



# Destructive soft tissue metastases in advanced colorectal cancer: a case report

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**Abstract:** Extremity soft tissue metastases are a rare, but recognised complication of advanced colon cancer. There is limited data regarding their management, and such metastases are associated with a poor prognosis. The investigation of such metastases may require full-body positron emission tomography (PET) scanning, rather than per-protocol PET scanning. We present the case of a 76-year-old incarcerated male with a history of T4b N1b M0 right colon adenocarcinoma, who presented with right distal thigh pain and gross disfigurement. MRI demonstrated an erosive, verrucous soft tissue lesion, which had not been present on the diagnostic, per-protocol PET scan. Whole-body PET scan subsequently confirmed a highly avid lesion, with biopsy confirming metastatic adenocarcinoma consistent with colonic origin. The patient's pain was treated with multimodal analgesia and radiotherapy. Despite these interventions, locoregional symptoms from the extremity metastasis were difficult to control. The patient died 4 months following the diagnosis of metastatic disease. This case highlights the importance of recognising extremity soft tissue abnormalities as a possible consequence of advanced colon cancer. It illustrates the importance of whole-body PET scanning and explores management complexities that may present when caring for incarcerated patients. The subsequent literature review explores the existing literature regarding extremity soft tissue metastases in colon cancer. Further data regarding both the incidence and optimal management of such lesions is required.

**Keywords:** Colon cancer; nuclear medicine; positron emission tomography (PET); case report

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## Introduction

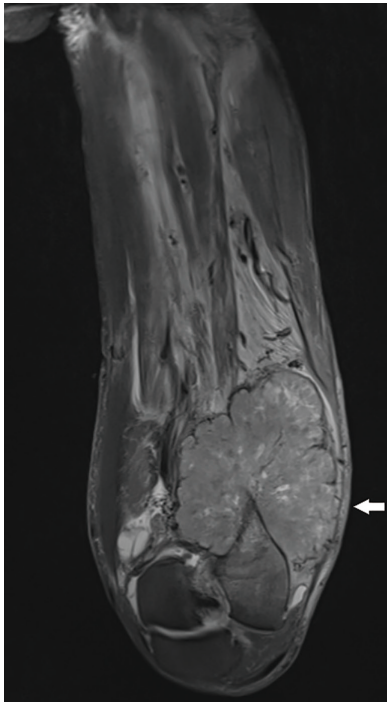
In 2018, colorectal cancer (CRC) was both the fourth most commonly diagnosed cancer, and the third most deadly cancer in the world (1). Alongside an increasing global incidence, multimodal management of this condition has improved outcomes (2). As a result of these epidemiological shifts and therapeutic advances, the prevalence of colorectal cancer has increased, and clinicians of all disciplines require an understanding of this multifaceted malignancy.

Soft tissue metastases from colorectal cancer are a rare

occurrence. Acrometastases, defined as metastases located distal to the elbow and knee (3), account for approximately 0.1% of all metastases, with metastatic colorectal carcinoma accounting for 10% of these cases (4). The prevalence of proximal extremity soft tissue metastases in colon cancer is not known. Furthermore, the optimal management and prognosis of such patients is not known.

Here, we present the case of a 76-year-old incarcerated male, who presented to hospital with a tender and grossly disfigured distal right thigh on a background of stage III

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**Figure 1** MRI of the distal thigh, demonstrating a verrucous, heterogenous soft tissue lesion invading locoregional structures including the femur. MRI, magnetic resonance imaging.

colorectal cancer. This case highlights both the complexity of caring for individuals within corrective services, and the importance of performing full body, rather than limited, positron emission tomography (PET) scanning in individuals suspected of advanced cancer. It also illustrates the complexities inherent in the management of extremity soft tissue metastases. We present the following article in accordance with the CARE reporting checklist (available at <https://apm.amegroups.com/article/view/10.21037/apm-21-362/rc>).

### Case presentation

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal. The 76-year-old male had a history of systemic lupus erythematosus, uncomplicated common variable

immunodeficiency and biventricular heart failure. Six months prior to presentation, while incarcerated, he had presented to another hospital with fatigue, and iron deficiency anaemia was detected. Colonoscopy demonstrated a 9 cm ascending colonic lesion, biopsy of which confirmed adenocarcinoma. Pre-operative CT staging demonstrated no metastatic disease. A preoperative PET scan, which examined the head, neck, chest, abdomen and pelvis, as per institutional policy, was negative for metastatic disease.

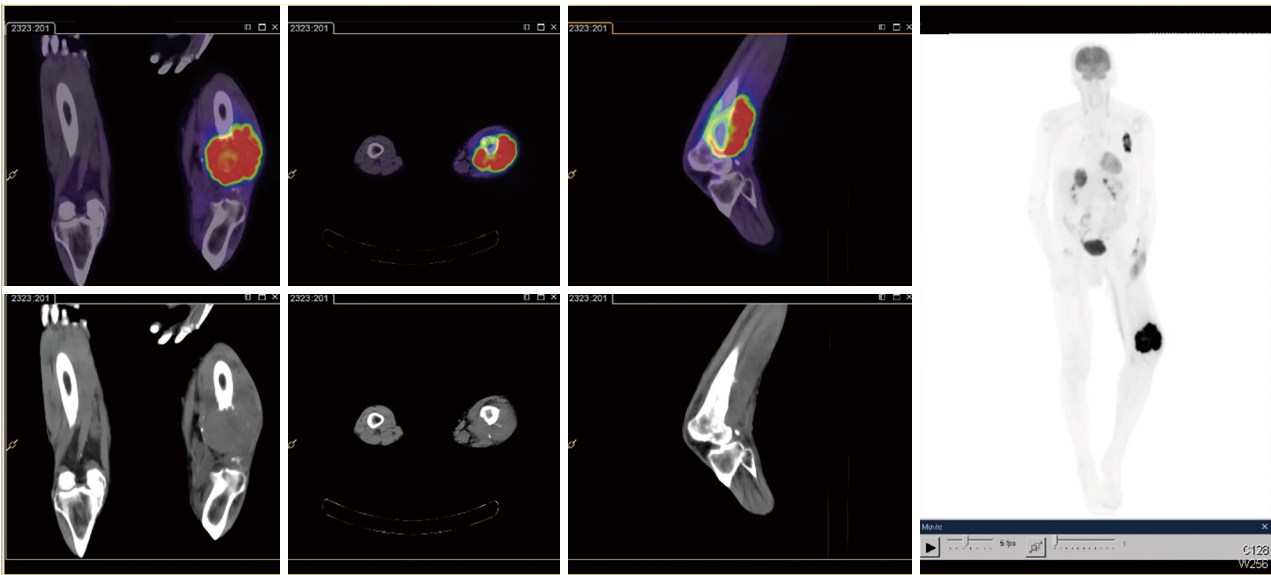
The patient subsequently underwent an uncomplicated right hemicolectomy, with pathology demonstrating a 120 mm moderately differentiated adenocarcinoma, with 2 of 14 nodes involved, indicating T4b N1b M0 disease. Immunohistochemistry demonstrated loss of MLH1 and the presence of a BRAF V600E mutation. Adjuvant chemotherapy or enrolment in a clinical trial were recommended by the multidisciplinary team. The patient was subsequently transferred to a different correctional facility, and follow-up with the medical oncology service was not undertaken. He presented to our service 4 months following surgery.

On presentation, the patient described moderate to severe pain originating from a mass on the distal anterolateral right thigh. Though the mass had been present for only two months, the patient did provide a history of worsening mobility and pain over the preceding six months (commencing prior to surgery for his colon cancer).

On examination, the patient appeared cachectic and unwell. A 100×80 mm tender mass was noted on the anterolateral distal thigh, with marked dilatation of the superficial vasculature proximal to the mass. The knee was fixed at 15 degrees of flexion. The remainder of the examination was notable only for a left basal pleural rub.

An MRI of the distal thigh was performed (*Figure 1*). This demonstrated a 110×76×117 mm verrucous mass involving the anterolateral and posterior distal thigh, with invasion into bone and surrounding soft tissue, suggestive of an aggressive extremity sarcoma. A repeat PET scan was requested. On this occasion, the entire body, rather than simply the head to pelvis, was scanned. The PET demonstrated intense FDG avidity at the femoral site, with a lesional SUV<sub>max</sub> of 20.6. In addition, metastatic deposits were detected in the adrenal glands, left pleura and brain (*Figure 2*).

After extensive consultation, biopsy of the lesion was undertaken. Histopathology confirmed moderately differentiated adenocarcinoma, with diffusely positive CDX2 staining, suggesting colonic origin. The patient was



**Figure 2** FDG-PET scan demonstrating an extensive soft tissue lesion surrounding the distal femur, as well as FDG avid disease in the thorax, abdomen and brain. FDG, fluoro-2-deoxy-D-glucose; PET, positron emission tomography.

diagnosed with metastatic colon carcinoma.

The patient's painful thigh lesion was treated with pharmacotherapy and palliative intent radiotherapy. Pharmacotherapy included regular subcutaneous hydromorphone, pregabalin, paracetamol, ketorolac and oral methadone. A transdermal 5% lignocaine patch was trialled, to minimal effect. The patient was also treated with external beam radiotherapy (30 Gy in 10 fractions using a volumetric modulated arc therapy technique). One month following completion of radiotherapy, the patient's opioid requirements had reduced, and he was able to cease methadone therapy. His gait remained poor, but he was able to wait-bear on the right leg.

The patient's performance status precluded the use of cytotoxic therapy, and best supportive care was undertaken following treatment of the distal thigh metastasis. He died four months after diagnosis.

## Discussion

We have presented the case of a 76-year-old gentleman who presented with a destructive soft tissue metastasis from metastatic colorectal cancer. It is hypothesized that the patient had metastatic disease at the time of his initial diagnosis, but that this was not ascertained given the limited scan sequences generated on routine, per-protocol PET. The patient had complex palliative care requirements

requiring multimodal analgesia, and died soon after his diagnosis of metastatic disease.

Though uncommon, soft tissue metastases from colon cancer must always be considered in patients presenting with destructive extremity lesions, particularly in those with a history of malignancy (5-7). A number of case reports and case series have been published since the first description of acrometastases at the beginning of the twentieth century (5-20). *Table 1* describes the patient characteristics and location of metastatic disease in select patients with colorectal cancer and extremity metastases. The table highlights the various metastatic sites that may be affected in colon cancer metastasizing to the extremities.

This table highlights the multiple possible manifestations of extremity metastatic disease in colon cancer. Only limited data is available regarding the optimal therapeutic approach to such lesions, with previously employed strategies including surgery, radiotherapy, systemic therapy and supportive care (4,8,10,14). The poor prognostic ramifications of extremity metastases have been highlighted by the available case reports (14,21).

This case also illustrates the limitations of performing FDG-PET scans that end at the lower pelvis. The presented patient had knee pain at the time of his first PET scan, and may have had metastatic disease at this point. His pre-operative PET scan, however, did not extend to the knees or lower legs, and this disease was therefore

**Table 1** Summary of case reports describing extremity metastases in individuals with advanced colon cancer

Author	Year	Age	Sex	Metastatic site
Bryan (4)	1974	61	M	Left lunate
Guttman (8)	1968	84	M	Right thumb
Gottlieb (7)	1970	72	F	All fingers and palm
Hummel (9)	1962	52	F	Left 3 <sup>rd</sup> finger
Wu (10)	1978	83	F	Dorsum right hand
Brette (3)	1961	49	F	Left third metacarpal
Buckley (12)	1987	78	F	Hand
		61	F	Hand
		48	M	Foot
Ellington (14)	2009	70	F	Foot
		84	M	Foot
		76	M	Right distal 5 <sup>th</sup> phalanx
Anoop (13)	2010	76	M	Right distal 5 <sup>th</sup> phalanx
Sur (16)	2011	74	F	Proximal phalanx of hand
Gharwan (15)	2012	54	M	Right 3 <sup>rd</sup> phalanx of hand

unrecognised. Whole body PET scanning is warranted in patients with confirmed malignancy, and we recommend altering institutional policy to reflect this recommendation.

Finally, this case highlights the tenuous road that many incarcerated patients are forced to travel in order to receive care. Changes in location of incarceration, institutional barriers, inadequate communication and insufficient patient empowerment can and do drastically affect the health of prisoners (22,23). This population carry both a higher incidence of cancer and a worse prognosis once diagnosed (22-24). As such, it is our collective responsibility to ensure that health infrastructure adequately supports this vulnerable population.

Strengths of this case report include illustrative radiology, and the proffered review of previously published cases. Limitations include the absence of patient-reported outcomes and the lack of histopathological imagery.

This case report highlights an uncommon consequence of advanced colon cancer and illustrates the management complexity present in caring for patients with soft tissue extremity metastases. Further data regarding the incidence, prevalence and optimal management of such metastases is required.

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## Footnote

*Reporting Checklist:* The authors have completed the CARE reporting checklist. Available at <https://apm.amegroups.com/article/view/10.21037/apm-21-362/rc>

*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at <https://apm.amegroups.com/article/view/10.21037/apm-21-362/coif>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying

images. A copy of the written consent is available for review by the editorial office of this journal.

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