

Colorectal Cancer Follow up

PET/CT – Supporting the
GOLD STANDARD



**In the establishment of any cancer
treatment **Center of Excellence**
PET/CT is a major tool in
achieving that goal.**



FDG-PET/CT in Colorectal Cancer

- **The rationale for tumor imaging with FDG (18F-fluorodeoxyglucose) is based on the fundamental property of tumors, namely, increased glucose metabolism.**
- **Established reimbursed indications for FDG-PET include:**
 - **Initial Diagnosis**
 - **Staging**
 - **Restaging**



FDG-PET/CT in Staging Colorectal Cancer

- The expectation of cure depends on the stage of the initial tumor.
- Assessment of tumor extent and the presence or absence of adenopathy are essential to the determination of prognosis and the risk for tumor recurrence.
- FDG-PET/CT imaging is best used to more accurately stage disease before attempted curative resection or to confirm equivocal findings on conventional imaging studies before initiating tx.



FDG-PET/CT in Staging Colorectal Cancer (continued)

- **FDG-PET/CT:**
 - **Has excellent sensitivity (89%-91%) and is more accurate than CT for the detection of liver metastases.**
 - **Superior to conventional imaging for detecting extrahepatic metastases with a sensitivity of 94% vs 67% for conventional imaging.**
 - **Can change patient management in 26%-65% of cases by identifying a resectable or non-resectable metastasis that was unsuspected clinically, not seen, or equivocal on CT.**



FDG-PET/CT in Staging Colorectal Cancer (continued)

- **FDG-PET/CT impact:**
 - Recent study by Seltzer et al demonstrated that changes in the clinical stage were reported for 42% of the cases, and of these, the disease was upstaged in 80% and 20% downstaged.
 - In cases of recurrent disease, PET/CT contributed to intermodality (e.g. surgery to radiation) management changes in 37% of the patients, and to intramodality (e.g. types of chemotherapeutic agents) changes in 18% of the cases.



FDG-PET/CT in Restaging Colorectal Cancer

- In patients who undergo curative surgery, approx. 40% will demonstrate recurrence within two years of diagnosis.
- Non-invasive differentiation between malignant and benign lesions remain a diagnostic challenge for conventional imaging – which are fairly sensitive but poorly specific.
- The challenge increases significantly when the area in question is a postsurgical site, where fibrosis and scar formation may be present.



FDG-PET/CT in Restaging Colorectal Cancer (continued)

- CEA may detect recurrence but does not show the site in question, and the disease may not be resectable.
- Studies have shown that CT may have a sensitivity and specificity as low as 42% and 50%.
- FDG-PET/CT:
 - Has been shown to detect clinically silent disease in patients with increasing CEA and negative CT scans.
 - Is both highly sensitive and specific in differentiating recurrence from postoperative fibrosed tissue. FDG-PET/CT's reported sensitivity is between 95% and 100% and specificity between 86% and 92%.



FDG-PET/CT in Selection of Patients for Resection of Hepatic Metastases

- **Colorectal cancer is the most common metastatic cancer to occur in the liver.**
- **Partial hepatic resection is established as the optimal treatment.**
 - **Preoperative unidentified extrahepatic disease is responsible for relapse in approx. 50% of these patients**
 - **Therefore, candidates for resection should have anatomically resectable liver lesions and be free of extrahepatic disease.**



FDG-PET/CT in Selection of Patients for Resection of Hepatic Mets (cont.)

- The role of preoperative imaging in patient selection is capital:
 - It will identify the subgroup of patients who may benefit from surgery.
 - It should prevent unnecessary surgery in those that will not benefit especially if the operative mortality could be as high as 7%.
- FDG-PET/CT will:
 - improve the selection of patients for partial hepatic resection by optimizing the detection of extrahepatic tumor foci throughout the body.
 - Reduce the morbidity and mortality associated with inappropriate surgery.



PET/CT in Colorectal Cancer A Summary

- PET/CT has been proven to be more accurate than contrast enhanced CT in staging colorectal cancer – especially in M-staging – owing to PET/CT's superior detection of distant metastases.
- PET/CT has shown superior performance in TNM staging compared to CT alone.
- PET/CT excels in identification of non-FDG avid lesions prior to surgery.
- PET/CT has also shown significant potential in monitoring treatment response in hepatic metastases.



PET/CT and Colorectal Cancer A Summary (cont.)

- **FDG-PET/CT scanning:**
 - evaluates abdomen, chest, and pelvis in one examination setting, permitting identification of local recurrence as well as distant metastasis.
 - is also highly sensitive in detecting hepatic and extra-hepatic metastasis.
 - can distinguish post-treatment (postoperative and post-radiation therapy) scarring from recurrent tumors since malignant tumors are metabolically active and FDG-avid on PET/CT imaging while scar tissue is not. **A Baseline PET/CT prior to surgery is a must.**
- This high accuracy in identifying early stage recurrent tumors with FDG-PET/CT is crucial for potential surgical cure and improving patient outcomes.

