

The Role of Positron Emission Tomography/Computed Tomography in the Initial Staging of Colon Cancer

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See Article on Page 23-27

Positron emission tomography (PET) is a functional imaging technique that uses short-lived radioisotopes attached to a tracer to examine abnormal biochemical processes associated with diseases. The most commonly used radiopharmaceutical in PET is ¹⁸F-fluorodeoxyglucose, which acts as an analogue of glucose and can be used to identify tissues showing increased glucose transport and metabolism, such as cancer cells [1]. PET/computed tomography (CT) is a technique that produces a fused image by combining PET and CT images, which can overcome the drawback of a PET image which lacks fine anatomical definition. However, PET/CT is not helpful for patients with a mucinous carcinoma which has a low metabolic rate, and it cannot differentiate inflammation from cancer tissue.

Accurate initial staging of colon cancer is essential for appropriate treatment. Especially, determining the presence or absence of synchronous distant metastasis is very important because the treatment strategy should be changed according to that result. Estimates of the sensitivity and the specificity of PET/CT in diagnosing liver metastasis are reported to be 87%–100%, and 75%–100%, respectively, which are equal or superior to those reported for contrast-enhanced CT [1-3]. Sometimes, PET/CT may detect another metastasis that has not been found using conventional imaging modalities, and that may change the treatment strategy. However, such cases are not common, and they have been reported to occur in only about 3%–4% of all primary colon cancer

patients [4]. Thus, including PET/CT in the routine staging of all patients diagnosed with colon cancer seems to be unreasonable.

If a distant metastasis is suspected in a conventional imaging study such as CT, the role of additional PET/CT is that it can exclude some false positive cases and detect other distant metastases. In those cases, according to the PET/CT results, the treatment strategies may be changed. Thus, it is recommended that PET/CT be performed before deciding the treatment strategy for metastatic colon cancer. As for evaluating lymph-node metastasis, in most of the patients with colon cancer, the treatment strategy is not changed by the clinical status of lymph-node metastasis. Thus, predicting lymph-node metastasis does not have any clinical significance. In addition, the accuracy of predicting lymph-node metastasis is low.

Another role of PET/CT is incidental detection of other diseases, such as stomach cancer, thyroid diseases, and other malignancies. However, in most cases, the discovery of these incidentally-founded diseases does not change the treatment strategy of colon cancer, so it is unreasonable to perform routine PET/CT simply for that reason.

In conclusion, currently, PET/CT is only recommended for the assessment of suspected recurrence of colon cancer and for the assessment of the other distant metastases before resection of metastatic lesions. Furthermore, routine PET/CT is not recommended for initial evaluation of all patients with primary colon cancer. Because cases where some unsuspected metastases or other diseases are found, which may result in a change in the treatment strategy, are rare. Therefore, as the authors mentioned in their conclusion, more studies on selecting patients who might benefit from PET/CT for initial staging are needed [5].

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