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CASE REPORT | COLON

Vertebral Metastasis as the Initial Manifestation of Colon Cancer

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ABSTRACT

Oncology guidelines currently recommend against performing colonoscopies in the workup of adenocarcinoma of unknown primary unless colonic malignancy is otherwise suggested by clinical signs or symptoms. We present 2 cases of metastatic colonic adenocarcinoma that presented only with neurologic symptoms from vertebral metastasis. Although bony metastases are a rare presentation of colon cancer and colonoscopy is not warranted in the initial workup of adenocarcinoma of unknown primary, we describe these cases as a reminder that bony metastases do not rule out a colon cancer diagnosis.

INTRODUCTION

Traditionally, colon cancer is not thought to metastasize to bone, unlike breast, prostate, or lung cancers. Further, international guidelines of the National Comprehensive Cancer Network and European Society for Medical Oncology recommend against endoscopy in the workup of adenocarcinoma of unknown primary, unless otherwise suggested by clinical symptoms, laboratory, or imaging findings.[1,2]

CASE REPORT

Case 1: A 34-year old female with a history of type 1 diabetes presented to the hospital with sudden onset bilateral lower extremity paralysis and numbness for 1 day. The patient had a history of persistent back pain for the past 8 months. Magnetic resonance imaging (MRI) performed 1 month prior at an outside hospital showed a T11 vertebral lesion causing stenosis of the spinal canal and cord compression, which was being evaluated in the spine orthopedics clinic. The night prior to presentation, the patient fell and was subsequently unable to move her lower extremities or feel below the waist. Upon arrival, the patient was taken emergently to the operating room for T10-T11 laminectomy and T8-L2 fusion with biopsy of the vertebral lesion, which revealed adenocarcinoma (Figure 1). Specifically, it showed moderately differentiated adenocarcinoma with abundant mucin (Figure 2). Tumor cells were strongly positive for CK19, CK20, and CDX-2 but negative for CK7, TTF-1, Pax-8, and BRST-2. Morphology and immunohistochemistry pattern were most consistent with a metastasis from a primary malignancy in the lower gastrointestinal tract.

Chest, abdominal, and pelvic computed tomography (CT) imaging subsequently demonstrated a 4.5-cm ascending colon mass but no other signs of metastasis. Colonoscopy was performed with biopsy of this ascending colon mass (Figure 3). The colonoscope was traversed past the mass, and no metachronous or synchronous lesions were found proximal to the site, although the patient had a poor prep that could have obscured smaller findings. Biopsy of the colon mass confirmed the diagnosis of primary colonic adenocarcinoma. Specifically, it showed a moderately

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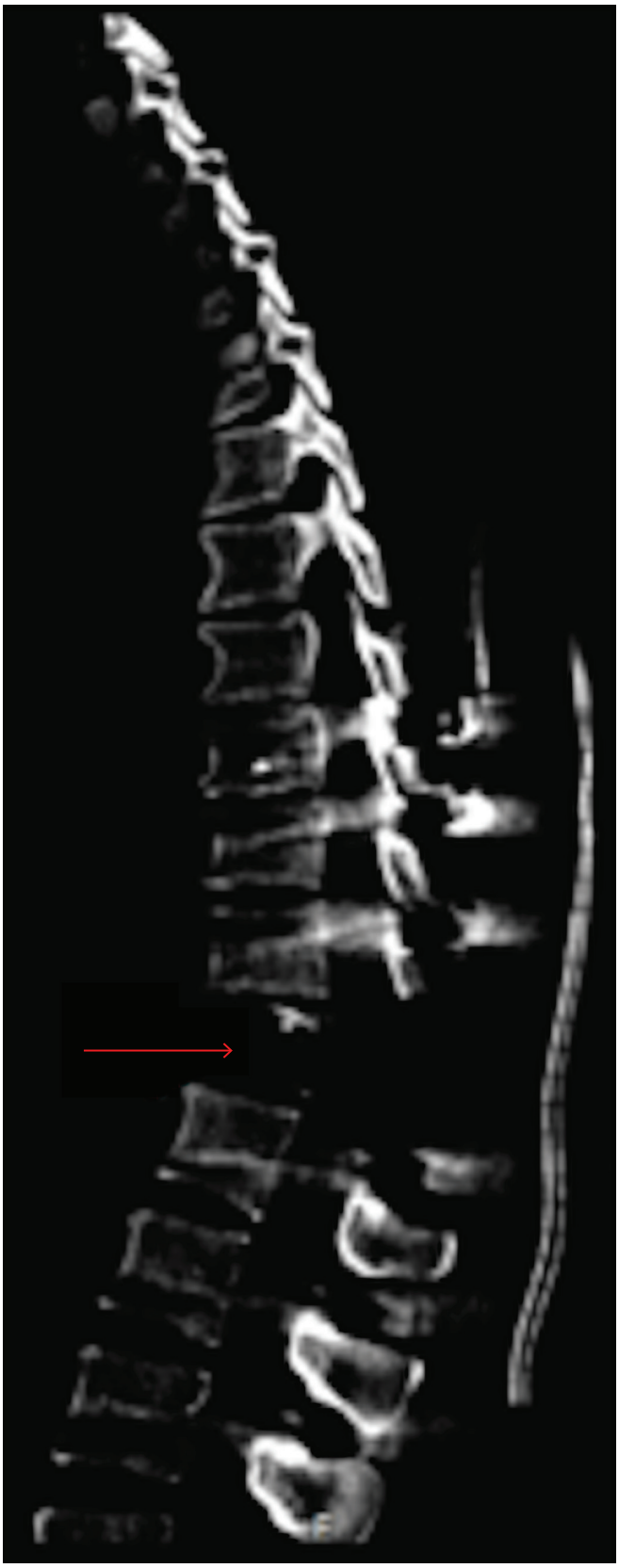

Figure 1. Spinal CT demonstrating T11 vertebral lesion.

differentiated adenocarcinoma arising from an adenoma. The adenocarcinoma focus consisted of confluent cribiform glands with minor mucinous differentiation (Figure 4). No K-RAS or BRAF mutations were identified. Furthermore, there was retained expression of MLH-1, MSH-2, MSH-6, and PMS-2 ruling against microsatellite instability.

There was no family history of colon cancer. Her father had prostate cancer, and a maternal great aunt had gastric cancer. Laboratory values on admission were significant for anemia with a hemoglobin of 7.9 g/dL and borderline microcytosis, as well as a normal serum calcium level. Given her age, recommendations were made for genetics evaluation and counseling as an outpatient.

Case 2: A 61-year old female with a history of hypertension presented with progressive pain and numbness of her bilateral upper extremities. Two months prior, she experienced severe neck pain, leading to the discovery of a C5-C6 compression fracture. At that time, she underwent decompression and anterior cervical spinal fusion of C4-C7 with vertebral biopsy, which revealed adenocarcinoma. She then underwent CT imaging, which revealed several pulmonary nodules 3 to 10 mm in diameter, multiple enlarged mediastinal lymph nodes up to 12 mm, and multiple lytic skull foci 3 to 10 mm. Thyroid, breast, pelvic, and abdominal ultrasounds were performed as well, with no signs of primary malignancy discovered.

On presentation, the patient reported worsening numbness, weakness, and paresthesia of her upper extremities over the course of a few weeks. Total spine MRI revealed a T3 vertebral body infiltrative mass with circumferential compression of the spinal cord (Figure 5). The patient denied saddle anesthesia, bowel or bladder retention or incontinence, or new onset back pain. The neurosurgery team recommended no acute surgical intervention given that the patient was neurologically intact below T3, the region with the worst cord compression on imaging. Thus, the vertebral lesions were not biopsied at our hospital.

The patient subsequently underwent CT imaging for staging of her adenocarcinoma of still unknown primary, which again revealed pulmonary nodules, as well as 4 newly detected hepatic metastases up to 2 cm and a 15-cm sigmoid lesion. Colonoscopy demonstrated a stricture in the sigmoid colon with irregular mucosa. The sigmoid stricture could not be traversed with a regular or pediatric colonoscope. Therefore, it is unknown whether there were any metachronous or synchronous lesions proximal to the site. Biopsy confirmed the diagnosis of primary colonic adenocarcinoma.

There was no family history of colon cancer. Her father had renal cancer, and her mother had leukemia. The patient had a mild anemia with a hemoglobin that fluctuated between 12.1

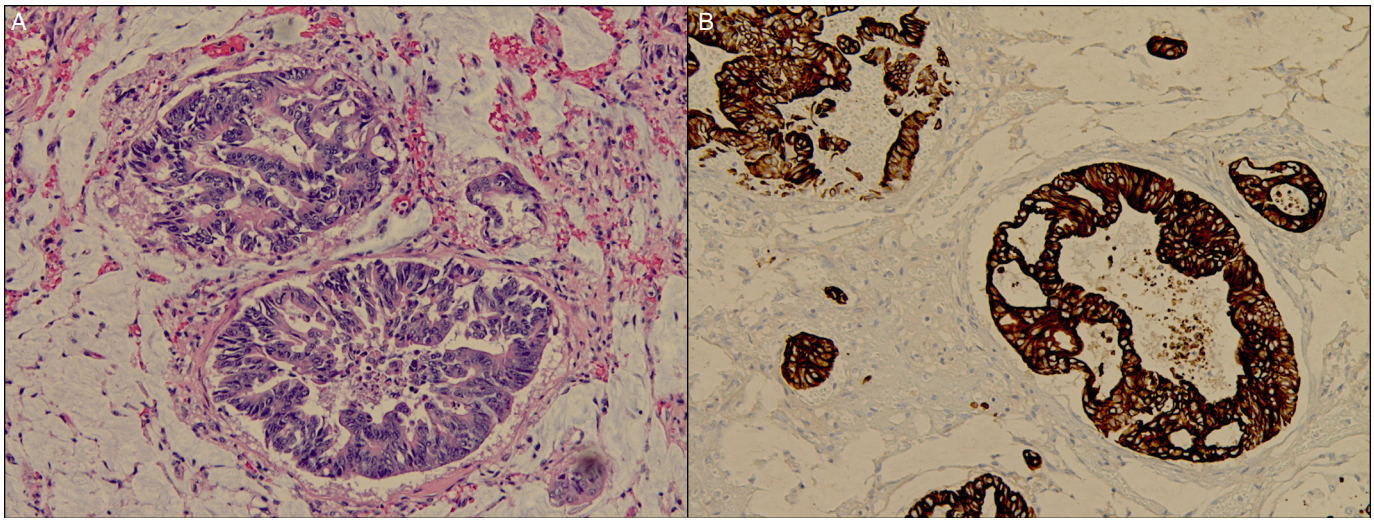

Figure 2. (A) Hematoxylin and eosin stain of the T11 vertebral lesion demonstrated moderately differentiated adenocarcinoma with complex glandular structures with abundant mucin and necrosis. (B) Immunostaining of the T11 vertebral lesion showed tumor cells to be strongly positive for CK20, a marker that supports a tumor of lower gastrointestinal tract origin.

and 14.1 g/dL during admission. Her ferritin was within the low-normal range at 54 ng/mL with a low transferrin saturation of 7%. Her serum calcium level was normal.

DISCUSSION

Based on the literature, colorectal cancer rarely metastasizes to the bone. Chart review studies of medical or autopsy records have reported that 2%-24% of colorectal cancer cases have bony metastases, with only 1%-2% of colorectal cancer cases having isolated skeletal metastasis.[3-9] Of the subset of colorectal cancers that do metastasize to bone, the first and second most common sources of the primary cancer are the rectum and cecum, respectively. The most common sites for the metastasis include the spinal column, followed by the hip or pelvis, long bones, and lastly other sites, such as the hands, feet, and skull. The bony metastases are most often osteolytic, followed by mixed and osteoblastic lesions.[3-9] One proposed mechanism of spread of colorectal cancer to bone is via Batson's venous plexus, a network of valveless veins that connect the deep pelvic and thoracic veins to the internal vertebral venous system.[5-7]

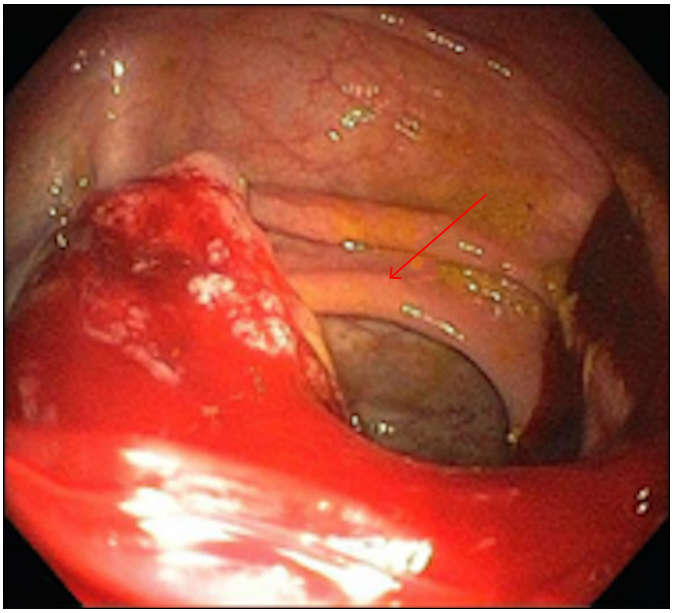

Figure 3. Colonoscopy demonstrating ascending colon mass.

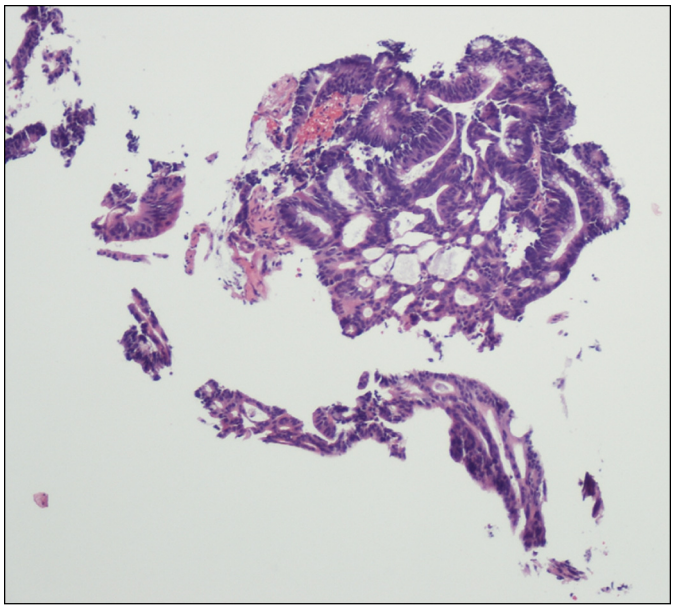

Figure 4. High magnification of the colon mass adenocarcinoma focus showed confluent cribiform glands with minor mucinous differentiation.

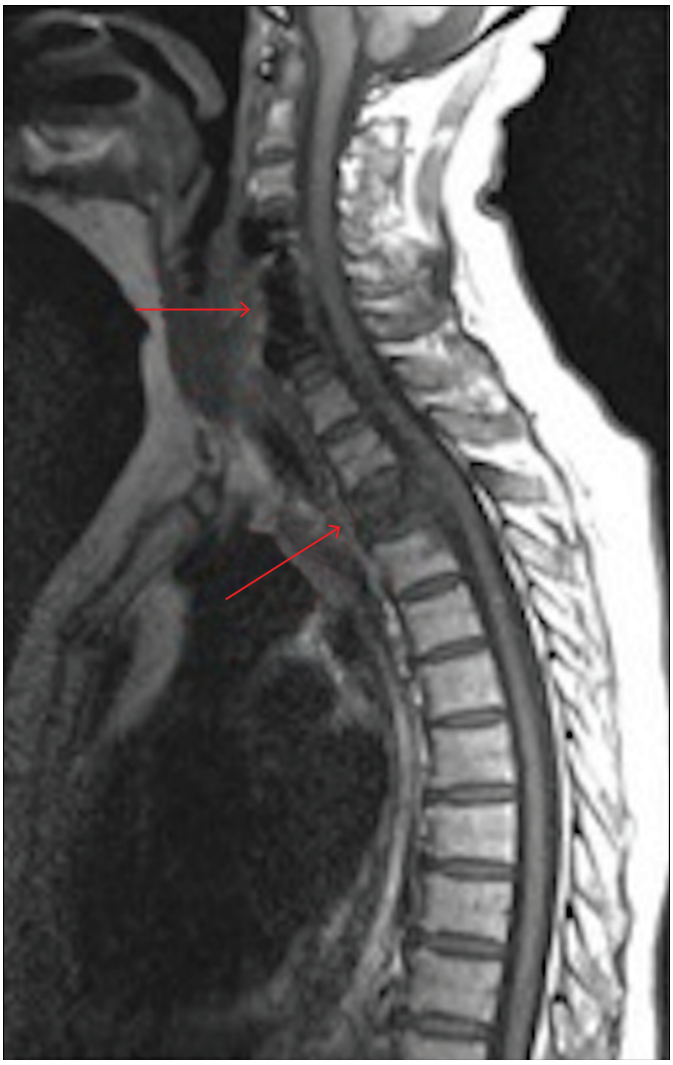

Figure 5. Spinal MRI demonstrating T3 vertebral lesion as well as cervical lesions.

Interestingly, the bone metastases included in the literature thus far were almost always discovered following diagnosis and initiation of treatment for the colorectal cancer. In contrast, we present 2 patients, without gastrointestinal symptoms, who both presented with spinal cord compression from vertebral metastases of adenocarcinoma, which were later revealed to originate from a colonic source. Case 1, furthermore, is an example of isolated bony metastasis. These 2 cases highlight an unusual presentation of colon cancer, and they underscore the importance of having colon cancer on the differential diagnosis in patients with bony metastases from adenocarcinoma of unknown primary, despite its rare occurrence.

DISCLOSURES

Author contributions: T. Jain drafted the manuscript. LA Chen and R. Williams supervised and edited the manuscript. B. Liechty contributed the pathology images. LA Chen is the article guarantor.

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Informed consent was obtained for this case report.

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