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**An unusual initial presentation of colorectal cancer: abdominal wall and scrotal abscess associated with right ventricular metastasis**

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**Informed consent:** the patient provided consent for access to medical records at the time of admission.

### **Abstract**

A 56-year-old man presented to the emergency department with a painful abdominal lump with redness of the overlying skin in the right iliac fossa, swelling, and redness of the scrotum. Laboratory tests revealed a marked increase in white blood cell count ( $50.73 \times 10^9/L$ ), neutrophil count ( $48.18 \times 10^9/L$ ), and C-reactive protein levels (37.36 mg/dL). Abdominal contrast-enhanced Computed Tomography (CT) scan showed a voluminous neoplastic lesion involving the ascending colon, the cecum, and the last ileal loop, which was in communication with a large abscess located in the anterior abdominal wall and extended craniocaudal up to the right scrotum; a mass within the right ventricle was also seen. The patient underwent a right hemicolectomy and a right orchiectomy. Histological examination revealed a low-grade mucinous adenocarcinoma of the right colon as well as a significant abscess of the right testis' tunica vaginalis. The patient died one month after surgery.

### **Introduction**

Colorectal cancer is the third most common malignancy and the second most common deadly cancer worldwide as of 2020.<sup>1</sup> There are only a few case reports of abdominal wall involvement by colorectal cancer as the initial presentation.<sup>2-6</sup> Cardiac metastasis from colorectal cancer is very rare, accounting for 1.2% in the large autopsy series.<sup>7</sup>

## Case Report

A 56-year-old man presented to the emergency department with a painful abdominal lump with redness of the overlying skin in the right iliac fossa, swelling, and redness of the scrotum. His medical history was unremarkable. His vital signs were normal, except for blood pressure (150/80 mmHg). Laboratory tests revealed a marked increase in white blood cell count ( $50.73 \times 10^9/L$ ) with an equally marked increase in neutrophil count ( $48.18 \times 10^9/L$ ), microcytic anemia (hemoglobin 8.3 g/dL; mean corpuscular volume 58 fl), hyperplateletemia ( $699 \times 10^9/L$ ) with normal values of mean platelet volume, marked increase of lactate dehydrogenase (360 U/L) and C-reactive protein levels (37.36 mg/dL).

Abdominal contrast-enhanced Computed Tomography (CT) scan showed a voluminous neoplastic lesion involving the ascending colon, the cecum, and the last ileal loop (Figure 1A, Figure 2A,B). This lesion was perforated and in communication with a large abscess located between the ascending colon-cecum and the antero-lateral abdominal wall (Figure 1A, Figure 2B); this large abscess was in turn in communication with another abscess located in the anterior abdominal wall and extended cranio-caudally from the right iliac fossa to the right side of the scrotum (Figure 1A, Figure 2A). Finally, a CT scan showed some voluminous liver metastases (Figure 2A,B), an inflammatory consolidation in the middle lobe (Figure 1B), and, most of all, a mass within the right ventricle with pericardial effusion (Figure 1B). Transthoracic echocardiography revealed a non-floating mass within the right ventricle; taking into account the imaging characteristics, this lesion was highly suspicious for metastasis.

To achieve a complete removal of the source of sepsis, the patient underwent a right hemicolectomy with a drainage of the abscesses in the abdominal cavity and in the abdominal anterior wall. In consideration of the absence of diffuse peritonitis, the adequate vascularization of the intestinal stumps, and the hemodynamic stability, an isoperistaltic latero-lateral ileo-colic anastomosis was performed. An open surgical approach was preferred because of the large abscess that affected the anterior abdominal wall; the abdominal surgical wound was treated with vacuum-assisted closure

therapy. To remove the last source of sepsis, a right orchiectomy was finally performed: in fact, the right scrotal incision revealed the presence of abundant purulent material with extended inflammation of the tunica vaginalis of the right testis (while the left scrotal incision did not show phlogosis).

Histological examination revealed a low-grade mucinous adenocarcinoma of the right colon and a marked abscessualization of the tunica vaginalis of the right testis.

One month after surgery, the patient developed cardiopulmonary arrest due to ventricular fibrillation (probably caused by the right ventricular metastasis) and died despite resuscitation attempts.

## **Discussion**

Colorectal cancer is the third most common malignancy and the second most common deadly cancer worldwide as of 2020.<sup>1</sup> There are only a few case reports of abdominal wall involvement by colorectal cancer as the initial presentation.<sup>2-6</sup> White *et al.*<sup>8</sup> reviewed 16000 colon cancer patients at Massachusetts General Hospital between 1938 and 1970, out of which only 9 had a presenting complaint of abdominal wall abscess. Perforation of the colon, fistula formation between the colon and adjacent structures, or direct tumor invasion can result in the formation of an abscess.<sup>9</sup> The most common location for abscess formation is the peritoneal cavity, including the paracolic space and the pelvic cavity; however, fistula formation or inflammation that spreads along the tissue planes may lead to abscesses in unusual locations such as the retroperitoneum, the abdominal wall, the perirectal space, the psoas muscle, and the thigh.<sup>9</sup> It has been reported that for colon cancer patients who present with an abdominal wall abscess, many cases were a mucinous carcinoma, and this is thought to be due to the tumor characteristics: in fact, mucinous carcinomas have a tendency to grow slowly and to spread by direct extension.<sup>9</sup> CT scan is the imaging modality of choice to make the diagnosis and to plan for surgery.<sup>3,9</sup> *En bloc* resection of colorectal cancer and of the full thickness of the abdominal wall (including the abscess) is the treatment of choice in the majority of such cases.<sup>3,6</sup> If surgery is contraindicated by the patient's general conditions, percutaneous aspiration and drainage by indwelling catheter combined with broad-spectrum antibiotics may be applied.<sup>6</sup>

Cardiac metastasis of noncardiac malignant tumors occurs in about 10% of cases; of these, only 10% are clinically symptomatic.<sup>10</sup> Cardiac metastasis from colorectal cancer is very rare, accounting for 1.2% in the large autopsy series.<sup>7</sup> The cardiac metastasis mechanism is thought to be as follows: direct extension, hematogenous spread, and lymphatic spread.<sup>7</sup> About two-thirds of heart metastases are associated with the pericardium (69.4%), one-third with the epicardium (34.2%) or myocardium (31.8%), and only 5% with the endocardium.<sup>7</sup> Radiologic investigations and echocardiography might be helpful in the differential diagnosis of cardiac mass.<sup>11</sup> Currently, there are no standardized approaches to treatment in patients with cardiac metastases from colorectal cancer, and further investigations are needed.<sup>11</sup> Surgical resection has been proposed, but it has high complications and mortality rates, while cardiac metastasis has a high postoperative recurrence rate.<sup>12</sup> Chemotherapy results in varying therapeutic responses.<sup>11</sup>

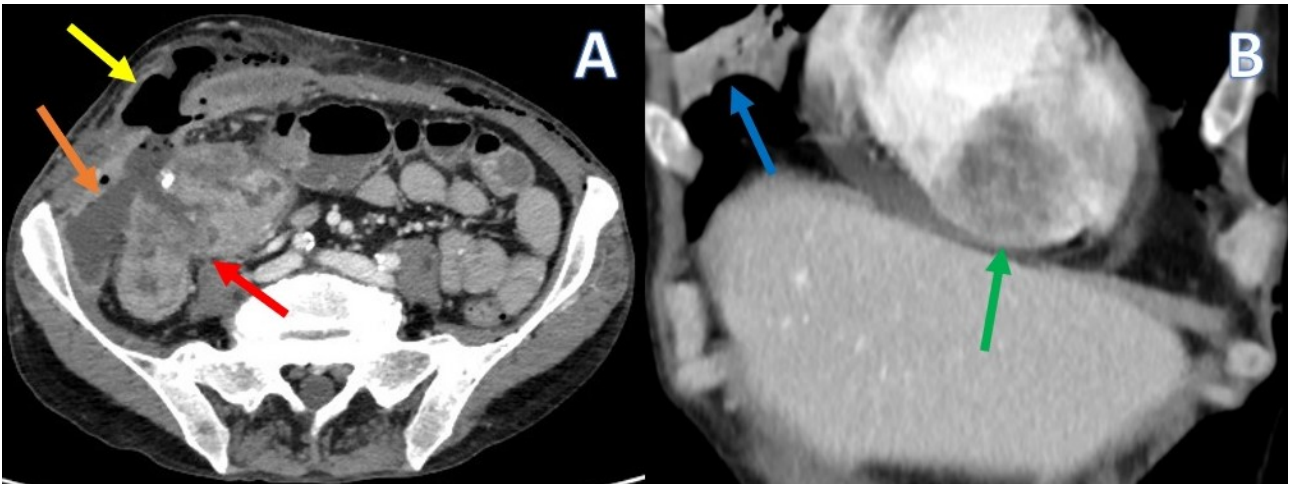
## **Conclusions**

In conclusion, emergency physicians should know these rare complications of colorectal cancer in order to allow appropriate diagnostic and treatment strategies (especially in patients presenting with sepsis, such as in this case).

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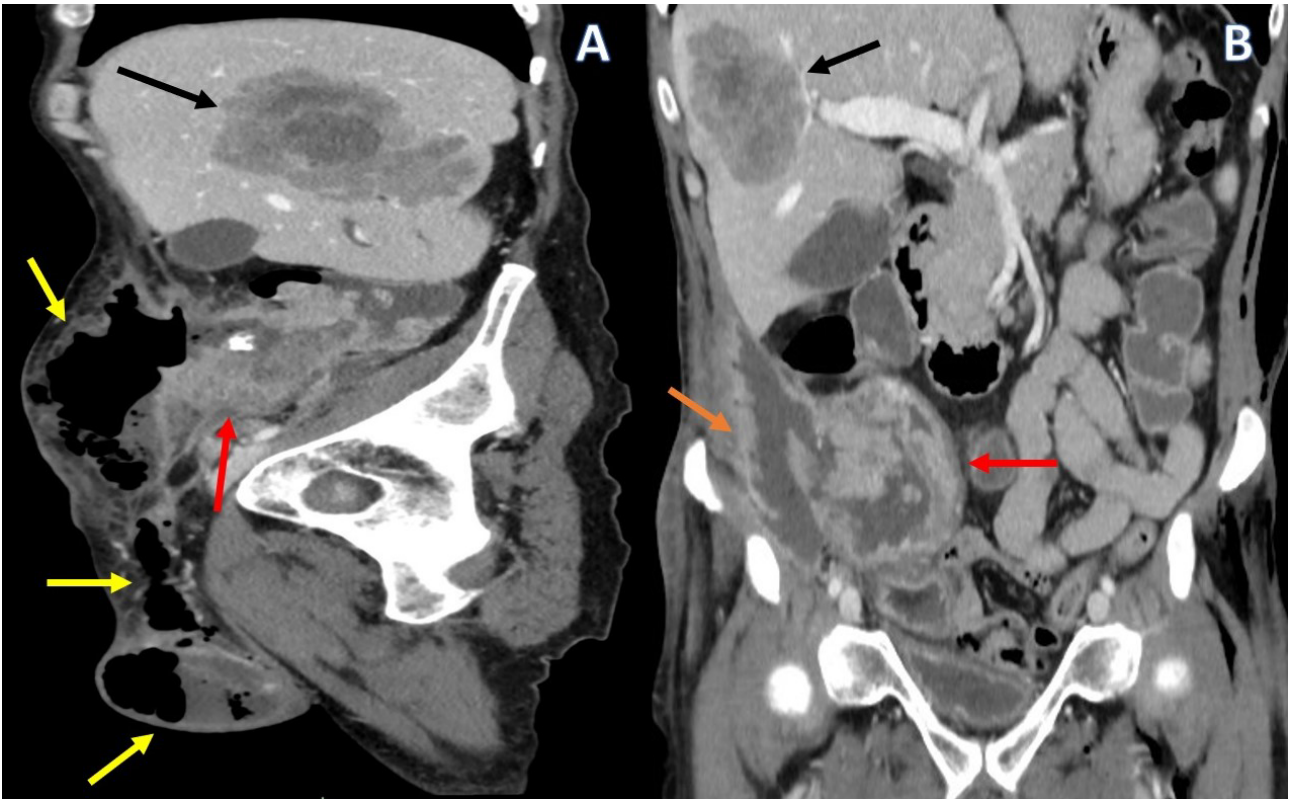
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**Figure 1.** Axial (A) and coronal (B) abdominal contrast-enhanced CT scan showing a voluminous neoplastic lesion involving the ascending colon, the cecum, and the last ileal loop (red arrow), which is in communication with an abscess located between the ascending colon-cecum and the anterolateral abdominal wall (orange arrow), which is in turn in communication with another abscess located in the anterior abdominal wall (yellow arrow). An inflammatory consolidation in the middle lobe (blue arrow) and a mass within the right ventricle (green arrow) are also shown.





**Figure 2.** Sagittal (A) and coronal (B) abdominal contrast-enhanced CT scan showing a voluminous neoplastic lesion involving the ascending colon, the cecum, and the last ileal loop (red arrow), which is in communication with an abscess located between the ascending colon-cecum and the antero-lateral abdominal wall (orange arrow), which is in turn in communication with another abscess located in the anterior abdominal wall extending up to the right scrotum (yellow arrows). Voluminous liver metastases are also shown (black arrow).

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