changes at teh operative bed

DISCUSSION:

Tumor deposits in the peritoneum are typically small, varying in size and appearance. They can manifest as discrete masses, small nodules, flat plaques, or large, thin sheets of tumor cells. In the early stages, the disease may only be detectable under a microscope and may be confined to the ascitic fluid. As the disease advances, it can spread along the peritoneum, affecting the visceral surfaces, or causing thickening of the omentum or mesentery. Tumor seeding in the peritoneum can occur through the bloodstream, lymphatic system, or direct local extension. The diverse presentation of tumors in terms of appearance, location, and mode of spread in the abdomen poses a challenge in diagnosing peritoneal carcinomatosis [7&8].

Conventional CT scanning, a common preoperative imaging method for diagnosing peritoneal metastases, exhibits variable sensitivity. The CT's ability to accurately detect tumors may rely on factors like tumor location, size, morphology, and other characteristics. In contrast, 18F-FDG PET has shown significantly higher sensitivities compared to CT in assessing peritoneal tumor recurrence in colorectal cancer cases. Promising results have also been observed in the evaluation of other tumor types [9&10].

FDG PET/CT has significantly enhanced the staging process and the reevaluation of different malignancies by precisely identifying primary lesions and distant metastases with exceptional accuracy [11].

However, Certain types of gastrointestinal cancers, such as signet ring cell carcinoma and mucinous adenocarcinoma, often exhibit low uptake of fluorodeoxyglucose (FDG) as tumors. Moreover, the digestive system typically demonstrates normal FDG uptake, which presents challenges in obtaining images with adequate contrast to detect lesions in this area [12-14].

Distinguishing between post-therapy changes like surgical scarring and post-radiation fibrosis and disease recurrence poses a significant challenge in patients with colorectal cancer (CRC). This challenge is particularly notable in distal colon and rectal tumors, where presacral scarring and pelvic alterations are common. Serial examinations using conventional imaging are often necessary to detect slowly developing changes over time. FDG PET performed 6 months after surgery reveals metabolic activity in the presacral space indicative of tumor recurrence, while postsurgical changes are not hypermetabolic. FDG PET is accurate in distinguishing between benign and malignant presacral changes and surpasses CT and MR imaging in this aspect. Metabolic imaging offers the advantage of requiring only a single study for determination, unlike serial morphologic studies often needed with conventional imaging. However, PET alone has limitations due to anatomical changes resulting from surgery. *Even-Sapir et al.* demonstrated the additional value of PET-CT in detecting pelvic recurrence six months or more after surgical removal of rectal cancer [15].

Therefore, we conducted a cross-sectional study to assess the accuracy of (18) F-FDG positron emission tomography/ computed tomography (PET/CT) in detecting and assessing peritoneal deposits of colorectal origin, comparing it to contrast-enhanced computed tomography (CT).

We enrolled 55 patients who were diagnosed with colon adenocarcinoma and were assessed by contrast enhanced CT scan, and PET-CT sequentially, patients were assessed in the radiology department of Ain shams university during the period between 2022 and 2023.

In the present study, Tumor markers were positive in 52 patients of the assessed

population indicating viable tumoral tissue. and were negative in 3 patients of the assessed population. PET CT showed that there were 7 of patients with non-avid lesions while uptake was observed in 48 (87.3%) of patients.

Among these patients there were 7 patients that didn't record any metabolic activity within the PET-CT scan yet with very high tumor markers, so we reviewed the PET-CT images again and we found small hidden non FDG avid peritoneal deposits and in correlation with the pathology results of these patients, we found that they had mucinous adenocarcinoma type of tumor which is in most cases is metabolically inert or shows very low or insignificant avidity that's why they were non avid in our study.

And also 2 cases showed findings in CT that were metabolically active in PET-CT yet with negative tumor markers, and on follow up of these patients these metabolically active changes have resolved which is suggesting that they were just post-operative inflammatory or reactionary changes that have resolved by time on serial follow up.

Our findings were consistent with *Kim et al*., who enrolled 46 patients with suspected peritoneal disease, only 26 were positive by histopathology, PET accurately detected 25 of 26 patients and enhanced abdominal CT correctly detected 23 of 26 patients, The sensitivity and specificity of PET/CT for diagnosing peritoneal carcinomatosis were 96.2% and 90%, respectively, while for enhanced abdominal CT, they were 88.5% and 65%, respectively. The precision of PET/CT was significantly superior to that of enhanced abdominal CT (93.5% vs 78.3%, P = 0.039). Four anomalous PET/CT results were seen, characterized by the presence of a single nodule, several nodules, diffuse uptake, and a combination of aberrant FDG uptakes. These findings were consistent with pathological observations [(16)].

Our findings align with those of *Higashi et al*., who demonstrated that FDG PET exhibits lower sensitivity in detecting primary and recurrent mucinous carcinoma compared to tumors commonly found in the gastrointestinal tract and lung. Their study revealed 9 false-negative results among 22 patients with mucinous carcinoma. The apparent insensitivity of FDG PET in detecting mucinous carcinoma is unsurprising considering the tracer's localization mechanism in tumors. and suggests that the tumor's relative cellularity plays a crucial role in disease detection using FDG PET, as demonstrated in an in vitro study of an adenocarcinoma cell line [(17)].

In contrast to our findings, Mikawy and his team assessed 70 patients referred for PET CT as a preoperative assessment, the visibility of peritoneal deposits on conventional CT images was reassessed in all cases. Out of the total number of patients, 47.1% of patients had deposits that were not detectable on CT scans, whereas 27 patients (38.6%) had visible deposits, 14.3% of patients did not have any peritoneal deposits. The conventional CT method exhibited an accuracy rate of 52.85%, a sensitivity rate of 45%, and a specificity rate of 100% for detecting peritoneal deposits. The PET CT procedure demonstrated an accuracy rate of 94.3%, a sensitivity rate of 96%, and a specificity rate of 80% [(18)].

Dirisamer et al. conducted a study on 62 patients who were believed to have peritoneal carcinomatosis. They utilized FDG PET/CT and determined that it had a high diagnostic value, boasting a sensitivity of 100%, specificity of 97%, and accuracy of 98%. The findings of this study align with the current results and jointly demonstrate the outstanding efficacy of PET/CT in diagnosing peritoneal carcinomatosis caused by ovarian cancer [(19)].

In the study by *Lim et al*., the analysis of the original preoperative data showed that CT had a higher sensitivity (76.5% vs. 35.3%)

and lower specificity (91.6% vs. 98.9%) compared to PET imaging. However, both CT and PET imaging had identical accuracy (89.3%) [20].

Turlakow et al. have documented the increased sensitivity of PET compared to CT in their study, which involved patients with various types of malignancies. Similarly, *Tanaka et al*. demonstrated that PET exhibits higher sensitivity than CT in evaluating peritoneal recurrence of colorectal tumors [21].

Limitations:

The limitation in our study We believe that relatively small sample size and inclusion of patients with cancer colon could contribute to difficult reproducibility of our findings, as well, we didn't compare CT and PET referred to histopathology of peritoneal nodules which would have affected the diagnostic indices of both imaging modalities and tumor markers, low number of true negative cases has contributed to the low specificity of both imaging modalities.

Conclusion:

Evaluating peritoneal deposits with 18F-FDG PET is feasible and beneficial. Our study highlights that 18F-FDG PET markedly improves the detection of this disease compared to CT scanning alone. It proves to be a valuable diagnostic tool, particularly in cases where peritoneal biopsy is not feasible or appropriate for patients with colorectal cancer.

Conflict of interest:

This study has no conflict of interest was encountered in this study.

REFERENCES:

1. **Patel CM, Sahdev A, Reznek RH.** CT, MRI and PET imaging in peritoneal malignancy. Cancer Imaging. 2011;11(1):123.
2. **Dawson H, Kirsch R, Messenger D, et al.** A review of current challenges in colorectal cancer reporting. Archives of pathology & laboratory medicine. 2019; 143(7):869-82.
3. **Pai RR, Shenoy KD, Minal J, et al.** Use of the term atypical cells in the reporting of ascitic fluid cytology: A caveat. CytoJournal. 2019;16.
4. **Wang W, Tan GH, Chia CS et al.** Are positron emission tomography-computed tomography (PET-CT) scans useful in preoperative assessment of patients with peritoneal disease before cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC)? International Journal of Hyperthermia. 2018; 34(5):524-31.
5. **Elekonawo FM, Starremans B, Laurens ST, et al.** Can (18 F) F-FDG PET/CT be used to assess the pre-operative extent of peritoneal carcinomatosis in patients with colorectal cancer? Abdominal Radiology. 2020; 45:301-6.
6. **Pletcher E, Gleeson E, Labow D.** Peritoneal cancers and hyperthermic intraperitoneal chemotherapy. Surgical Clinics. 2020; 100(3):589-613.
7. **Franko J.** Therapeutic efficacy of systemic therapy for colorectal peritoneal carcinomatosis: surgeon's perspective. Pleura and peritoneum. 2018; 3(1):20180102.
8. **Lu L, Mullins CS, Schafmayer C, et al.** A global assessment of recent trends in gastrointestinal cancer and lifestyle-associated risk factors. Cancer Communications. 2021; 41(11):1137-51.
9. **Hugen N, Van de Velde CJ, De Wilt JH, et al.** Metastatic pattern in colorectal cancer is strongly influenced by histological subtype. Annals of oncology. 2014; 25(3):651-7.
10. **Koppe MJ, Boerman OC, Oyen WJ, et al.** Peritoneal carcinomatosis of colorectal origin: incidence and current treatment strategies. Annals of surgery. 2006; 243(2):212.
11. **Low RN.** MR imaging of the peritoneal spread of malignancy. Abdom Imaging. 2007; 32:267–83.

12. **Kim SJ and Lee SW.** Diagnostic accuracy of (18)F-FDG PET/CT for detection of peritoneal carcinomatosis; a systematic review and meta-analysis. Br J Radiol. 2018;91(1081):20170519.
13. **Lopez-Lopez V, Cascales-Campos PA, Gil J, et al.** Use of 18F-FDG PET/CT in the preoperative evaluation of patients diagnosed with peritoneal carcinomatosis of ovarian origin, candidates to cytoreduction and hipec. A pending issue. European journal of radiology. 2016; 85(10):1824-8.
14. **Suzuki A, Kawano T, Takahashi N, et al.** Value of 18 F-FDG PET in the detection of peritoneal carcinomatosis. European journal of nuclear medicine and molecular imaging. 2004; 31:1413-20.
15. **Dekker E, Tanis PJ, Vleugels JLA, et al.** Colorectal cancer. Lancet (London, England) 2019;394(10207):1467–1480. doi: 10.1016/S0140-6736(19)32319-0.
16. **Kim HW, Won KS, Zeon SK, et al.** Peritoneal Carcinomatosis in Patients with Ovarian Cancer: Enhanced CT Versus: 18: F-FDG PET/CT. Clinical Nuclear Medicine. 2013; 38(2):93-7.
17. **Higashi K, Clavo AC, Wahl RL.** Does FDG uptake measure proliferative activity of human cancer cells? In vitro comparison with DNA flow cytometry and tritiated thymidine uptake. J Nucl Med 1993; 34:414–419
18. **Mikawy NN and Elnaggar HT.** Peritoneal deposits: PET/CT the keen observer. Egyptian Journal of Radiology and Nuclear Medicine. 2023; 54(1):88.
19. **Dirisamer A, Schima W, Heinisch M et al.** Detection of histologically proven peritoneal carcinomatosis with fused 18F-FDG-PET/MDCT. European journal of radiology. 2009; 69(3):536-41.
20. **Lim JS, Kim MJ, jin Yun M, et al.** Comparison of CT and 18F-FDG pet for detecting peritoneal metastasis on the preoperative evaluation for gastric carcinoma. Korean journal of radiology. 2006; 7(4):249-56.
21. **Tanaka T, Kawai Y, Kanai M, et al.** Usefulness of FDG-positron emission tomography in diagnosing peritoneal recurrence of colorectal cancer. The American journal of surgery. 2002; 184(5):433-6.

القيمه المضافه لاستخدام التصوير المقطعي بالاصدار البوزيتروني باستخدام ماده فلوريد الجلوكوز18 المشعه مقارنه بالتصوير المقطعي بالصبغه في اكتشاف تقييم بؤر الغشاء البريتوني المنقوله من اورام القولون والمستقيم الخبيثه

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قسم الأشعه التشخيصيه والتداخليه - كليه الطب جامعه عين شمس

المقدمه: تشكل تشخيص سرطان الغشاء البريتوني الناجم عن سرطان القولون تحديًا كبيرًا في التصوير الأورامي. تهدف هذه الدراسة الاستعادية إلى تقييم فعالية التصوير المقطعي المحسن بالتباين (MDCT) مقارنةً بتصوير الانبعاث الإيجابي بالإيجابية/التصوير المقطعي بالكمبيوتر مع F18-فلوروديوكسيغلوكوز ((18F) FDG-PET/CT) في كشف البذور البطنية.

الهدف: تهدف دراستنا إلى التأكيد على القيمة التشخيصية لتصوير الانبعاث الإيجابي بالإيجابية/التصوير المقطعي مقارنهب التصوير المقطعي المحسن فقط في تحديد الثانويات السرطانيه بالغشاء البريتوني التي تعود إلى سرطان القولون بين المرضى الذين تم تشخيصهم بالفعل بسرطان القولون.

المرضي وطرق البحث: قمنا بتقييم بأثر رجعي 55 مريضا يعانون من ورم خبيث في الأمعاء بدايه من الصمام اللفائفي الأعوري حتى فتحة الشرج مع متوسط عمر المريض 56.4 ± 12 سنة، اعمار تتراوح بين 32-78 سنة. وكان للذكور النسبة الأكبر من المرضى المشمولين بنسبة 64.5% مقابل 35.5% للإناث. تم إجراء الدراسة في وحدة التصوير المقطعي بالانبعاث البوزيتروني (PET/CT) بقسم الأشعة بجامعة عين شمس خلال الفترة ما بين 2022 و2023.

النتائج: من بين 55 مريضًا تم تشخيصهم بسرطان القولون مع الشكوك بوجود ثانويات بالغشاء البريتوني، كانت النتائج إيجابية لـ 49 مريضًا في 18F-FDG PET، وكانت 2 من هذه الفحوصات إيجابية خاطئة حيث كانت مرتبطة بدلالات اورام سالبة. في حين أظهر 6 مرضى عدم تشبع في PET-CT، حيث كانت 5 منهم نتائج سلبية خاطئة؛ مرتبطة بدلالات اورام مرتفعه وكان هناك حالة سلبية صحيحة؛ حيث كانت دلالات الاورام سالبة. هذا أدى إلى حساسية PET-CT تبلغ 90.8٪، وتحديد خاصية بنسبة 66.67٪ ودقة بنسبة 78.5٪ مقارنةً بحساسية تصوير CT المحسن بالتباين تبلغ 69.23٪، وتحديد خاصية 33.33٪ ودقة 51.3٪. وتؤكد هذه النتائج تفوق PET/CT بشكل كبير على وسائل التصوير التقليدية (تصوير CT المحسن بالتباين) في تشخيص سرطان الغشاء البطني.

الخلاصه: يتفوق التصوير المقطعي بالإصدار البوزيتروني المدمج بالتصوير المقطعي على التصوير المقطعي بالصبغه في كشف الثانويات الغشاء البريتوني وبالتالي، فإن له القدره على تقليل ضرورة إجراء العمليات الجراحية وتسهيل اختيار دقيق للمرضى المؤهلين للعلاج الكيميائي المساعد.