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Asymptomatic Spleen Metastatic of Colorectal Cancer: A Case Report

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ABSTRACT

Isolated splenic metastasis from colorectal cancer (CRC) is extremely rare, occurring in only 1.2–7.1% of cases, due to the spleen's strong immune surveillance, lack of afferent lymphatic drainage, and unique blood flow. While metastasis typically spreads to the liver and lungs, haematogenous dissemination to the spleen can occur, though the exact mechanism remains unclear. Most cases are asymptomatic and discovered incidentally through imaging or rising carcinoembryonic antigen (CEA) levels. Treatment options include systemic chemotherapy, splenectomy, or a combination, depending on disease extent and patient condition. This study reports two cases of sigmoid colon adenocarcinoma initially treated with curative surgery and six months of FOLFOX chemotherapy. Both patients showed no initial metastasis but later presented with rising CEA levels (140 ng/mL). CT scans revealed isolated splenic metastases without other systemic involvement. They underwent an additional six months of chemotherapy, achieving stable disease with no complications. These cases highlight the importance of close surveillance and suggest that systemic chemotherapy alone may be a viable alternative to splenectomy in selected patients.

Keywords: Spleen, Metastasis, Colorectal Cancer, Asymptomatic, Chemotherapy

1. Introduction

Colorectal cancer (CRC) is one of the most prevalent malignancies worldwide, ranking among the leading causes of cancer-related mortality. The disease frequently metastasises to the liver, lungs, peritoneum, and lymph nodes, with haematogenous and lymphatic spread being the primary mechanisms of dissemination. However, isolated splenic metastasis from CRC is exceedingly rare, with only a few cases reported in the literature. The spleen is considered an unfavourable organ for metastatic colonisation due to its anatomical and physiological characteristics, including its strong immune surveillance, rhythmic contraction, and lack of afferent lymphatic supply (1).

Although splenic metastases have been documented in advanced or widely disseminated malignancies, their presence as an isolated and asymptomatic finding in a patient who has undergone curative resection and adjuvant therapy remains uncommon. Most cases of splenic metastases from CRC are diagnosed incidentally during follow-up imaging or post-mortem examinations (2). This raises important questions regarding disease progression, surveillance strategies, and the potential need for surgical intervention in selected cases.

Here, we present a rare case of an asymptomatic patient with isolated splenic metastasis from colorectal cancer, discovered incidentally after adjuvant treatment for a previously resected primary tumour. This case underscores the importance of continuous oncological follow-up and highlights the necessity of considering uncommon metastatic sites in CRC patients. Furthermore, we discuss the possible pathophysiological mechanisms, diagnostic challenges, and management strategies associated with splenic metastases.

2. Case Presentation

We present two rare cases of respectable sigmoid colon adenocarcinoma with lymph node involvement, initially managed with conventional laparotomy resection, primary anastomosis, and six months of adjuvant chemotherapy using the standard FOLFOX regimen (5-fluorouracil, leucovorin, and oxaliplatin). Preoperative imaging revealed no evidence of distant metastasis, and both patients recovered well postoperatively without immediate complications. Throughout the adjuvant chemotherapy period, they remained clinically stable, with no symptoms suggestive of recurrent disease. However, during routine follow-up, a progressive rise in serum carcinoembryonic antigen (CEA) levels was detected, reaching 140 ng/mL. Despite this biochemical recurrence, neither patient exhibited any clinical signs of metastasis, prompting further radiological evaluation. A follow-up abdominal CT scan identified a hypodense solid mass in the spleen, highly suggestive of metastatic disease (Figure 1). Notably, no additional metastatic lesions were found in the liver, lungs, or peritoneum, which are the more typical sites of colorectal cancer spread. Given the rarity of isolated splenic metastasis and the absence of other systemic involvement, these cases presented a unique diagnostic and therapeutic challenge.

With a multidisciplinary team approach, both patients were started on an additional six-month course of systemic chemotherapy, which they tolerated well without significant adverse effects or disease progression. Regular follow-ups, including imaging and biochemical monitoring, demonstrated favourable clinical outcomes, with stable or declining CEA levels and no new metastatic progression. Both patients remained asymptomatic, with no evidence of splenic rupture, infarction, or other complications related to the metastatic lesion. These cases highlight the critical role of CEA surveillance in detecting occult metastatic disease and emphasize the need for thorough imaging in cases of unexplained CEA elevation. While splenic metastases from colorectal cancer are extremely rare due to the spleen's immune microenvironment and lack of afferent lymphatic drainage, their occurrence underscores the importance of maintaining a high index of suspicion in atypical cases. The successful management of these patients with systemic chemotherapy further suggests that non-surgical treatment can be a viable approach in select cases, particularly when the disease burden remains limited and patients are clinically stable. These findings contribute to the growing understanding of rare metastatic patterns in colorectal cancer and highlight the need for individualised, evidence-based treatment strategies to optimise patient outcomes.

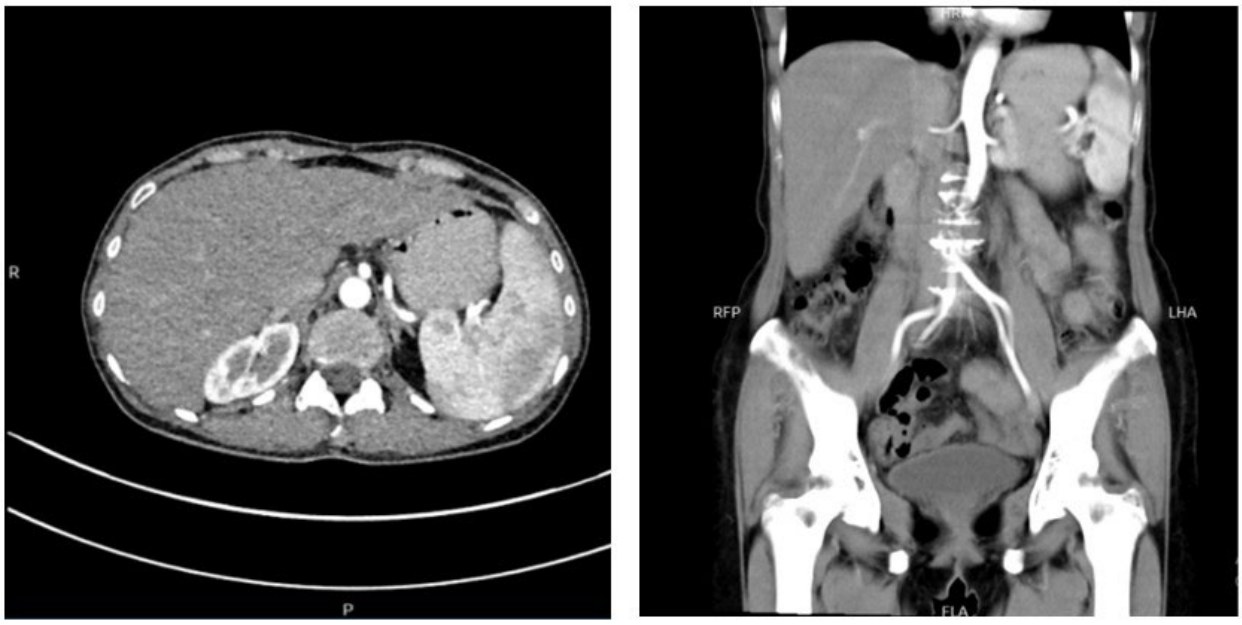

Figure 1. [A. Axial view, B. Coronal view]. Computerized Tomography [CT] Scan of the abdomen showing the hypodense solid mass in the spleen, the largest measuring 1.6 cm. (**Designed by Authors, 2025**).

3. Discussions

This case highlights a rare occurrence of isolated splenic metastasis from a colorectal primary tumour. Both primary and metastatic tumours of the spleen are extremely uncommon due to the organ's lymphoid tissue composition **(3)**. The patient responded well to surgical resection and adjuvant chemotherapy using the standard FOLFOX regimen for six months, though long-term outcomes remain uncertain. The spleen is rarely a site for metastasis of solid malignant tumours due to its unique anatomy and microenvironment, though some studies have reported unexpected cases of splenic metastasis in controlled conditions, including one where splenic metastasis appeared years after treatment **(4, 5)**. Isolated splenic metastasis from colorectal cancer is exceptionally rare, accounting for less than 0.2% of resected cases **(6)**. A review published in 2001 found that among 50

splenectomy cases, only 11% were of colorectal origin (7).

Metastatic tumour formation is a complex process influenced by anatomical, mechanical, immunological, and tumour-intrinsic factors. Compared to the lungs, liver, and kidneys, metastases to the spleen are rare due to its unique anatomy and immune surveillance (8). Splenic metastasis primarily occurs via haematogenous spread, as the spleen lacks afferent lymphatic vessels (3). Some researchers suggest retrograde haematogenous spread through the inferior mesenteric vein, though this is rare due to normal blood flow direction. Additionally, the spleen's sharp arterial angles, rhythmic capsule contraction, and reticuloendothelial system limit tumour implantation and growth (3, 8). Splenic cells may also possess antitumor properties, inhibiting micro metastases. While clinically detected isolated splenic metastases are reported in 4.4% of colon cancer and 1.6% of rectal cancer cases, autopsy studies suggest an incidence of 7.1% (9, 10). Factors restricting splenic metastasis include high blood flow, lack of afferent lymphatics, limited intrasplenic lymphatic vessels, and strong immune surveillance (11).

The high incidence of liver, lung, and lymph node metastases in colorectal cancer is likely due to its spread through lymphatic and vascular systems (12). One hypothesis suggests that splenic metastases are rare because cancer cells accumulate in the spleen, receive pro-apoptotic signals, and fail to survive. Despite being highly vascularised, the spleen remains an uncommon site for metastasis, with no definitive explanation (13). Research on the secreted protein Dickkopf-2 found it crucial for generating cancer cells with high metastatic potential. The study demonstrated that knockout of protein Dickkopf-2 in CRC cells led to a significant reduction in liver metastases, suggesting that protein Dickkopf-2 may facilitate the metastatic process. While the study primarily focused on liver metastasis, the mechanisms involving protein Dickkopf-2 could potentially be relevant to splenic metastasis as well (14).

Splenic metastases from colorectal cancer are typically diagnosed through imaging studies during postoperative follow-ups, often prompted by rising CEA levels (11). Most splenic abnormalities have distinct imaging patterns, making biopsy or invasive procedures rarely necessary. Abdominal ultrasound, CT scans, and MRI are the gold standard for diagnosis, with contrast administration aiding differentiation from haemorrhage or other abnormalities (9). On CT, splenic metastases appear as well-defined, low-attenuation cystic or solid masses, sometimes showing peripheral or septal enhancement. Calcification is rare, except in mucinous adenocarcinomas (15).

Since most cases (83.5%) are asymptomatic, metastases are often discovered incidentally during routine imaging (11). However, some patients may experience upper abdominal pain, weight loss, or splenomegaly (16). In rare cases, splenic metastasis can lead to life-threatening complications such as spontaneous rupture, portal vein thrombosis, or abscess formation (11). An elevated CEA level was present in 82.5% of cases, prompting further imaging. In this study, CT scans were the primary diagnostic tool (86.5%), followed by PET-CT (29.7%). Notably, two patients were first diagnosed with splenic metastases during splenectomy, leading to a subsequent colorectal cancer diagnosis (17).

The primary treatment for isolated splenic metastasis from colorectal cancer is splenectomy, often followed by chemotherapy. Surgery offers the best chance for a cure, with low morbidity and potential long-term survival (10). Laparoscopic splenectomy is becoming a standard approach due to its minimally invasive nature. If untreated, splenic metastases may lead to rupture (11).

In patients unfit for immediate surgery, systemic chemotherapy (e.g., XELOX) followed by delayed surgery has been successful (10). Alternative treatments like thermal ablation (radiofrequency or microwave) have been explored for non-surgical candidates, preserving spleen function with low morbidity, though long-term efficacy remains uncertain (18). Limited data suggest post-splenectomy survival ranges from 3 to 84 months, with a mean of 22.5 months. The present case remains disease-free at twelve-month follow-up (16).

4. Conclusion

Although it was a rare clinical finding following adjuvant chemotherapy, splenic metastasis arising from colorectal cancer could be managed by close follow-up and chemotherapy for asymptomatic patients.

5. Declarations

5.1 Acknowledgments

No potential conflict of interest relevant to this article was reported.

5.2 Ethical Considerations

This case study has already been approved by Health Research Ethic Committee of Moewardi General Hospital, Surakarta, Indonesia (Ethical clearance number: 17/ IV/HREC/2025).

5.3 Authors' Contributions

Budhi Ida Bagus has contribution on conception, design, interpretation of data and responsible for the content of this manuscript.

5.4 Conflict of Interest

There is no conflict of interest to be declared.

5.5 Fund or Financial Support

This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

5.6 Using Artificial Intelligence Tools (AI Tools)

During the preparation of this manuscript, the author did not used AI tools to improve the clarity of this manuscript. The authors reviewed and edited the text and take full responsibility for the final content.

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