Case Report

Evaluation of bone metastasis as the first presentation of hepatocellular carcinoma using 18-fluorodeoxyglucose positron emission tomography-computed tomography

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ABSTRACT

We report a case of a patient with hepatocellular carcinoma (HCC) who presented with back pain related to bone metastasis. HCC metastasizes by hematogenous and lymphatic routes commonly to the lungs, regional lymph nodes, kidney, bone marrow and adrenals. In this extremely rare case, the patient had no known liver disease, but presented with liver lesions and multiple bone lesions involving vertebrae, ribs, pelvic bones and left femur with associated expansile soft-tissue components. These bone lesions were first detected from a positron emission tomography scan. Pathological examination of biopsy material taken from the left eighth rib confirmed metastatic HCC. In conclusion, if a patient has expansile osteolytic bone lesions, bone metastasis from HCC should be included in the differential diagnosis.

Keywords: Bone metastasis, fluorodeoxyglucose, hepatocellular carcinoma, positron emission tomography

INTRODUCTION

Ultrasound, computed tomography (CT), magnetic resonance imaging and positron emission tomography (PET) are the primary imaging methods for the diagnosis of liver cancer. 18F-fluorodeoxyglucose-PET/CT (18F-FDG-PET/CT) detects malignant disease based on increased utilization of glucose by cancer cells. In this case report, we document a patient with hepatocellular carcinoma (HCC) who presented with bone pain related to bone metastasis detected by 18F-FDG-PET/CT. Bone was found to be the only site of metastasis.

CASE REPORT

A 75-year-old man presented with left thoracolumbar pain that he had for 3 weeks to internal medicine out-patient department in Ataturk University School of Medicine, Erzurum at Turkey. He had no history of previous injury. The patient did not have clinical symptoms of systemic diseases, such as malaise, weight loss or fever. Physical examination revealed local tenderness over the left iliac crest. Abdominal, respiratory, cardiovascular and neurological examinations were normal. An abdominal ultrasound showed that the liver was enlarged and that there were multiple echogenic lesions in the right lobe of the liver with varying diameters between 1 and 4 cm. The images suggested malignant lesions, either metastasis or HCC. Blood tests showed a high α-fetoprotein (AFP) level (50,000 IU/ml; normal range, <5.8 IU/ml). The PET/CT images showed focally increased 18F-FDG uptake in liver segments V and VII. In addition, multiple foci of increased 18F-FDG uptake in lytic bone lesions involving the vertebrae, ribs, pelvic bones and left femur with associated soft-tissue components were seen [Figure 1]. A pathological examination of biopsy material taken from the left eighth rib confirmed metastatic HCC [Figure 2].

DISCUSSION

The most frequent location for metastatic HCC is the lung, followed by the lymph nodes and bone. The most common site of bone metastasis is the spine, followed by the ribs, pelvis and femur. Bone metastasis from HCC is not uncommon, but the first presentation as bone metastasis is rare.[1] The most common differential diagnosis of expansile osteolytic bone metastasis includes renal cell carcinoma and thyroid carcinoma. HCC bone

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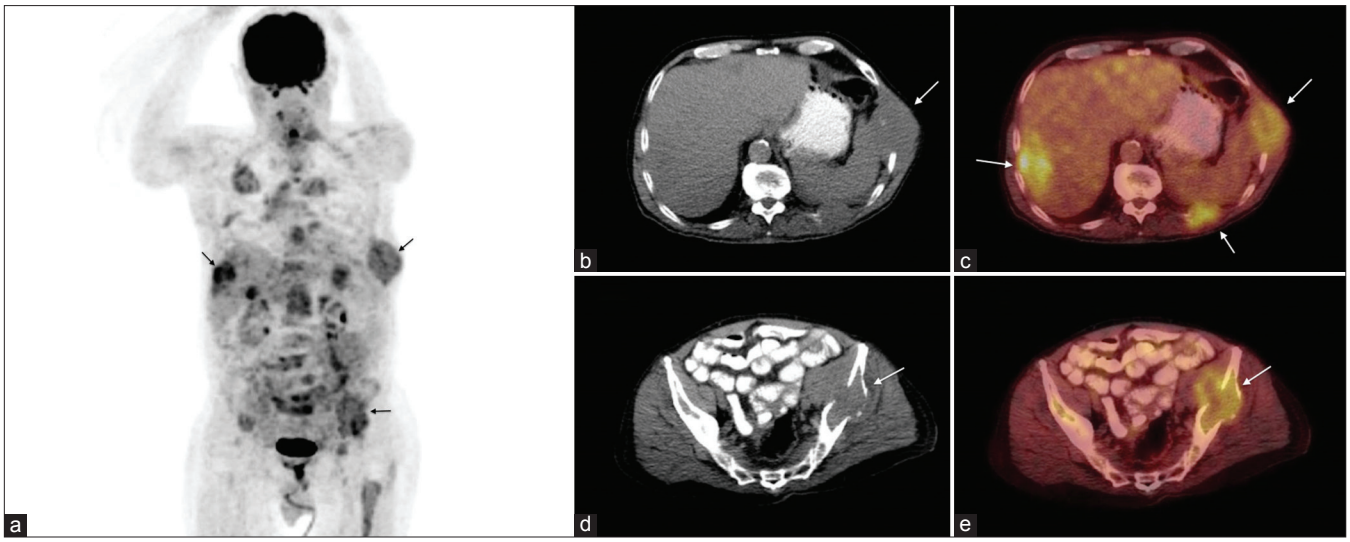

Figure 1: 18F-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG-PET/CT) scan in a 75-year-old male diagnosed with hepatocellular carcinoma. A maximum intensity projection image (a) Showed intense 18F-FDG uptake in the right lobe of the liver. Additionally, 18F-FDG uptake was noticed in multiple bone lesions, indicating the presence of distant metastases. (b) On a transaxial noncontrast CT image as part of the 18F-FDG, FDG-PET/CT revealed bone metastasis with well-marginated soft-tissue masses involving the left eighth and eleventh ribs. (c) Hypermetabolism in the left eight and eleventh ribs are well visualized on the fused PET/CT. Increased 18F-FDG activity is seen in liver segment VII. (d) Non-contrast CT images revealed bone metastasis involving the left iliac crest. (e) Hypermetabolism in the left iliac crest is well visualized on fused PET/CT

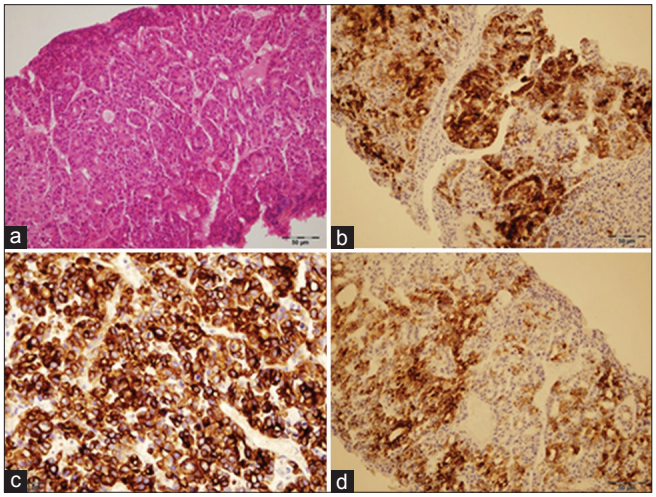

Figure 2: (a) Histological features show tubular (acinar, pseudoglandular) and trabecular patterns with intervening sinusoids (H and E, ×200). The key to the identification of hepatocellular carcinoma is its resemblance to hepatocytes, the presence of more than 2-3 cell-thick hepatocellular plates/cords, nuclear atypia and absence of portal tracts. The tumor cells were immunopositive for (b) hepatocyte paraffin 1 monoclonal antibody (×100), (c) cytokeratin 18 (×400) and (d) α-fetoprotein (×200)

metastasis is rarely included in the list of differential diagnoses.[2] A unique characteristic of bone metastasis from HCC is the soft-tissue formation (85%).[3] In this case study, PET/CT images demonstrated metastatic bone lesions with an associated soft-tissue component. A PET/CT scan is an important and valuable imaging tool for distant metastases in patients with unexplained elevated AFP. Metastasis to the bones occurs through portal vein–vertebral vein plexuses, thus explaining the more frequent craniospinal and pelvic bone metastases.[4] In this patient, a very high AFP was detected and there were multiple vertebral, rib and pelvic bone lesions. HCC patients who present with "bone-only" metastasis are said to have a better prognosis and all these patients need to be offered chemotherapy plus at least one of the bone-directed therapies, either local radiation (in localized disease) or bisphosphonates (in extensive disease).[5]

In conclusion, we suggest that the use of the whole body 18F-FDG-PET/CT should be considered in the follow-up of patients with HCC, especially if they have an unexplained elevated AFP, so as to detect systemic metastases as early as possible.

REFERENCES

1. Kim SU, Kim do Y, Park JY, Ahn SH, Nah HJ, Chon CY, *et al.* Hepatocellular carcinoma presenting with bone metastasis: Clinical characteristics and prognostic factors. J Cancer Res Clin Oncol 2008;134:1377-84.
2. Dahnert W. Radiology Review Manual. 6th ed. Philadelphia: Lippincott Williams and Wilkins; 2007.
3. Fukutomi M, Yokota M, Chuman H, Harada H, Zaitsu Y, Funakoshi A, *et al.* Increased incidence of bone metastases in hepatocellular carcinoma. Eur J Gastroenterol Hepatol 2001;13:1083-8.
4. Ahmad Z, Nisa AU, Uddin Z, Azad NS. Unusual metastases of hepatocellular carcinoma (hcc) to bone and soft tissues of lower limb. J Coll Physicians Surg Pak 2007;17:222-3.
5. Attili VS, Babu KG, Lokanatha D, Bapsy PP, Ramachandra C, Rajshekar H. Bone metastasis in hepatocellular carcinoma: Need for reappraisal of treatment. J Cancer Res Ther 2008;4:93-4.

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