

A Rare Presentation of Metastatic Colon Cancer to the Knee: A Case Report

Rami Abu Omar*, Humaid Al Farii, Javeria Munir, Asmanaz Nadaf, Anjum Osman, Ahmad Ghoche, Rubeya Ahmed and Mansour Al Moundhri

Sultan Qaboos comprehensive cancer center and research, Sultan Qaboos Comprehensive Cancer Center, Muscat, Oman

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*Corresponding author: dr.ramiabuomar@gmail.com

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Abstract

Metastatic colon cancer is a prevalent and devastating disease that often spreads to distant sites, including the liver (most common), lung, and other parts of the body. The presence of colon cancer metastases in the knee is rare and can lead to significant morbidity, impairing the quality of life for affected individuals. We report a case of a 48-year-old Omani female patient diagnosed with metastatic colon cancer who developed progressive disease with relapse to the knee, confirmed by radiology and histopathology.

Keywords: Colon Cancer; Knee; Oman.

Introduction

Colorectal cancer (CRC) is the third most frequently diagnosed cancer and the third leading cause of cancer death in men, as well as the fourth leading cause in women, in the United States for 2024.¹ Approximately 50% to 60% of patients diagnosed with CRC develop colorectal metastases,¹ and 80% to 90% of these patients have unresectable metastatic liver disease. Colorectal cancer mainly metastasizes to the liver, lung, peritoneum, bone, and brain.²

In Omani Population colon and rectum had the highest annual percent change (APC) in the male population and the second highest APC, after uterine cancer, in the female population from 1996 to 2019.³

Case Report

A 48-year-old Omani woman was diagnosed with stage III colon cancer in November 2015. She received adjuvant FOLFOX (oxaliplatin + 5-fluorouracil) until August 2016. CT staging in March 2017 revealed bilateral lung nodules, for which she underwent VATS (video-assisted thoracoscopic surgery) wedge resection of the right lung, confirming metastatic adenocarcinoma from the colon. She started FOLFIRI (irinotecan with 5-fluorouracil) + Bevacizumab from June 2017 to January 2018, showing a good partial response by CT staging.

In February 2018, she began maintenance chemotherapy with Capecitabine + Bevacizumab, completing 11 cycles with a good radiological response. She discontinued treatment on her own and presented in June 2019 with disease progression evident on CT staging, showing new lung nodules. She received multiple lines of anticancer therapy until July 2023, when she complained of left knee pain and swelling.

On examination, she exhibited right knee swelling that was hard in nature with tenderness throughout. She had a limited range of motion due to pain, with passive motion limited from 0 to 30 degrees. Her distal neurovascular

examination was normal [Figure 1]. X-ray of the knee showed unremarkable findings. Subsequent CT of the knee revealed an osteoblastic lesion in the anteromedial proximal tibia involving the intra-articular knee capsule. MRI of the knee demonstrated a large soft tissue mass extending from the distal meta-diaphysis of the right femur to the proximal right tibia [Figure 2].

She underwent radiotherapy with a single fraction of 8 Gray followed by multimodal analgesia, including regional block and epidural, which provided no relief.



Figure 1: Right side knee swelling, shiny surface with deformity, tenderness positive with limited mobility, no redness or discharge.

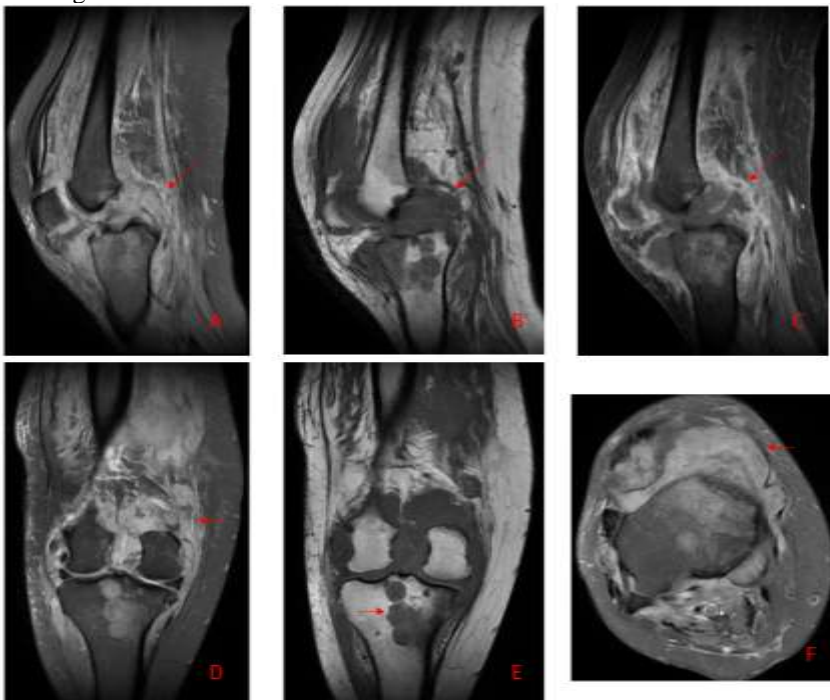


Figure 2: MRI showed a large soft tissue mass extending from the distal meta-diaphysis of the right femur to the proximal right tibia, as shown by arrows in (Image A and D – Sagittal and Coronal PD fat, respectively), (Image B – Sagittal T1). It demonstrated heterogeneous enhancement and encased the adjacent bones (arrows on post-contrast images C and F). Abnormal T1 weighted marrow signal involving the proximal tibia (Arrow in Image E – Coronal T1). No obvious pathological fracture.

She underwent a CT-guided needle biopsy of the right distal meta-diaphysis, confirming the diagnosis of metastatic colorectal carcinoma [Figure 3 A and 3B]. Following a multidisciplinary team meeting, a decision was made to proceed with palliative knee surgery, including tumor debulking. Intraoperatively, classified synovitis was resected through an anterior knee arthrotomy approach [Figure 4].

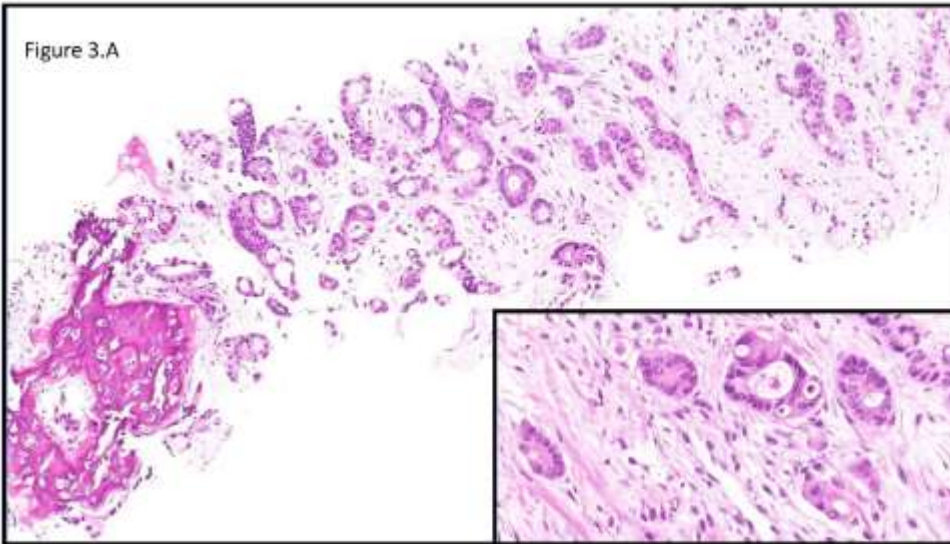


Figure 3.A: (Hematoxylin and Eosin)H & E, Low power: Core biopsy from swelling of knee joint shows tumor cells arranged in cribriforming glands with adjacent knee joint cartilage. **Inset** shows pleomorphic vesicular nucleus with 2 to 3 prominent nucleoli with slight luminal necrosis.

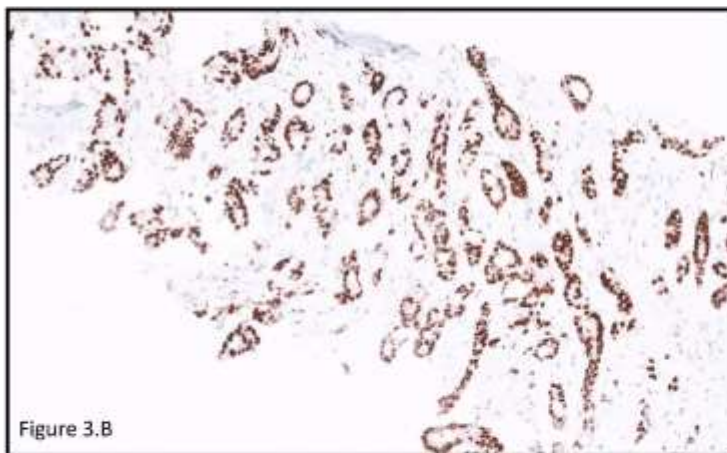


Figure 3.B , (Immunohistochemistry) IHC; Low power: The tumor cells show strong positivity for CDX2 consistent with mostly tumors of gastrointestinal tract/colonic origin.

Figure 3: The tissue biopsy from right distal meta diaphysis.



Figure 4: Right knee arthrotomy with exposed thick-looking synovium, and piecemeal excision of lesions.

The patient recovered well from the procedure with extensive physiotherapy, regained mobility, and resumed daily activities without pain. Subsequently, she commenced third-line chemotherapy with Lonsurf (trifluridine and tipiracil) and bevacizumab.

Discussion

Metastatic colon cancer of the joints is exceedingly rare,⁴ with only a few cases reported in the literature. It carries significant implications for morbidity due to pain and impaired mobility. Although the exact incidence is not well defined, it is believed to occur in a small percentage of patients.

Malignancies involving the knee are uncommon and typically arise from primary bone tumors such as osteosarcoma.⁵ The oldest review we found, conducted by Kransdorf et al., analyzed 42 cases of knee tumors confirmed by radiology and histopathology. Among these, 38 cases were benign, including 16 chondroblastomas, while only 4 were malignant.⁵ Benign neoplasms and tumor-like conditions account for 70–90% of primary patellar lesions, with examples including giant cell tumors, chondroblastomas, gout, and bone cysts.⁵

Metastatic disease involving the knee is even rarer than primary malignant tumors. Roth et al. reported a 5.5% incidence of bone metastasis from primary colon cancer.⁶ The majority of bone metastases originate from lung cancer, breast cancer, renal cell carcinoma, and prostate cancer.⁷

Gasagranda et al. reported a case of colon adenocarcinoma relapse in soft tissues along the ventral aspect of the distal femur, within the joint space, and involving the patella in a male patient. The diagnosis was confirmed by biopsy and treated with resection of the distal right femur, proximal tibia, and knee joint reconstruction with a distal femoral replacement and hinge knee arthroplasty, given the absence of other metastatic sites.⁸

On the other hand, Subhashini et al. reported a 60-year-old female patient with metastatic colon adenocarcinoma that had spread to the lungs and left knee. The early presentation of her cancer included the identification of metastasis to the knee, which was confirmed by synovectomy and biopsy.⁹

Gonzalo Tapia Rico et al. reported a case of a 31-year-old woman with metastatic colon adenocarcinoma that had spread to the liver and lungs. Her condition progressed during first-line chemotherapy, and she experienced right knee pain crises. Investigations, including right synovectomy and biopsy, confirmed metastatic adenocarcinoma originating from the primary colon.¹⁰

Conclusion

Metastatic cancer reaching the knee represents a significant advancement of the disease. Collaboration among oncologists, orthopedic specialists, and other healthcare professionals is essential in developing personalized treatment plans tailored to the unique needs of each patient. Despite the challenges posed by metastatic cancer in the knee, ongoing advancements in medical science provide hope for improved outcomes and enhanced quality of life for affected individuals.

Diclosure

Verbal consent was obtained from the patient and documented by the patient's son.

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