CASE REPORT

Bilateral acrometastasis in a case renal cell carcinoma

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SUMMARY

We present a unique case of bilateral skeletal metastasis below the knee in a patient with renal cell carcinoma. In this rarest of rare cases, bony metastases were the first presentation of a primary tumour. Incidentally, the primary tumour (renal cell carcinoma) involved the solitary kidney of the patient and the same patient also had coexisting carcinoma of the prostate.

BACKGROUND

The skeleton is one of the most common sites of metastatic disease, ranking after the lungs and liver. In total, 80% of all skeletal metastases come from prostate, breast, kidney, lung and thyroid cancers.¹ In the musculoskeletal system, the femur, spine, humerus, pelvis, ribs and skull are the most commonly affected sites, in that order.^{2–4} Metastases are extremely rare distal to the knee and elbow⁵ and are known as acrometastasis. Bilateral involvement of acrometastasis in an individual is not reported in the literature, to the best of our knowledge. If the lesion is distal to the elbow or knee, lung cancer is reported to be the most likely primary lesion.^{6–7} Usually, lower limb metastasis below the knee indicates a very poor prognosis and is indicative of severely widespread metastatic disease with a fatal outcome.^{8–9} We present a rare case of bilateral lower limb metastasis, distal to the knee, with an undiagnosed primary lesion that was later diagnosed to be renal cell carcinoma (RCC) in a solitary kidney.

CASE PRESENTATION

A 70-year-old man, a known case of carcinoma of the prostate, presented with fever, cough and swelling, and pain in both legs of 4–5 days duration. On examination, there was diffuse swelling around both knees with tense, shiny and red skin (figure 1). Both his knees were in an attitude of flexion and had prominent dilated veins (figure 2). The swellings were warm, tender and firm-to-hard in consistency. Range of motion was absent in the right knee and complete but painful in the left knee. He also had left foot drop.

The patient had a history of adenocarcinoma of the prostate for which orchiectomy was performed 1 year prior. Initially, there was clinical suspicion of metastasis from the prostate. But the PSA and the uptake in PET CT were found to be normal.

INVESTIGATIONS

X-ray of the right knee revealed a large, destructive lesion involving the proximal tibia (figure 3) with a pathological fracture. There was destruction of the articular surface as well. On the left side

there was an expansile lytic lesion of proximal fibula with complete destruction of the bone (figure 4), with involvement of surrounding soft tissue.

Trucut biopsy was taken from the fibular lesion. Sections revealed cores of tumour tissue, comprised of cells arranged as nests of small islands, separated by a rich sinusoidal vascularity. Individual cells were large, with well-defined margins and ample, clear cytoplasm (figure 5). Immunohistochemistry showed positivity for pancytokeratin and vimentin. The morphology and immune profile was consistent with metastasis from a primary RCC, clear cell type.

Whole body PET/CT scan was performed, which showed a rounded mass with mild peripheral enhancement in the anterolateral cortex of the lower pole of the left kidney (figure 6), suggestive of RCC. The right kidney was not visualised anywhere in the abdomen, suggesting agenesis. Hypermetabolic bilateral adrenal mass lesions, multiple lung nodules and left fibular and right tibial lesions with associated soft tissue component were seen (figure 7), indicative of metabolically active metastatic disease.

Figure 1 Flexion deformity of the right knee with swelling over proximal tibia and markings for radiotherapy.

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Figure 2 Side view of the right knee.

TREATMENT

The patient was started on analgesics and radiotherapy. A foot drop splint was applied on the left foot. He received 12 cycles of palliative radiotherapy.

OUTCOME AND FOLLOW-UP

Unfortunately, the patient died of multiple organ failure and septicaemia 3 months after the onset of leg swellings.

DISCUSSION

Despite their rarity, metastases distal to the knee are of concern because they may be the first manifestation of an occult cancer, or they may mimic other skeletal diseases and be confused with

Figure 4 Anteroposterior view of the left knee showing expansile lesion involving the proximal fibula.

Figure 3 Lateral radiograph of the right knee showing pathological fracture of proximal tibia.

them, leading to improper treatment. In addition, when they cause pain prior to the appearance of a radiographic abnormality, they may signify the imminent appearance of more widespread metastasis. Recent literature has shown that in such cases lungs might not be the only primary source, as earlier thought. In such cases, primary from the other sites such as the lung, breast^{7 8} or, as in our patient, kidney, should be suspected. RCC may be difficult to diagnose initially, as a majority of patients

Figure 5 Histopathology of the lesion suggestive of metastasis from renal cell carcinoma.

Figure 6 Positron emission tomography/CT scan confirming the left renal involvement.

(29–57%) of RCC might have already developed metastases when the first diagnosis is made. Solitary bony metastasis is found only in 0.7% and 2% of these cases.⁹ The common sites of metastases with RCC are the lung (75%), liver and bone (40% each), soft tissues (34%) and pleura (31%).¹⁰ The most commonly involved bones are of the pelvis and femur. Sternum, scapula, and small bones of feet and hands may also get affected. However, involvement of the tibia and fibula is extremely rare. The metastases from RCC are usually highly vascular and hence are lytic and expansile. These lesions may present with severe pain, neurological compromise and sometimes with pathological fracture.¹¹ These tumours often have unpredictable response to radiotherapy and chemotherapy, thus carrying a bad prognosis. Metastases below the knees are mostly associated with poor outcome, and this was also true in our case. We believe that the metastasis below the knee often spells out a ‘death warrant’ to these patients, due to its association with widespread metastasis and poor prognosis. Multiple bony metastases, a combination of bone and other organ involvement carries a poor prognosis as compared with a solitary bone lesion, which has a better prognosis.¹² Very few cases of metastasis below the knee have been reported. De Geeter *et al*¹³ reported four cases with metastatic tibial fractures. In two of them, primary was from the breast, one from the endometrium

and one from the kidney. Two cases of colorectal carcinoma metastasising to the tibia have been reported.^{14 15} Kundu *et al*⁵ reported a case with below knee and below elbow metastasis with primary from the breast. Tibial metastasis from the lung and kidney have also been reported.^{16 17} Metastasis to the fibula has been reported from the genital tract,^{18–21} gastrointestinal tract,²² lungs²³ and kidney.²⁴ However, to our knowledge, bilateral below knee metastases have never been reported.

Learning points

- ▶ Bony metastasis distal to the knee and elbow (acrometastasis) is extremely rare.
- ▶ It usually indicates a very poor prognosis.
- ▶ Awareness about acrometastasis is important to reach a prompt diagnosis.

Competing interests None.

Patient consent Obtained.

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Figure 7 Bilateral lower limb involvement (below the knee) of metabolically active metastasis.

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