A ‘Hot’ Leg: A Rare Case of Isolated Long Bone Metastases from Cervical Cancer

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Abstract. A 70-year-old woman with a past medical history of FIGO stage IIIA cervical cancer presented with severe pain in her right leg and after investigations was found to have isolated metastases within the right tibia, fibula and calcaneum. Bone metastases from cervical cancer are relatively rare and tend to occur in the spine and pelvis. There are only a handful of case reports of isolated long bone metastases from cervical cancer in the literature. This case highlights the importance of diagnostic imaging and the role of histological confirmation when there is diagnostic uncertainty.

In the UK, there are around 2,800 new cases of cervical cancer diagnosed in each year. Overall, cervical cancer incidence rates in Britain have almost halved in the last 20 years with the introduction of screening, however, cervical cancer still accounts for 10% of all cancers diagnosed in women worldwide (1).

Patients with cervical cancer are at risk of developing pelvic recurrence, distant metastasis, or a combination of both. The risk of recurrence is higher in patients with more advanced disease at presentation and the majority of recurrences occur within 2 years of diagnosis (2). Control of the primary tumour is thought to be associated with a lower incidence of distant metastasis (3).

In patients who develop distant metastasis, the most frequently observed metastatic sites are lung, para-aortic nodes, the abdominal cavity, and supraclavicular nodes. Bone metastasis in patients with cervical cancer are relatively rare, but have a significant clinical impact. The reported rates of bone metastasis vary and have been reported between 1.9-16% (2, 4-6). Bone metastases tend to predominantly involve the lumbar spine and pelvic bones. Radio-isotopic bone scans are not routinely used in the staging of cervical cancer unless clinically indicated by patients’ symptoms.

Case Report

The case of a 70-year-old woman previously treated for a FIGO stage IIIA squamous cell carcinoma of the cervix who subsequently developed isolated bone metastases in her tibia and fibula is presented.

The patient initially presented with postmenopausal bleeding and was referred for investigation. Vaginal examination revealed a large cervical tumour and staging investigations confirmed a FIGO stage IIIA squamous cell carcinoma of the cervix. The patient had a past medical history of ischaemic heart disease and had undergone a coronary artery bypass graft 5 years previously. At presentation, the patient had a good performance status and was living independently, able to perform everyday activities.

The patient was treated radically with combination chemoradiation, receiving 50.4 Gy in 28 fractions of external beam radiotherapy to her pelvis, 45 Gy in 25 fractions external beam radiotherapy to the para aortic area and 14 Gy in 2 fractions of intra cavity brachytherapy. The radiotherapy was given with weekly concurrent cisplatin 40 mg/m². The patient tolerated the treatment well and repeat imaging showed a good response to treatment.

Four months after completing treatment, the patient began to complain of severe pain in her right leg which began to limit her mobility. She denied any systemic symptoms. Destruction of the tibia and fibula could be seen on X-ray examination, raising an initial suspicion of metastatic disease or osteomyelitis (Figure 1). The pain increased and the patient became unable to bear weight and was therefore admitted to hospital for further investigations. Blood tests, including corrected calcium levels, were all within normal limits. A whole-body scintigraphy bone scan showed intense uptake in the right tibia and fibula, with involvement of the calcaneum but no other focus of disease (Figure 2). The reporting radiologist coined the phrase ‘a hot leg’ and was initially suspicious that the findings represented chronic osteomyelitis. A magnetic resonance imaging (MRI) scan of the leg showed extensive lesions identified in the tibia which had replaced most of the diaphysis of the tibia (Figure 3). There were also lesions...
within the fibula and calcaneum. The differential diagnosis at this point included lymphoma or metastasis.

Restaging chest, abdomen and pelvis computerised tomography (CT) scans showed no evidence of lung or liver metastasis, however, a pelvic MRI scan showed progression of the disease within the cervix. The patient underwent a CT-guided biopsy of the lesion in the bone which showed metastatic squamous cell carcinoma consistent with her original cervical tumour.

The case was discussed with the orthopaedic team who agreed that surgical intervention was not possible due to the degree of involvement of the anterior cortex. The patient was fitted with an above knee cast and was treated with palliative radiotherapy to the right tibia and fibula. The radiotherapy was CT planned and the treatment covered the extent of visible disease. The patient received 30 Gy in 10 fractions over two weeks. The radiotherapy significantly improved her pain and she was subsequently able to mobilise with a frame.

**Discussion**

Several patterns of bone metastasis have been observed: (i) direct extension into bone from the parametrial extensions of the primary or recurrent pelvic tumour, (ii) direct extension into bone from parenchymal metastasis to distant lymph nodes or lung, (iii) regional haematogenous metastasis compatible with Batson's venous plexus distribution, and (iv) systemic haematogenous metastasis to distant bones.

Investigations for suspected bone metastasis include X-ray, CT and whole-body scintigraphy (bone scan). More recently MRI and 18fluorodeoxy glucose positron emission tomography (PET) in combination with CT (PET/CT) are being increasingly used in such circumstances. Both MRI and PET are considered to have high sensitivity for detecting bone marrow or osteolytic bone metastasis. Because haematogenous bone metastasis is considered to start in the bone marrow, and the majority of metastatic bone lesions in cervical cancer seem to be of an osteolytic nature, both MRI imaging and PET may facilitate the detection of bone metastasis.

Bone metastasis is associated with a poor prognosis and treatment decisions should be based on the performance status of the patient, the site of recurrence and/or metastases, the extent of metastatic disease, and prior treatment.

Local treatment with external beam radiotherapy to sites of symptomatic involvement in patients with metastatic disease has an important role to play in pain control. Bone pain responds to external beam radiotherapy in 60-70% of cases. Response can take 4-6 weeks, therefore it is
important to assess patients’ prognosis before arranging radiotherapy. A number of randomised controlled trials have reviewed the most appropriate dose and on the basis of these the current recommendation of uncomplicated bone pain is a single 8 Gy fraction (10). Patients should be referred to community palliative care teams if pain is an ongoing issue.

In the literature, there are only a few case reports of isolated bone metastases in long bones: one reported the case of an isolated recurrence in the femur and another, the case of an isolated metastasis in the fibula (11, 12).

The patient in this case study had isolated disease in the right tibia and fibula which appeared to extend proximally across the joint and distally into the calcaneum. These metastases are likely to have occurred through haematogenous spread and this raises an interesting question as to the predilection for the long bone in this case.

The case highlights the importance of diagnostic imaging and the obtaining of a histological confirmation whenever there is uncertainty over diagnosis. The differential diagnosis of the ‘hot leg’ in this case ranged from chronic osteomyelitis to lymphoma. Therefore, making an appropriate diagnosis was paramount to instigating appropriate management for this patient.

References

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Figure 3. MRI of lower leg.