An Unusual Case of Pulsatile Leg Swelling: The Lesson Learned

Devender Singh
Department of Vascular and Endovascular Surgery, Yashoda Hospital, Hyderabad, Telangana, India

Abstract

Pulsatile swellings in the leg are uncommon. Almost all the reported cases in the literature are due to the result of an arterial wall injury, presenting as either pseudoaneurysm or aneurysm. A small number of arteriovenous fistulae, vascular malformation, and vascular tumors have also been reported. We report a rare case of pulsating skeletal muscle metastasis from renal cell carcinoma, mimicking as an anterior tibial artery aneurysm. The aim of presenting this case is to highlight the importance of detailed clinical history and need for imaging modalities and to keep the possibility of even remote causes in the initial workup.

Keywords: Aneurysm, metastatic tumor, vascular tumor

INTRODUCTION

A pulsatile swelling in the leg most often raises the possibility of arterial involvement. The most common causes for pulsatile leg swellings are pseudoaneurysms, aneurysms, arteriovenous fistulae, vascular malformations, and vascular tumors. Pulsatile leg swelling due to a metastatic lesion is an extremely rare entity. Due consideration needs to be given during initial assessment, more so when the patient was earlier treated for malignancy. We present this rare case of pulsatile swelling in the left leg which was preoperatively diagnosed as a left anterior tibial artery aneurysm, turned out to be a skeletal muscle metastasis from renal cell carcinoma (RCC). The aim of presenting this case is to highlight the importance of detailed clinical history and need for imaging modalities and to keep the possibility of even remote causes in the initial workup.

CASE REPORT

A 70-year-old man was brought to the emergency with a pulsatile swelling in the lateral aspect of the left upper leg that had been present for 2 months. He was complaining of severe throbbing pain and had disturbed sleep for the last 15 days. His routine activities were grossly hampered as he was not able to put his left leg on the ground. Twenty-five years earlier, he underwent right radical nephrectomy for RCC. He was a known diabetic and hypertensive for the past 15 years. Three years back, he was diagnosed to have coronary artery disease and underwent percutaneous transluminal coronary angioplasty for the right coronary artery. On physical examination, the patient had 12 cm × 6 cm firm, pulsatile swelling in the anterolateral aspect of the left upper leg [Figure 1]. The swelling was nontender and appeared mobile. The overlying skin was stretched and tethered, suggestive of a prerupture state. The temperature over the swelling was raised, and there was a bruit on auscultation. His leg pulses were palpable. Neurological examination of the leg could not be appreciated as he was in distress. Hematological and biochemical studies revealed hemoglobin of 5.8 g% and creatinine of 3.4. The swelling had been subjected to fine needle aspiration cytology at some other centers before the patient presented to us, which revealed blood. He underwent color duplex examination, which suggested a hypervascular mass suggestive of left anterior tibial artery aneurysm. In view of severe pain, prerupture state of swelling, and a clinical diagnosis of left anterior tibial artery aneurysm (supported by color duplex), he was planned for an emergency surgery. On exploration, there was a large hypervascular, 10 cm × 4 cm firm mass between the muscle bellies, along the neurovascular bundle. All the muscles were edematous and stretched. There were multiple feeders from anterior tibial artery and perforating vessels. The patient underwent wide local excision of the mass sparing neurovascular bundle. At this point in time, we

Address for correspondence: Dr. Devender Singh, E-mail: drdevendersingh@hotmail.com

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made a diagnosis of either a vascular tumor or a nerve sheath tumor. The surgical specimen was sent for histopathological examination for confirmation [Figure 2]. The patient’s postoperative recovery was uneventful. He was ambulant from the next day of surgery and had no neurological deficit. The final assessment of the surgical specimen led to a diagnosis of metastatic RCC [Figure 3]. The patient was referred to an oncologist for further evaluation and treatment.

**Discussion**

Pulsating mass located close to peripheral arteries is usually considered as a result of arterial wall injury. The most common causes in the leg are pseudoaneurysms, aneurysms, arteriovenous fistulae, vascular malformations, and vascular tumors. In very extreme cases, one should not forget pulsating metastatic lesions, more so in a patient earlier treated for malignancy. In our case, we missed the diagnosis due to lack of detailed history taking and clinical examination, and so, we did not work up for other metastatic disease from RCC. RCC reportedly has widespread and unpredictable metastatic potential even after curative nephrectomy is performed. It is the most unusual and unpredictable cancer. Like tuberculosis and syphilis, it is one of the great mimics in the clinical medicine. Recognizing the unusual presentation and natural history of RCC can have a profound effect on patient’s management and thus on morbidity and mortality.

Distant metastasis is common in RCC; nearly one-fourth of the patients have metastasis at presentation while another 50% develop metastasis during follow-up. The most common sites of RCC metastases are the lymph nodes, lungs, bones, liver, and brain. Although RCC can metastasize to virtually any site, metastases to the skeletal muscle are unusual. Skeletal muscle is a rare site for metastases. Autopsy series show variable incidences of metastases from any primary tumor to skeletal muscles, but rates generally range from 1% to 6%. Many of these metastases are microscopic and not readily detectable. Primary tumors that most often spread to the skeletal muscles are carcinomas of the breast, colon, or lung. Primary soft tissue tumors are more common than the rare skeletal muscle metastases; therefore, the possibility of these metastases is often ignored in the initial diagnosis of a soft tissue mass. In our knowledge, very few patients with skeletal muscle metastases from RCC have been described. In several autopsy series, about 0.4% of patients with RCC had skeletal metastases. However, the true incidence is difficult to determine because patients with skeletal muscle metastases may have painless, enlarging mass lesions, and the lesions may not be detected when they are small. Because of the rarity of these metastases, the differential diagnosis of metastasis from RCC might be overlooked when one encounters a mass lesion in the skeletal muscle. However, this possibility should be always considered. Moreover, RCC may behave in a highly variable manner. McNichols et al. reported that 11% of metastatic RCC cases occurred more than 10 years after initial diagnosis even after complete resection of early-stage RCC. In other words, patients treated for RCC are always at risk for delayed metastatic disease, and RCC metastases must be differentiated from benign soft tissue tumors because aggressive surgical resection may be beneficial. Pulsatility is due to hypervascularity in the tumor.

Figure 1: Pulsating swelling anterior-lateral aspect of the left upper leg

Figure 2: Surgical specimen

Figure 3: Histopathological examination suggestive of metastasis renal cell carcinoma
because of arteriovenous fistulae. This is seen in few cases and easily mistaken for an aneurysm or a vascular tumor. This has also happened in our case. Color duplex confirms the hypervascular nature of the tumor as well as the presence of an arteriovenous shunt, a minor characteristic of malignancy.\[9\] However, if not done carefully with detailed patient history, one can give a false diagnosis of an aneurysm, as happened in our case. Further confirmation is must with angiography and magnetic resonance imaging (MRI). Angiography typically shows hypervascular masses, which may have an arteriovenous shunt.\[9,10\] T2-weighted MR images may show high signal intensity.\[3,9,10\] Surgical resection of metastatic RCC reportedly improves the outcomes of patients with metastatic RCC. Five-year survival rates are between 35% and 50% after surgical therapy for solitary metastasis.\[3,9\] Therefore, it is important to diagnose it before exploration so that proper surgery can be planned.

**Conclusion**

The presence of a pulsatile mass in a patient with a history of RCC should alert the clinician to the possibility of skeletal muscle metastases. Proper imaging modalities such as color duplex, angiography, and MRI can help in distinguishing skeletal muscle metastases from other vascular causes as well as in planning proper surgical resection.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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