



A Case of Metastatic Gastric Leiomyosarcoma With Bilateral Adrenal Involvement and Complications

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ABSTRACT

Gastric leiomyosarcoma is a rare entity with only a handful of cases reported in the literature. Although this entity has been known to metastasize, there are currently no reported cases of metastatic leiomyosarcoma to the bilateral adrenal glands. We report a case of a 58-year-old woman with primary gastric leiomyosarcoma with bilateral metastasis to the adrenal gland. This case illustrates a presentation of gastric leiomyosarcoma with bilateral adrenal involvement, the challenges in its diagnosis, treatment, as well as a rare complication of primary adrenal insufficiency and adrenal crisis.

INTRODUCTION

Soft-tissue sarcomas (STSs) are a variable group of malignancies that represent only 1% of all adult cancers¹ and include over 70 molecular subtypes. Leiomyosarcoma (LMS) accounts for 25% of all diagnosed cases of soft-tissue sarcomas.² LMS typically originates from smooth muscle cells or mesenchymal stem cells that are programmed to differentiate into smooth muscle cells. Although these cells are detected throughout the human body, they most notably occur in the extremities and abdominopelvic organs.³ LMS involving the gastrointestinal tract is a rare entity that is distinct from gastrointestinal stromal tumors (GISTs), a more commonly known soft-tissue neoplasm. Although the gross and microscopic morphologies of LMS share similarities to that of GIST, they have different molecular profiles with unique therapeutic challenges.⁴ Unfortunately, there are few reported cases of gastrointestinal tract LMS, and many of the reported cases were actually GISTs of the stomach.⁵ We report a case of gastric LMS with metastatic disease to the bilateral adrenal glands that eventually led to adrenal crisis.

CASE REPORT

The patient was a 58-year-old woman who was originally seen in the emergency department for abdominal pain, 70-pound weight loss over 6 months, and vomiting concerning for obstruction. A nasogastric tube was placed for a concern of obstruction, and she then underwent an esophagogastroduodenoscopy and endoscopic ultrasonography, which showed a 2-cm duodenal mass. Computed tomography (CT) showed multiple masses to the small bowel, bilateral adrenal glands, cervical lymph nodes, lung, liver, and retroperitoneal space, representing metastatic disease. Biopsy of the duodenal mass showed tumor cells which were positive for vimentin and caldesmon and negative for chromogranin, synaptophysin, S100, Melan A, Sox10, inhibin, desmin, CD45, c-kit, and DOG1. The adrenal glands were also biopsied, which showed similar findings as the duodenal mass. Based on these pathology results, she was diagnosed with metastatic gastric LMS, and her obstruction improved with conservative medical management.

The patient received first-line therapy with doxorubicin, ifosfamide, and mesna (AIM). After 4 cycles, there was a decrease in sizes of bilateral adrenal gland metastases, resolution of jejunal lesions, and stable lymph nodes, meeting the partial response by response evaluation criteria in solid tumors (RECIST). The patient received 2 more cycles of AIM, with interval CT showing progression at which time she was switched to gemcitabine and docetaxel. After 3 cycles of gemcitabine and docetaxel, the patient presented to the emergency

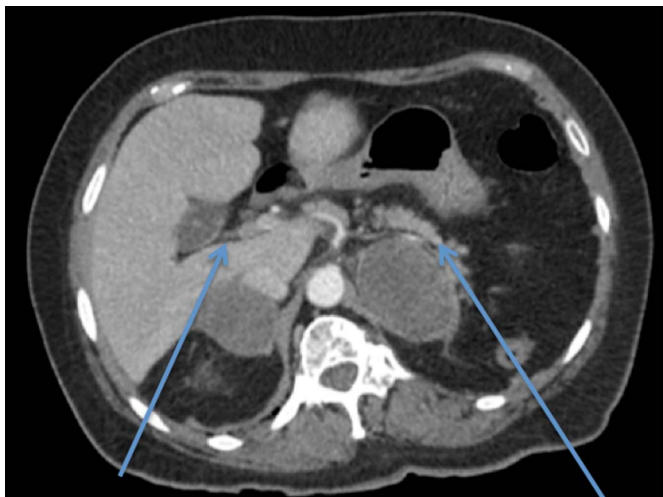


Figure 1. Abdominopelvic computed tomography with contrast showing bilateral adrenal metastasis from gastric leiomyosarcoma, as shown with the lines.

department for 3 weeks of worsening fatigue, weakness, and back pain. Her physical examination was notable for tachycardia at ~100 beats per minute and hypotension with systolic blood pressure in the 60–70's mm Hg. Laboratory evaluations included sodium at 109 mEq/L, potassium at 5.8 mEq/L, chloride at 80 mEq/L, bicarbonate of 19 mEq/L, magnesium of 1.6 mg/dL, and a serum alkaline phosphatase level of 160 IU/L.

On admission, CT scans of the chest, abdomen, and pelvis revealed new lung nodules, a stable left adrenal mass, enlarging right adrenal mass, and a new mass of 1.4 cm in diameter in the right kidney (Figure 1). Overall, these changes represented progressive disease on gemcitabine and docetaxel. The patient's presentation was consistent with primary adrenal insufficiency that lead to adrenal crisis secondary to her metastatic disease involving both of her adrenal glands. She was treated with hydrocortisone and fludrocortisone, with improvement in her symptoms. The patient died 2 months later because of complications from her metastatic disease.

DISCUSSION

Gastric leiomyosarcomas are extremely rare and represent less than 1% of gastric tumors.⁶ LMS frequently metastasizes to the lung, liver, brain, and bone.⁷ Diagnosis usually occurs when patients experience site-specific symptoms related to compression from a mass and/or organ dysfunction, such as in our patient. CT and magnetic resonance imaging can facilitate visualization of the mass, although definitive diagnosis depends on the results of tissue biopsy.^{8,9} Treatment of localized disease involves tumor resection. By contrast, metastatic disease is often incurable; in these cases, the goal of treatment is focused on controlling symptoms, decreasing tumor bulk, and prolonging survival.³

The diagnosis of gastric LMS is based on biopsy and pathology. In greater than 70% of cases, SMA, desmin, and h-caldesmon

are positive and CD117 (*KIT*), DOG1, and CD34 are negative.^{10,11} Because around 10% of GISTs are KIT-negative, gene analysis of KIT can lead to a conclusive diagnosis of gastric LMS. Our patient's biopsy showed that her tumor was positive for caldesmon and negative for c-kit and DOG1, which is more consistent with LMS rather than GIST. As of 2019, there were 13 documented cases of gastric LMS¹²; there is little to no literature describing metastatic LMS to the bilateral adrenal glands causing primary adrenal insufficiency and adrenal crisis as was seen in this case.

Treatment decisions are challenging because of the paucity of data. An anthracycline-containing regimen such as AIM is often used in the first-line setting for advanced/metastatic soft-tissue sarcomas as was shown in a phase 3 trial, which showed that doxorubicin and ifosfamide had an overall response rate of 26% compared with 14% in the doxorubicin group.¹³ For leiomyosarcoma-specific therapy, gemcitabine (GEM) plus docetaxel (DOC) and trabectedin has been studied. GEM and DOC has efficacy for uterine LMS as shown in the phase 2 trial that looked at the safety and efficacy of GEM and DOC and found an overall response rate of 53% among 34 patients treated with this combination.¹⁴ Trabectedin has been used in subsequent lines of therapy based on a phase II trial showing time to progression of 3.7 months and median progression-free survival of 3.3 months.¹⁵ In addition, treatment can be guided by findings in next-generation genomic sequencing, particularly neurotrophic tyrosine receptor kinase, or microsatellite instability. Overall, gastric leiomyosarcomas are rare entities, and differential diagnoses between gastric leiomyosarcomas and GISTs are important. Because it is a rare entity, its prognosis remains unclear, and research needs to be performed to help improve survival and patient outcomes.

DISCLOSURES

Authors' contributions: Y. Samara edited the article and provided the images. J. Lee edited the article and is the article guarantor. All authors read and approved the final article.

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