

## **Diagnosis of endometrial cancer complicated by morbid obesity—a case report**

Janna Girardi, MD,<sup>1</sup> Michael J. Goodheart, MD,<sup>1,2</sup>

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<sup>1</sup>*The Department of Obstetrics and Gynecology, The Carver College of Medicine, The University of Iowa, Iowa City, Iowa, USA*

<sup>2</sup>*Holden Comprehensive Cancer Center, The University of Iowa, Iowa City, Iowa, USA*

### **Case Report**

A 47 year old nulligravid female presented to a local hospital with chest pain and shortness of breath. Her history was also significant for menorrhagia and irregular menses of approximately 15 years duration. At the outside facility, computed tomography (CT) of the chest confirmed pulmonary embolism, and endometrial biopsy performed showed grade 1 endometrioid adenocarcinoma with squamous differentiation. She was transferred to our hospital at that time. Her medical history is significant for morbid obesity with a body mass

index (BMI) 75, type 2 diabetes, obstructive sleep apnea, obstructive pulmonary disease and unprovoked deep vein thrombosis (DVT) for which she was anticoagulated for 5 years prior to presentation. During her 3 day hospitalization, CT scan performed demonstrated pelvic, retroperitoneal, inguinal and right axillary lymphadenopathy, and hepatomegaly with grossly unremarkable uterus and ovaries. Due to the burden of disease, axillary and inguinal lymph node biopsy was attempted, however due to depth of nodes, the tissue was not reached and biopsy efforts were abandoned. Due to poor performance status and medical comorbidities, she was referred to radiation oncology and plans were made to complete 45 gray pelvic radiation therapy for palliation.

She presented 5 weeks later with recurrent chest pain and shortness of breath. Spiral CT of the chest

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**Corresponding author:** Michael J. Goodheart, MD. Department of Obstetrics and Gynecology, University of Iowa Carver College of Medicine, 4631 JCP, 200 Hawkins Drive, Iowa City, IA 52242. Telephone (319)356-2015. [michael-goodheart@uiowa.edu](mailto:michael-goodheart@uiowa.edu)

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demonstrated numerous lesions that were not identified on the prior CT, which were concerning for metastatic disease. Again, she was ruled out for cardiac cause of disease as well as pulmonary embolism. The degree of lymphadenopathy had worsened in the subsequent 5 weeks as well (as she was not treated systemically). Due to the discordance between endometrial biopsy and clinical presentation, biopsy was attempted. Interventional radiology was consulted, but was not able to perform CT guided biopsy due to the patient's size, as they were unable to manipulate the needle while performing CT guidance. Ultrasound guided biopsy was attempted (as the inguinal and axillary lymphadenopathy had worsened), but only reactive tissue returned which broadened the differential. Pulmonology was consulted and did not believe the peripheral lesions were amenable to biopsy, however there was a subcarinal lymph node that could be biopsied under general anesthesia in the main operating room. Ultrasound performed showed no evidence of liver metastases, however exam was limited by body habitus. GI was consulted to attempt to endoscopically biopsy the lymph nodes. They were able to aspirate the lymph node on hospital day #4, with the results read as metastatic adenocarcinoma. Additionally aspiration of an identified liver lesion at time of endoscopy was performed, and showed adenocarcinoma. The original endometrial tissue was stained and was ER/PR positive with greater than 50% staining noted.

The aspirated lymph node material staining was notable for CK7 positivity, but negative for CK20, WT-1, TTF-1 and ER/PR. She was discharged after 5 days in the hospital.

She again presented 1 week later with chest pain and dyspnea. CT to evaluate for pulmonary embolism (PE) demonstrated pulmonary nodules that had increased in size in the 13 day interval. No pulmonary embolism was detected and no evidence of cardiac disease was noted.

Ultimately within the month, the patient elected to go into hospice, after worsening metastatic disease. Pelvic radiation therapy improved her menorrhagia. She shortly thereafter succumbed to her disease.

## **Discussion**

The above case demonstrated to the hospital team the complexity that morbid obesity adds to treating patients with all cancers. Our team encountered numerous difficulties in obtaining biopsies for diagnosis. We often utilize interventional radiology for CT-guided biopsy of lesions that are suspicious prior to treatment planning, to assess burden of disease, or to confirm diagnosis when the clinical picture does not match the prior biopsy. Our suspicion in her case was elevated for a neuroendocrine component, mixed mullerian tumor, or dual primary. Thus to confirm a diagnosis, additional tissue had to be obtained from an endoscopic biopsy.

There is little published regarding the diagnostic difficulties morbid obesity places on patients and physicians alike. The physical exam is often more difficult and less reliable for positive or negative findings.<sup>1</sup> It is well known that increased BMI is associated with increased all-cause mortality.<sup>2</sup> Morris et al<sup>3</sup> found that outer appearances of obesity did not correlate with poor outcomes for major upper abdominal operations, however a simple measurement of perinephric fat (as a surrogate for intra-abdominal fat) gave a more useful risk assessment.

According to the American College of Radiology<sup>4</sup> imaging is limited by obesity. For computed tomography, limits are due to gantry diameter (90 cm in newer units) and table capacity (680 lbs in newer units – both of which have been improving in recent years). Magnetic resonance tends to be more limited than CT (newer units with 70 cm bore and 550 lb capacity). Ultrasound tends to be the most affected by obesity at a weight of approximately 250 lbs, however distribution is important, as excessive subcutaneous fat yields poor image quality due to attenuation of beams prior to reaching intraperitoneal structures (versus larger amount of intraperitoneal fat with less subcutaneous fat). Fluoroscopy is limited by the tight aperture of 45 cm and table capacity of 350 lbs.

When adding imaging-guided biopsy of these patients, the difficulties are compounded. For example, in our patient, she was able to fit into the CT scanner (albeit tightly) however

the interventional radiologist was not able to biopsy during the CT guidance as the needle required to biopsy the lesion was long, and could not be maneuvered adequately to obtain tissue for diagnosis. An option that was considered but not pursued was the veterinary CT scan, which can accommodate a larger habitus. The ultrasound quality was severely limited, and biopsy attempts only returned reactive tissues, even though the lymphadenopathy was palpable. A video-assisted thoroscopic surgery procedure was considered to remove a peripheral lung lesion, however due to the worsening pulmonary complications, this was abandoned to proceed with endoscopic biopsy.

It required a great deal of discussion with the radiology department to decide which lesion would be least morbid to biopsy. After failed attempts at several methods, the gastroenterologist consulted felt the retroperitoneal lymphadenopathy adjacent to the duodenum was a possibility. The sample was sparse, but confirmed a metastatic adenocarcinoma and ruled out an inflammatory or granulomatous process.

It is well known that increasing body mass index is associated with endometrial cancer, both incidence and prognosis. Numerous cohort studies have found associations with elevations of BMI and endometrial cancer risk. The Million Women Study authors noted a relative risk per 10 units BMI of 2.89.<sup>5</sup> Additionally, a large systematic

review in 2008 noted a relative risk per 5 units BMI of 1.59.<sup>6</sup>

Not only does the incidence of endometrial cancer increase, but the all-cause mortality is elevated. In a large cohort registry from the American Cancer Society, the authors found that the relative risk from death due to cancer in the uterine corpus is greatly increased with BMI 35-39.9 (RR 2.7) and BMI  $\geq$  40 (RR 6.25).<sup>7</sup> The uterine corpus was the body site most affected by BMI.

It has not yet been elucidated as to whether obesity is a risk factor for death from endometrial cancer (as most studies support increased risk for all-cause mortality, not cancer-related), or cancer recurrence. A retrospective review in 2006 failed to demonstrate a relationship between morbid obesity and endometrial cancer recurrence. Other literature supports obesity as a risk factor in breast, colon and prostate cancer recurrence.<sup>8</sup>

It is estimated by the WHO that in 2015, 700 million adults will be obese. Physicians generally have negative attitudes towards obese patients. In previous surveys, 50% of physicians viewed obese patients as "awkward, unattractive, ugly, and noncompliant", while 72% of physicians felt poorly prepared to manage obesity in general.<sup>9</sup> The lack of preparation likely begins in medical school and in most cases, lasts the career of the physician.

## **Conclusion**

Ultimately, this unfortunate woman's obesity caused her to have a worse outcome, not only due to medical comorbidities, but also with regards to delayed diagnosis and treatment and progression of disease. As the obesity epidemic worsens, this is likely to occur more commonly. It is important to realize the limitations of our consults as all aspects and fields of medicine are limited by morbid obesity. It is a strong working relationship with other providers that allowed us to eventually find an answer.

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