Ascending Colon Cancer with Sternal Bone Metastasis: A Rare Case Report

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Abstract

Colorectal cancer (CRC) remains a significant global health burden, ranking among the top causes of cancer-related mortality worldwide. Colon cancer metastases most frequently occur in the liver, brain, and lung, and a rare metastasis to a bone. This report presents a rare example of mediastinal lymph node-based colon cancer with significant metastases.

Here we present a 68-year-old male a known case of HTN and leukemia in 2018, which was cured with chemotherapy, was admitted to the hospital complaining of constipation for 2 months, not associated with vomiting, distention, hematochezia, or weight loss. A lower endoscopy revealed a fungated, circumferential mass in the ascending colon with significant luminal narrowing. Biopsies were consistent with the diagnosis of invasive, moderately to poorly differentiated adenocarcinoma in the ascending colon. In addition to tubule-villous adenoma in the sigmoid. Computed tomography (CT) scans of the chest, abdomen, and pelvis were performed preoperatively as part of routine staging for colon cancer. No liver or lung pathology was identified; however, a pathological CT scan showed a right-sided soft tissue mass destroying the manubrium, and the first rib was observed. A sternum core biopsy indicates metastatic carcinoma, consistent with the primary colorectal tumor. The management is based on radiotherapy for the sternal mass to prevent a complication.

The patient, in this case, presented with colorectal adenocarcinoma, and during the investigation, the CT scans of the chest, abdomen, and pelvis revealed no evidence of liver or lung metastasis, typical sites for colon cancer spread. However, an incidental finding of a right-sided soft tissue mass involving the manubrium and the first rib was observed on a CT scan, prompting further investigation. Accordingly, the patient was diagnosed with colorectal cancer metastasis to the sternum.

This case serves as the importance of considering the sternum as a potential metastatic site in CRC, facilitating prompt intervention to mitigate adverse effects and enhance survival rates.

1. Introduction

Colorectal cancer is a common malignancy, and metastasis to distant sites can significantly impact patient prognosis. While bone metastases are relatively rare in colorectal cancer, they can present with varied clinical manifestations.[1] We present a rare case of ascending colon cancer with sternal bone metastasis in a 68-year-old male patient.

Colonic adenocarcinoma typically metastasizes to regional lymph nodes, liver, and lungs, with bone metastases occurring infrequently. Sternal involvement as a site of metastasis from colorectal cancer is particularly rare and poses diagnostic and therapeutic challenges [1].

Here, we describe the clinical presentation, diagnostic evaluation, and management of this unique case, highlighting the importance of considering distant metastases in patients with colorectal cancer.

This case underscores the need for a multidisciplinary approach to optimize patient care and improve outcomes.

2. Case Presentation

A 68-year-old male heavy smoker was admitted to the hospital complaining of constipation for two months duration, which gradually increased in intensity without vomiting, distention, hematochezia, or weight loss. During the examination, the patient appeared oriented and conscious, the abdomen was lax and soft, and on deep palpation tenderness was noticed. The patient had a medical history of AML in 2018, which was successfully treated with chemotherapy, and was recently diagnosed with HTN, surgical history is free plus no food or drug allergies.

For diagnosis laboratory testing done and showed no abnormality, CT scan, lower endoscopy, and biopsies were done, The most important findings were: irregular, ill-defined wall thickening involving the ascending colon, cecal valve, and ileocecal valve, associated with regional fat stranding and prominent lymph nodes up to 7 mm on CT scan , beside that Lower GI endoscopy reveal A circumferential and fungating mass with significant luminal narrowing in the ascending colon as we see in Figure 1 ,after biopsies were taken the pathology reports revealed invasive, moderately to poorly differentiated adenocarcinoma in the ascending colon, a tubulovillious adenoma with low-grade dysplasia of the sigmoid polyp that was removed plus , the mass largest dimension was 9 cm, lymph vascular invasion was present, on pathology cells are focally positive for CK7 and CK20 and weakly positive for synaptophysin , so colon cancer was diagnosed plus staging was completed and it was T3N1MX with no metastases.

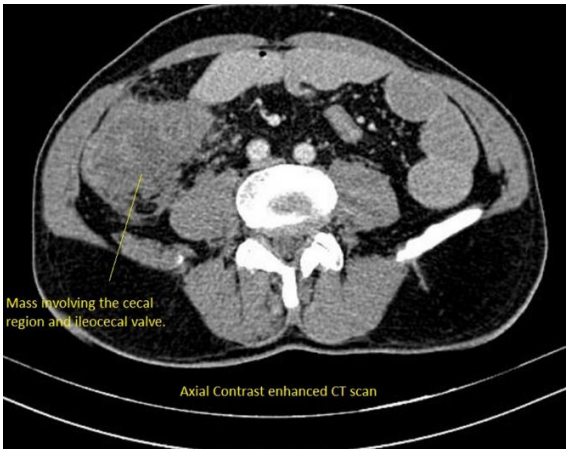
A surgical management was the choice of treatment, CBC, liver function, and serology tests were performed on the surgery day, results were all within the normal range, with the exception of CRP = 135.4 g/l and ca = 8.2 mg/dl, hemicolectomy with GBS resection performed with a side-to-side ilio-colic anastomosis, it worth to mention that hospital stay was uneventful and without complications.

The following month after the surgery tumor markers were done results showed CEA = 2.93 ng/ml, CA 15-3 = 24.6 u/ml, and CA19-9 = 2.40 u/ml all within normal range. Clinical chemistry results were also within normal ranges, with the exception of LDH = 136.3 U/L.

After 2 months the patient presented with a new complaint of anterior chest wall mass just below the substernal notch, Ultrasound was done revealing soft tissue echogenicity mass with multiple calcifications involving the right sternoclavicular region measuring 3.5*4 cm, so to differentiate between primary And secondary malignancy or severe sternoclavicular arthritis, CT of the neck, chest, abdomen with and without IV contrast was ordered, on neck CT with contrast the results were; A large right-sided 7*6 cm enhancing soft tissue formation, centered destroying the manubrium of the sternum and the first rib with internal calcification, it was noticed there is invasion of the anterior chest wall and the mediastinal fat, causing compression on the left brachiocephalic vein without thrombosis, it was mentioned in the report that there is few right-sided lower cervical/supraclavicular lymph node enlargement of 15*10mm .

CT-guided core biopsy was obtained to differentiate between primary or secondary malignancy revealing metastatic malignancy to the sternum.

The plan that was made is urgent radiotherapy on the sternal mass.



3. Discussion

Colon cancer, also known as CRC, is a prevalent type of cancer that can be prevented with proper screening. It is the third most commonly diagnosed cancer for both men and women in the United States, and it is the second deadliest cancer overall. Fortunately, the incidence and mortality rates of CRC have been decreasing in recent years, except for in adults under the age of 50. This may be due to the widespread use of screening methods in developed countries. While several non-invasive screening methods are available, colonoscopy is still considered the most reliable way to detect colon cancer. Both environmental and genetic factors can increase the risk of developing CRC. The accumulation of acquired or inherited mutations is necessary for the transformation of normal colon cells into precancerous lesions, which can eventually progress to invasive carcinoma [2,3].

The development of metastasis from CRC raises concerns for both patients and clinicians since metastasis may be fatal because it interferes and causes mass-effect with homeostasis. Early detection of CRC is vital since already metastasized cancer has adverse effects on survival. Given the extensive research advancements in metastasis research, our knowledge of metastasis cellularly and molecularly has significantly increased [4].

A large-scale nationwide modern autopsy study that measured the dissimilarity of metastatic patterns in well-known histological subtypes of CRC has involved a retrospective review of pathological and autopsy records from 5930 CRC patients diagnosed between 1991 and 2010, the findings revealed 1679 patients diagnosed with adenocarcinoma (AC), among AC patients, 73.0% metastasized to the liver, followed by metastases to peritoneal surfaces with a percentage of 20.1%. Other sites of metastasis included the lung (approximately one-third), and distal lymph nodes (19.9%) [5].

It is widely notable that CRC does not frequently metastasize to bone. Another study was conducted to establish the possibility of CRC bypassing other organs and metastasizing directly to bone. The study analysed 252 patients with CRC and the findings revealed that isolated bone metastasis in CRC patients is exceedingly rare, with no patients showing isolated osseous metastasis at the time of diagnosis, and none of them experienced isolated bone metastasis without the involvement of other organs. This underscores the uncommon occurrence of isolated bone metastasis in CRC patients compared with more typical sites such as the liver and lungs [6].

In cases where bone metastasis is confirmed, clinicians should keep in mind the possibility of other organs' involvement; typically bone metastasis in the context of primary colon cancer indicates an advanced stage of the disease and is rarely isolated [6]. In our case, the patient had bone metastases to the sternum with no involvement at other sites. Depending on what else is mentioned in the literature, our case suggests a rare yet potential path of metastasis.

Few case reports have been published showing colon cancer metastasis to the sternum. Some case reports documented sternal metastasis as the initial presentation, where the sternal mass led to the discovery of primary colon cancer [7-9]. Other case reports identified the primary colon cancer first and resected it; years later, they discovered the sternal metastasis after it caused patient complaints requiring investigation [10,11].

Our case report differs in the rapid metastasis of the adenocarcinoma to the sternum, detected just 2 months after hemicolectomy. In contrast, previous cases found sternal metastasis years after treating the primary colon cancer. For instance, sternal metastasis was found 6 and 8 years later in patients [10,11] respectively. This early diagnosis of sternal mass will improve survival, as it was found before any serious complaints. Additionally, the CT scan showed a right-sided soft tissue mass destroying the manubrium and first rib, an atypical location compared to previous cases that reported sternal masses in the lower ribs [8,10].

The sternal core biopsy excluded chondrosarcoma and confirmed metastatic carcinoma consistent with the primary colorectal tumor. We recommended urgent radiotherapy to the sternal mass to prevent further enlargement and compression of the left brachiocephalic vein or other structures. Radiotherapy was used for treatment as it is effective in treating sternal malignancies with minimal invasion [12].

This case demonstrates the importance of considering the sternum as a metastasis site in colon carcinoma. This will help reduce the consequences of discovering sternal metastasis at a later stage, improving patients' survival rates, and reducing the need for more invasive and costly procedures. The location of this sternal mass near the sternoclavicular joint and first rib could have caused worse outcomes from compressing the left brachiocephalic vein and other vital structures if not discovered and treated early.

4. Conclusion

In conclusion, we presented a rare case of ascending colon cancer with bone metastasis to the sternum. This case highlights the importance of considering distant metastases in patients with colorectal cancer, even when bone involvement is uncommon. The management of such cases requires a multidisciplinary approach, including surgery, chemotherapy, and radiation therapy, to optimize patient outcomes. Further research is needed to better understand the pathophysiology of bone metastasis in colorectal cancer and to identify effective treatment strategies for these patients.

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