

## Case Report

### Sarcoidosis as Hepatic, Splenic, and Para-aortic Lymph Nodules, Mimicking Colon Cancer Metastases: A Case Report

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#### Abstract

**Background:** Sarcoidosis is a multisystem disease characterized by the presence of non-caseating granulomas in affected organs. And it affects mainly pulmonary system, but also abdominal organs. An association between sarcoidosis and malignant neoplasms were reported.

**Case Presentation:** A 62-year-old female was diagnosed advanced ascending colon cancer and sarcoidosis, but hepatic and splenic multiple lesions and para-aortic lymph nodules could not be distinguished between colon cancer metastases from sarcoidosis in only imaging study. Right hemicolectomy was required to avoid bowel obstruction, and hepatic and splenic lesions, and para-aortic lymph node resection was performed simultaneously, and they were diagnosed as sarcoidosis not metastases of colon cancer with intraoperative pathological examination. The current study presents a case of sarcoidosis manifesting as multiple organs nodules, which was difficult to differentiate from colon cancer metastases.

**Conclusions:** The differential diagnosis between the hepatic and splenic sarcoidosis and the hepatic and splenic metastases of colorectal cancer with only imaging study is very difficult. The lesions of liver or spleen are revealed in colorectal cancer patient, and if imaging inspection is not typical of metastases of colorectal cancers, sarcoidosis should be considering as a differential diagnosis.

**Keywords:** Colon Cancer; Hepatic Sarcoidosis; Splenic Sarcoidosis

#### Abbreviations

CT	:	Computed tomography
CEA	:	Carcinoembryonic antigen
PET	:	Positron-emission tomography
FDG	:	Fluoro deoxy glucose
SUV max:		Standardized uptake value max
EUS-FNA:		Endoscopic ultrasound fine needle aspiration
MRI	:	Magnetic resonance imaging

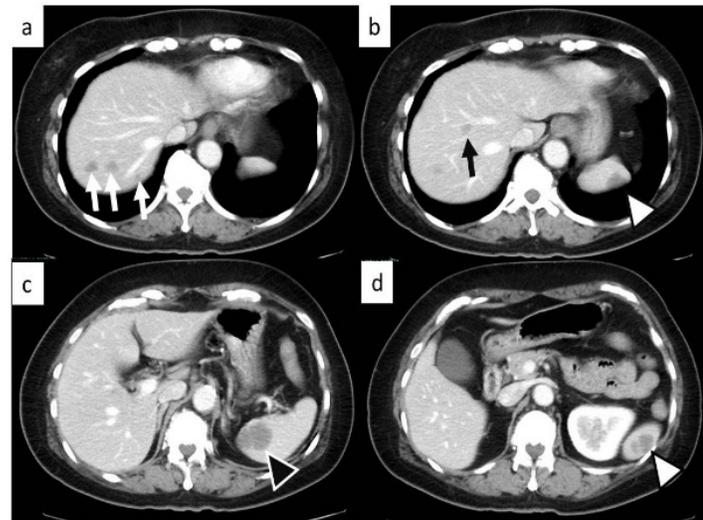
#### Introduction

Sarcoidosis is a systemic disorder of unknown etiology that is characterized by non-caseating granulomas [1]. The pulmonary system is the most common site of involvement, and is affected in about 90% of cases [2]. At the same time, an association between sarcoidosis and malignant neoplasms were reported. But, the relationship remains unknown [3]. We report a case ascending colon cancer with multiple hepatic and splenic lesions, and para-aortic lymph nodules, and she was diagnosed sarcoidosis. The hepatic and splenic lesions, and para-aortic lymph nodules could not be distinguished metastases of colon cancer or sarcoidosis in imaging study. Therefore, resection of one of hepatic lesions, splenectomy, and resection of para-aortic swelling lymph node were performed, with intraoperative pathological examination, at the same time

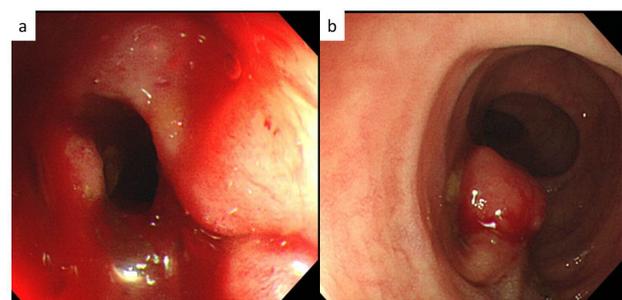
the primary colon cancer resection. Intraoperative pathological examination revealed hepatic and splenic lesions, and para-aortic lymph node were sarcoidosis not metastases of colon cancer.

### Case Presentation

A 62-year-old Japanese female with hypertension and diabetes mellitus was pointed out of splenic hypoechoic lesions in abdominal ultrasound examination of a periodical medical check-up. For further evaluation of splenic lesions, enhanced Computed Tomography (CT) was performed. It showed the thickened wall of ascending colon, multiple hepatic lesions, multiple splenic lesions, and lymphadenopathy around the ascending colon, abdominal aorta, mediastinum and pulmonary hilar (Figure 1). Colonoscopy showed a circumferential tumor in ascending colon and, a polyp which is 30mm in diameter in sigmoid colon (Figure 2). Biopsy was performed, and the ascending colon tumor and sigmoid colon polyp were diagnosed as well differentiated adenocarcinoma respectively. The serum Carcinoembryonic Antigen (CEA) was elevated (10.5ng/ml).



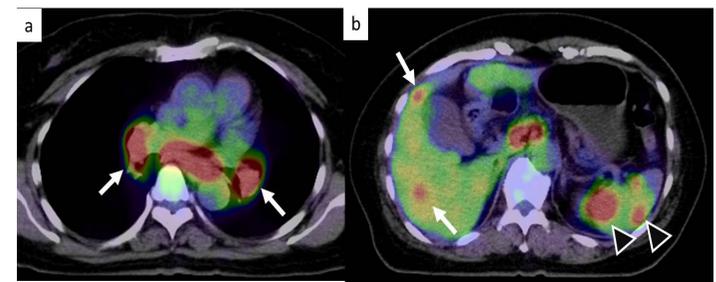
**Figure 1:** Enhanced CT findings. Multiple liver lesions (arrows), multiple splenic lesions (arrow heads).



**Figure 2:** Colonoscopy findings. a) A circumferential tumor in ascending

colon. b) A polyp which is 30mm in diameter in sigmoid colon.

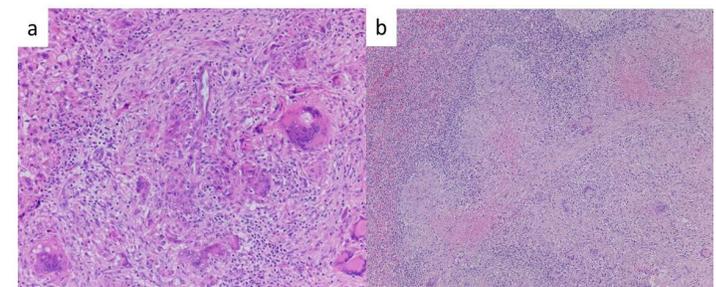
Positron-Emission Tomography (PET)-CT showed high Fluoro Deoxy Glucose (FDG)-uptake in ascending colon (Standardized Uptake Value max (SUV max): 28.4), sigmoid colon (SUV max: 27.1), hepatic lesions (SUV max: 5.8), splenic lesions (SUV max: 16.8), and the mediastinal, hilar, para-aortic lymph node (SUV max: 17.7) (Figure 3). Endoscopic Ultrasound Fine Needle Aspiration (EUS-FNA) biopsy of mediastinal lymph node was performed, and microscopically non-caseating epithelioid cell granulomas with multi-nuclear giant cells were recognized, and it diagnosed as sarcoidosis. She was diagnosed as advanced ascending colon cancer, early sigmoid colon cancer, and sarcoidosis. But hepatic and splenic lesions, and para-aortic lymph nodules could not be diagnosed as metastases of ascending colon cancer or sarcoidosis.



**Figure 3:** PET-CT findings. a) High FDG-uptake in the mediastinal, hilar, para-aortic lymph node (arrows). b) High FDG-uptake in hepatic lesions (arrows) and splenic lesions (arrow heads).

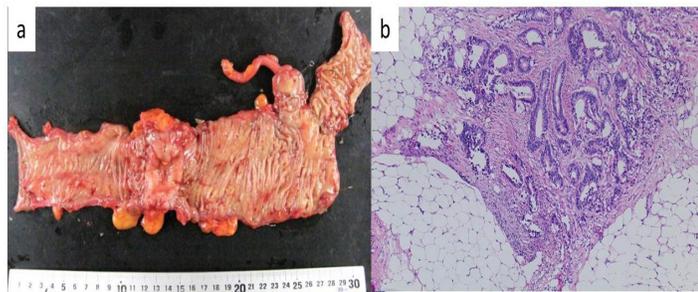
Operations were right hemicolectomy with D3 lymph node dissection, sigmoid colectomy with D2 lymph node dissection, and resection of one of hepatic lesions, splenectomy, and resection of para-aortic swelling lymph node.

Intraoperative pathological examination revealed hepatic and splenic lesions, and para-aortic lymph node were sarcoidosis not metastases of colon cancer (Figure 4). Therefore, we assessed the radical excision was performed. The postoperative course was uneventful, and she was discharged on the 14th postoperative day.



**Figure 4:** Histopathological examination of hepatic lesions(a), and splenic lesions(b): Non-caseating epithelioid cell granulomas with multi-nuclear giant cells were recognized. They were diagnosed as sarcoidosis.

Final diagnosis was ascending colon cancer (tub2, T4a, N1a, M0 StageIIIB in UICC TNM staging) (Figure 5), sigmoid colon cancer (tub1, Tis, N0, M0 Stage0 in UICC TNM staging), and sarcoidosis. She received adjuvant chemotherapy with capecitabine for 6months. The serum CEA level normalized after operation, and has continued to be within the normal range. Periodical evaluation with enhanced CT and colonoscopy showed no recurrence of colon cancer, and sarcoidosis didn't getting worse without any treatment in postoperative 1year and 4months.



**Figure 5:** a) Macroscopic findings of the resected right hemicolon: Type 2 tumor about 47×39mm in diameter in ascending colon. b) Histopathological examination of ascending colon tumor: Well differentiated adenocarcinoma.

## Discussion

Sarcoidosis is a multisystem disease characterized by the presence of non-caseating granulomas in affected organs. Pulmonary involvement is the most common site of disease activity. However, abdominal organs are frequently involved in sarcoidosis [4]. Liver and spleen are the most frequently, but usually patients have no symptoms related to liver or splenic sarcoidosis [5]. Two autopsy series reported the liver and spleen involvement is seen in 40-60% of sarcoidosis patients [6,7]. The most common radiographic finding of hepatic sarcoidosis is hepatomegaly. Focal nodules are also noted in the hepatic sarcoidosis patients. On enhanced CT, liver nodules appear as hypodense masses relative to adjacent normal liver, and peripheral enhancement typically is not seen. On Magnetic Resonance Imaging (MRI), the lesions are hypointense on all sequences and hypoenhancing relative to the background liver [5].

In sarcoidosis patients, splenomegaly is seen in 25-60%, and splenic nodules are seen in 6-33% [5, 8-10]. On enhanced CT, the splenic nodules are hypodense relative to adjacent normal spleen, and peripheral enhancement is not seen. On MRI, the lesions are also hypointense on all sequences [5]. PET-CT provides valuable information to uncover an occult diagnostic site or multiple organ involvement in sarcoidosis [11]. However, PET-CT is not very specific because of the uptake pattern in sarcoidosis can mimic malignancy or lymphoma disease [12]. Therefore, it is difficult to diagnose hepatic and splenic lesions as sarcoidosis or metastases

of colorectal cancers with only imaging study, and tissue section by biopsy or resection for pathological examination are needed.

With a recent development of chemotherapy, the survival period of the colorectal cancer patients with distant metastasis has been improved. However, it has not yet satisfactory. If the primary tumor is possible to be resectable with the spontaneous distant metastasis, curative resection of the primary tumor is performed, and resection of the distant metastasis is considered [13]. In this case, local resection for prevention of bowel obstruction was required, therefore the simultaneous resection of one of hepatic lesions, splenectomy, and resection of swelling para-aortic lymph node were chosen. If preventive surgery for bowel obstruction was not required and para-aortic lymph node was not swelling, percutaneous biopsy of hepatic and splenic lesion could be acceptable. And if the hepatic and splenic lesions are metastases of colon cancer, chemotherapy may be appropriate.

The metastases to mediastinum or lung hilar lymph nodes suggests poor prognosis and difficulty of radical therapy in colon cancers. If the mediastinum and lung hilar lymph nodes swelling due to benign disease as sarcoidosis, the management of colon cancers should be altered. In this case, sarcoidosis was diagnosed in preoperative period and, we could perform radical operation with intraoperative pathological examination of hepatic, splenic nodules and para-aortic lymph node. This case suggests that it is difficult to distinguish hepatic and splenic sarcoidosis from metastatic disease of colorectal cancer even using the latest modalities.

## Conclusions

The differential diagnosis between the hepatic and splenic sarcoidosis and the hepatic and splenic metastases of colorectal cancer with only imaging study is very difficult. The lesions of liver or spleen are revealed in colorectal cancer patient, and if imaging inspection is not typical of metastases of colorectal cancers, sarcoidosis should be considered as a differential diagnosis.

## Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

## Competing Interests

KYO has received honoraria for lectures from Chugai Pharmaceutical Co., Ltd., Taiho Pharmaceutical Co., Ltd., Takeda Pharmaceutical Co., Ltd., Eli Lilly and Company, Daiichi Sankyo Co., Ltd., Ono Pharmaceutical Co., Ltd., Merck Serono Co., Ltd., Novartis Pharma K.K. and Sanofi K.K., and research funding from Ajinomoto Pharmaceutical Co., Ltd., Takeda Pharmaceutical Co., Ltd., Chugai Pharmaceutical Co., Ltd., Daiichi Sankyo Co., Ltd.,

Taiho Pharmaceutical Co., Ono Pharmaceutical Co., and Yakult Honsha Co., Ltd., outside the submitted work. TaT has received honoraria for lectures from Takeda Pharmaceutical Co., Ltd. All remaining authors declare that they have no conflicts of interest.

## Authors' Contributions

KM, NM, and TaT participated in the conception and design of this case report. KM, NM and KYo drafted and revised the manuscript. All authors read and approved the final manuscript.

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