Case Report

Rare presentation of metastatic cervical cancer to the right upper extremity skeletal muscle and gluteal adipose tissue

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Abstract

Metastatic patterns of squamous cell cervical cancer are well described in the literature. Advancements in radiologic imaging have improved the ability to detect unusual sites of metastatic disease. We describe a unique case of isolated distant metastases to the skeletal muscle and adipose tissue detected by PET-CT. A patient with a new diagnosis of squamous cell cervical cancer was incidentally found to have FDG-avid lesions in the right upper extremity skeletal muscle and right gluteal adipose tissue without other evidence of metastatic disease. Initial cytology of the right upper extremity lesion revealed no evidence of malignancy. After the patient developed worsening pain and swelling in the right arm and gluteal region, repeat cytology confirmed metastatic squamous cell cervical cancer. With increasing sensitivity of radiologic imaging studies, the frequency of incidentally noted lesions is likely to rise and may be challenging to interpret in a patient with a history of malignancy. Continued assessment and reporting of these lesions is imperative for improved understanding of the natural history of disease.

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Introduction

Cervical cancer is the fourth most common cause of cancer in women worldwide.[1] The American Cancer Society estimates that more than 13,000 cases of cervical cancer will be diagnosed in 2020 in the United States alone.[2] The most frequent sites of distant metastases in squamous cell carcinoma of the cervix are the lymph nodes, lung, bone, liver, and peritoneum.[3,4] This case report describes a rare presentation of axillary skeletal muscle and gluteal adipose tissue metastases in a patient with a history of squamous cell carcinoma of the cervix.

Case description

The patient is a 56-year-old gravida 3 para 2 who presented to her primary care provider in June 2016 with 9 months of postmenopausal bleeding and 3 months of pelvic pain and bloating. A Pap smear was performed that resulted as a high-grade squamous intraepithelial lesion with positive high-risk human papillomavirus (HPV) testing. The patient was referred to the Gynecologic Oncology Division for consultation, and a loop electrosurgical excision procedure was performed. Pathologic examination of the cervical specimen revealed a diagnosis of poorly differentiated squamous cell carcinoma. Immunostaining was patchy positive for pan-HPV, however HPV-16 and HPV-18 staining were negative. Additional immunostaining was patchy positive for PAX8 and positive for cytokeratin 5 and 6.3. The patient underwent an fluorodeoxyglucose (FDG)-positron emission tomography (PET)/computerized tomography (CT) for staging which revealed FDG-avid areas in the cervix (9.1 SUV), 1 right external iliac node, the right gluteal adipose tissue (well-defined measuring 1.5 cm, 2.6 SUV), and the right proximal biceps muscle (8.6 SUV) [Fig. 1A & B]. The areas of FDG-avidity in the gluteal adipose tissue and right proximal biceps were felt to be inflammatory rather than metastatic lesions with interval follow up recommended. Therefore, based on her clinical exam, the patient was determined to be FIGO stage IIB. The

Fig. 1A – 18F-FDG PET 3D MIP obtained for initial staging shows irregular intense radiotracer uptake in the right axillary region (yellow arrow) and overlying the right gluteal musculature (blue arrow). Intense cervical and lower uterine segment activity from known cervical cancer (green arrow) is partially obscured by physiologic urinary bladder activity. B. 18F-FDG PET/CT coronal fused image from initial staging shows intense radiotracer activity associated with a soft tissue mass expanding the short head of the biceps muscle (white arrow). Intense radiotracer uptake in the region of the cervix/lower uterine segment, at the site of known malignancy, is partially imaged (green arrow).
patient was treated with 25 fractions of external beam radiation therapy (EBRT) to the pelvic and paraaortic lymph node region, uterus, cervix, vagina and parametrium for a dose of 45 Gy with a simultaneous integrated boost to a pathologic right external iliac lymph node at 55 Gy. Concurrent weekly cisplatin therapy was administered during EBRT. The patient then received 5 fractions of 3D image based intracavitary brachytherapy at a dose of 27.5 Gy.

After completion of her brachytherapy treatment, the patient presented to the Emergency Department with several weeks of edema and pain in her right arm. A right upper extremity ultrasound revealed a 10.8 × 7 cm cystic mass in the right axilla. She was seen for follow-up in the Gynecologic Oncology clinic, at which time her pelvic exam demonstrated a complete clinical response to treatment. She was referred for ultrasound-guided drainage of the axillary fluid collection, which was performed with removal of 1000cc of grossly purulent fluid. Cytology was negative for malignant cells. A PET/CT was then performed for assessment of treatment response and findings were notable for FDG-avidity involving a low-density fluid collection in the right axilla with peripheral activity in small adjacent nodes and enlargement of a low-density cystic lesion in the right gluteal region to 7 cm with FDG-avidity along the periphery [Fig. 2]. At this time, the axillary and gluteal lesions were felt to be inflammatory or infectious given the lack of solid component, the atypical location and the negative cytologic testing.

The patient then re-presented approximately 6 weeks later for generalized weakness and progressive swelling of her axilla. A CT chest demonstrated a large, cystic mass within the axilla, deep to the pectoralis major and lateral to the pectoralis minor measuring 18.3 × 14.9 × 13.3 cm. General Surgery was consulted for assistance with the axillary mass, at which point the patient also began complaining of pain secondary to the right gluteal mass. Aspiration of the right axillary mass and right gluteal mass were performed in the operating room. Cytology from both the right axillary fluid and gluteal fluid aspirates returned positive for malignant cells consistent with necrotic squamous cell carcinoma. A staging CT of the chest, abdomen, and pelvis revealed no evidence of other foci of metastatic or recurrent cervical cancer. The patient was dispositioned to systemic therapy with cisplatin and paclitaxel (bevacizumab was withheld due to a recent deep vein thrombosis), and completed 3 cycles, which she tolerated well. Treatment response was assessed with a CT of the neck, chest, abdomen, and pelvis and was concerning for progression of the metastatic axillary disease. A separate dedicated CT of the right axilla confirmed this finding, and bevacizumab was added to the patient’s fourth cycle of cisplatin and paclitaxel.

During a subsequent admission for pneumonia, the patient reported uncontrolled pain in the right axilla. A CT of the right upper extremity demonstrated an interval decrease in the cystic component of the mass, however with overall progression of the heterogenous mass with extension of disease from the level of the coracoid process to the mid to distal humeral shaft along the course of the short head of the biceps, extension of disease into the right lateral chest wall abutting the lateral margin of the pectoralis major muscle, encasement of the lateral subclavian and axillary arteries, veins, and brachial plexus, occlusion of the right lateral subclavian and axillary veins, and interval progression of the osteolytic lesion at the tip of the right coracoid process with an associated pathologic

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**Fig. 2 –** 18F-FDG PET/CT axial fused image obtained to assess response to therapy 6 months following the initial diagnosis shows an enlarged centrally cystic/necrotic mass with intense peripheral nodular FDG uptake within the subcutaneous fat overlying the right gluteal musculature (white arrow); this corresponds with the site of the formerly small intensely FDG avid gluteal soft tissue mass.
fracture [Fig. 3]. Radiation Oncology was consulted and began palliative external beam radiation therapy to the axillary lesion. The patient completed 7 of 10 cycles of radiation therapy, but during her radiation course developed lethargy, confusion, and an acute decline in her functional status. After a goals of care discussion, the patient was ultimately discharged with home hospice.

**Discussion**

The patterns of metastatic cervical cancer have historically been described based on large autopsy studies. In these studies, distant metastases were most frequently observed in the lymph nodes, lung, bone, liver, and peritoneum.[3,4] However, newer imaging modalities, including FDG-PET/CT, have increased the ability to detect distant sites of metastatic disease. For example, when compared to CT and MRI, FDG-PET has been shown to have improved sensitivity and specificity to detect lymph node metastases in patients with cervical cancer. [5]

Despite advances in radiographic imaging, reported cases of skeletal muscle and soft tissue metastases from cervical cancer remain extremely rare. A literature review by Skenderi et al. in 2017 described only 19 cases of skeletal muscle metastases in patients with cervical cancer.[6] The most common site of metastasis was the psoas muscle, with only rare cases of metastasis to the biceps, masseter, deltoïd, intercostal, buttock, thigh, abdominal, and rectus muscles.[6] Plaza et al. performed a large single-institution review of soft tissue metastases over a 30-year period.[7] In their study, only 118 cases of soft tissue metastases were identified, of which 2 had primary cervical cancer. Both patients had squamous cell carcinoma of the cervix and had metastases identified in the buttock and thigh, respectively.

Our case describes a rare presentation of an isolated soft tissue metastases to the right upper extremity skeletal muscle and the gluteal adipose tissue. Hong and Kim described a similar case of a 70-year-old female with a known history of cervical cancer who presented with a new, painful left axillary mass. [8] The mass was found to be FDG-avid on PET/CT and was surgically excised. Pathologic evaluation confirmed a diagnosis of recurrent, metastatic cervical cancer. Our case was also unique in that the initial evaluation of the cyst fluid did not reveal malignant cells. Padhi et al. presented a case of a 37-year-old female with a history of FIGO stage IIB poorly differentiated squamous cell carcinoma who presented with a painless swelling of the deltoid.[9] Similar to our patient presentation, cytology on the initial drainage of the lesion did not reveal malignant cells. However, when the lesion was excised, malignant cells were detected in the cyst wall and were confirmed to be metastatic squamous cell carcinoma.

**Conclusion**

This case demonstrates the importance of continued evaluation of atypical lesions in patients with a history of malignancy. This case also demonstrates the necessity of continued reporting of unusual sites of metastatic disease as advances in radiologic imaging continue to progress.

**Patient consent**

The patient provided written informed consent for this manuscript and accompanying images. A copy of the written informed consent is available for review upon request from the Editor-in-Chief of this journal.

**CRedit authorship contribution statement**

**Taylor Orellana:** Investigation, Writing – original draft. **Malcolm Ross:** Writing – original draft. **Michael Dressen:** Investigation, Writing – original draft. **Sushil Beriwal:** Conceptualization, Writing – review & editing. **Jessica L Berger:** Conceptualization, Supervision, Project administration, Funding acquisition, Writing – review & editing.
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