

Case report

Lynch Syndrome Associated Colon Adenocarcinoma Resembling Lymphoma on Fluoro-Deoxyglucose-Positron Emission Tomography/Computed Tomography

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Abstract

The patient was a 46-year-old Asian male diagnosed with lynch syndrome associated colon adenocarcinoma in the right ascending colon. A presurgical staging 18-fluoro-deoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT) found increased metabolic activity in the cervical, axillary, mediastinal, supraclavicular, para-aortic and mesenteric lymph nodes. This pattern of metastasis was very unusual for lynch syndrome associated colon adenocarcinoma and the involvement of those lymph nodes resembles the pattern of spread of lymphoma. He underwent right hemicolectomy and he was subsequently treated with 12 cycles of folinic acid (leucovorin), fluorouracil (5-FU), irinotecan. A restaging FDG-PET/CT at the end of the chemotherapy showed interval decrease in size and metabolic activity in the affected lymph nodes. FDG-PET/CT is a useful imaging modality in following-up the treatment response in colon adenocarcinoma.

Keywords: 18-fluoro-deoxyglucose-positron emission tomography/computed tomography, colon adenocarcinoma, lymph nodes, lymphoma, lynch syndrome

Introduction

The lynch syndrome is an autosomal dominant condition due to a germline mutation in one of the mismatch repair genes and it is responsible for 1–3% of all colorectal cancers.^[1] The liver, and regional lymph nodes are the most common sites of metastasis for colon cancer.^[2] positron emission tomography/computed tomography (PET/CT) combines functional PET with high resolution CT image on the same axis and correcting attenuation automatically.

Case Report

The patient was a 46-year-old Asian male who presented with blood in his stool. A 4 cm mass in the right ascending colon, near the hepatic flexure was found and biopsied by colonoscopy and pathology confirmed it as adenocarcinoma. The pathology report also revealed BRAF-wild type, Kirsten rat sarcoma (KRAS)-wild type and microsatellite instability-high (MSI-H) tumor, and a diagnosis of lynch syndrome was made. A presurgical staging 18-fluoro-deoxyglucose-PET/CT (FDG-PET/CT) found increased metabolic activity in the cervical, axillary, mediastinal, supraclavicular, para-aortic and mesenteric lymph nodes [Figures 1 and 2]. He underwent a right hemicolectomy. Fine needle aspiration of the cervical, axillary, mediastinal, supraclavicular, and para-aortic lymph nodes was done and the results were consistent with metastatic colon adenocarcinoma. He had chemotherapy with folinic acid (leucovorin),

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fluorouracil (5-FU), irinotecan (FOLFIRI). After 12 cycles of FOLFIRI, a restaging FDG-PET/CT found interval decrease in size and metabolic activity in cervical, mediastinal, axillary, supraclavicular and mesenteric lymph nodes [Figures 3 and 4]. Four additional cycles of chemotherapy are planned for this patient.

Discussion

The lymphadenopathy in cervical, supraclavicular, axillary, mediastinal and para-aortic nodes resembles the pattern of spread of lymphoma, particularly the Hodgkin's lymphoma.^[3] Colon adenocarcinoma metastasizing to the combination of axillary, supraclavicular and mediastinal lymph nodes is very unusual. Our case was rare because cancer cells skipped natural filters such as the liver and lungs and spread to supra-diaphragmatic lymph nodes. Primary breast cancer accounts for 97% of metastases

to the axillary lymph nodes and 51% of metastases to the supraclavicular lymph nodes.^[4] Moreover, primary lung cancer is responsible for 62% of metastases to the mediastinal lymph nodes.^[4] Colorectal cancers rarely metastasize to mediastinal lymph nodes.^[5]

One of the key characteristics of lynch syndrome associated colon cancer is that patients experience fewer metastases.^[6] Mucinous, signet ring type, and poorly differentiated histological types are more aggressive than adenocarcinoma and they are more prone to distant metastases.^[1] Our patient had BRAF-wild type, KRAS-wild type and MSI-H tumor. MSI-H has been associated with lower incidence of lymphatic metastasis and BRAF and KRAS mutations are associated with distant metastasis.^[7] Our patient was treated with FOLFIRI and he has shown good response to therapy. However, there is very little data on the effect of chemotherapy in Lynch Syndrome associated colon



Figure 1: Maximum intensity projection image showing widespread metastasis in the bilateral cervical, supraclavicular, axillary, mediastinal and mesenteric lymph nodes. This pattern mimics the spread of lymphoma



Figure 3: Maximum intensity projection image showing interval decrease in size and metabolic activity in the affected lymph nodes after chemotherapy

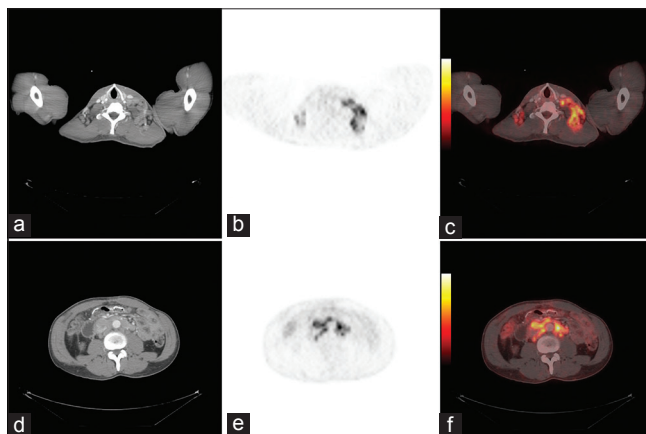


Figure 2: (a-c) Axial cuts of pretreatment 18-fluoro-deoxyglucose-positron emission tomography/computed tomography scan showing increased metabolic activity in the right and left supraclavicular lymph nodes. The standardized uptake value (SUV) max on the right side measured 9.1. (d-f) Increased metabolic activity in the retroperitoneal lymph nodes. The SUV max was 7.4

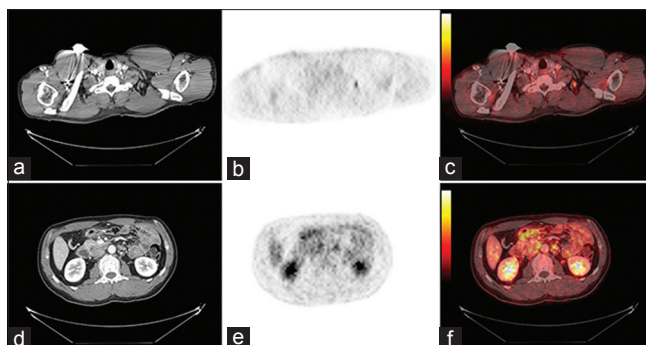


Figure 4: (a-c) Axial cuts of 18-fluoro-deoxyglucose (FDG)-positron emission tomography/computed tomography scan showing interval decrease in size and metabolic activity in the supraclavicular lymph nodes. (d-f) Decreased FDG uptake in the retroperitoneal lymph nodes. The standardized uptake value max measured 4.3

cancer because very few patients with metastatic disease are currently being identified.^[8]

Computed tomography is still the most commonly used imaging technique for detecting recurrence and monitoring treatment response in colorectal cancer.^[9] The diagnosis of nodal metastasis by CT is based on detection of nodal enlargement, with the size criterion of >1 cm. A meta-analysis by Maas *et al.* found that FDG-PET/CT is the most accurate imaging modality for assessment of distant disease in colorectal cancer.^[10]

Conclusion

Lynch Syndrome associated colon adenocarcinoma can present with a wide spread lymphadenopathy that resembles lymphoma. FDG-PET/CT can scan the whole body for metastases in one exam whereas; serial CTs are required to accomplish the same task. It relies on changes in metabolic activity of tissues so it can detect pathology even before anatomic changes are apparent. It does not require any contrast agents. FDG-PET/CT is a useful imaging modality in following-up the treatment response in colon adenocarcinoma.

References

1. Stigliano V, Sanchez-Mete L, Martayan A, Anti M. Early-onset colorectal cancer: A sporadic or inherited disease? *World J Gastroenterol* 2014;20:12420-30.
2. Labianca R, Beretta GD, Kildani B, Milesi L, Merlin F, Mosconi S, *et al.* Colon cancer. *Crit Rev Oncol Hematol* 2010;74:106-33.
3. Roth SL, Sack H, Havemann K, Willers R, Kocsis B, Schumacher V. Contiguous pattern spreading in patients with Hodgkin's disease. *Radiother Oncol* 1998;47:7-16.
4. Hess KR, Varadhachary GR, Taylor SH, Wei W, Raber MN, Lenzi R, *et al.* Metastatic patterns in adenocarcinoma. *Cancer* 2006;106:1624-33.
5. Matsuda Y, Yano M, Miyoshi N, Noura S, Ohue M, Sugimura K, *et al.* Solitary mediastinal lymph node recurrence after curative resection of colon cancer. *World J Gastrointest Surg* 2014;6:164-8.
6. Drescher KM, Sharma P, Lynch HT. Current hypotheses on how microsatellite instability leads to enhanced survival of Lynch Syndrome patients. *Clin Dev Immunol* 2010;2010:170432.
7. Rasuck CG, Leite SM, Komatsuzaki F, Ferreira AC, Oliveira VC, Gomes KB. Association between methylation in mismatch repair genes, V600E BRAF mutation and microsatellite instability in colorectal cancer patients. *Mol Biol Rep* 2012;39:2553-60.
8. Vasen HF, Möslein G, Alonso A, Bernstein I, Bertario L, Blanco I, *et al.* Guidelines for the clinical management of Lynch syndrome (hereditary non-polyposis cancer). *J Med Genet* 2007;44:353-62.
9. Guillem JG, Puig-La Calle J Jr, Akhurst T, Tickoo S, Ruo L, Minsky BD, *et al.* Prospective assessment of primary rectal cancer response to preoperative radiation and chemotherapy using 18-fluorodeoxyglucose positron emission tomography. *Dis Colon Rectum* 2000;43:18-24.
10. Maas M, Rutten IJ, Nelemans PJ, Lambregts DM, Cappendijk VC, Beets GL, *et al.* What is the most accurate whole-body imaging modality for assessment of local and distant recurrent disease in colorectal cancer? A meta-analysis: Imaging for recurrent colorectal cancer. *Eur J Nucl Med Mol Imaging* 2011;38:1560-71.

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