

Dural Metastasis in Spinal Canal Diagnosed on F-18 Fluorodeoxyglucose Positron Emission Tomography Contrast-Enhanced Computed Tomography Scan in Treated Case of Osteogenic Sarcoma of the Left Femur

Abstract

We describe a rare case of osteogenic sarcoma of the right femur; who 2 years after the treatment of primary site developed dural metastasis. Surveillance imaging for unusual pattern of metastasis may lead to earlier detection and treatment decision-making, which may improve survival and quality of life.

Keywords: Extradural metastasis, extra-pulmonary recurrence, fluorodeoxyglucose positron emission tomography computed tomography, osteogenic sarcoma, spinal canal metastasis

Introduction

Osteogenic sarcoma (OGS) is the most common nonhematologic primary malignancy of the bone. The peak incidence occurs in the second decade of life, and the metaphyseal part of long bones is the site most frequently involved.^[1] The initial staging workup for OGS includes magnetic resonance imaging (MRI) for locoregional extent of disease and computed tomography (CT) with methylene diphosphonate Methylene Diphosphonate (MDP) bone scan to rule out pulmonary and distant skeletal metastases. However, no proper imaging modality is so far recommended for restaging in cases of OGS. As we know, F-18 fluorodeoxyglucose positron emission tomography/CT (FDG PET/CT) is commonly used for the evaluation of distant metastases in known cases of malignancy. Whole-body protocol of FDG PET/CT scan and increased GLUT expression of these lesions can be used to identify unexpected sites of metastases or relapse in treated cases of OGS. Here, we are presenting one such case with unusual dural site of metastasis in treated case of OGS, which was picked up on F-18 FDG PET/CT scan done for restaging.

Case Report

A 16-year-old boy was diagnosed with the left femur OGS in December 2018. Initial treatment was resection of the primary tumor with total knee replacement and adjuvant chemotherapy. He underwent surgery for local resection followed by adjuvant chemotherapy. Thereafter, he remained disease-free until September 2020 when he presented with complaints of low back pain and weakness in both legs which were gradually worsened, and he became unable to walk. He also complained of numbness and tingling sensation in the anterior aspect of both thighs. He had also bladder and bowel disturbance. On local examination, no obvious swelling was found; however, tenderness was present over the left gluteal region. On neurological examination: Tone was decreased bilaterally; muscle power was Grade 3 in all muscle groups of the lower extremity. Anal tone was intact. All other systemic examination reveals normal. All these clinical findings raised suspicion of vertebral metastases. To look for this vertebral recurrence and also to rule out any other sites of metastases or relapse we decided to do F-18 FDG PET/contrast-enhanced computed tomography scan in this patient. Whole-body screening

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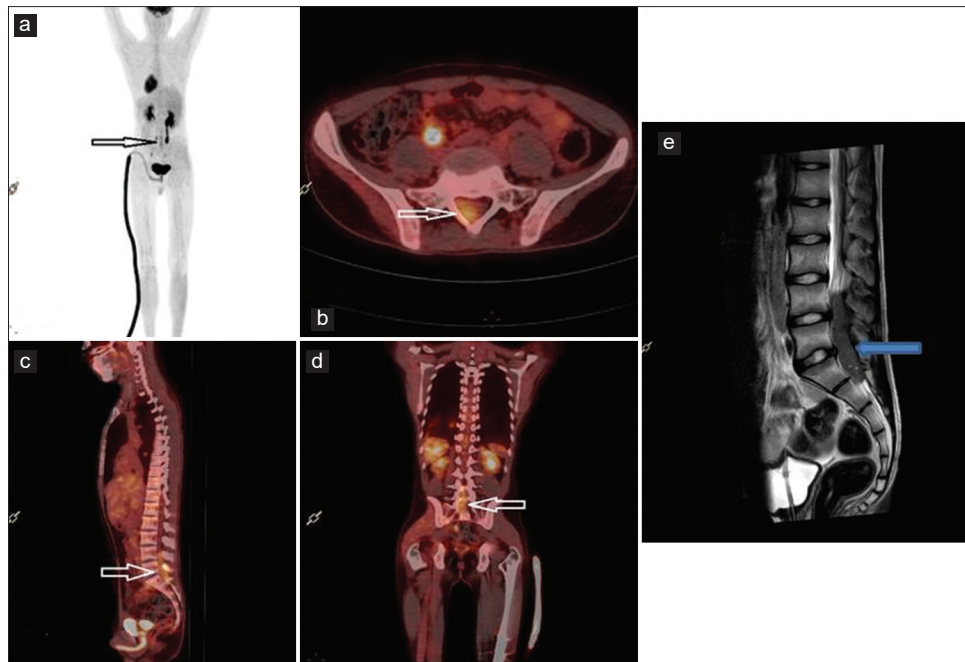


Figure 1: In maximum intensity projection image (a), linear fluorodeoxyglucose uptake is seen as shown with arrow which is correlating with the fused fluorodeoxyglucose positron emission tomography computed tomography axial, sagittal, and coronal images (b-d respectively)

of F-18 FDG PET/CT scan showed localized disease in the spinal canal at lumbar level with no other sites of metastases or relapse. Maximum intensity projection image showed linear tracer uptake along the spinal canal at the level of lumbar vertebrae [Image 1A]. Axial, coronal, and sagittal fused PET/CT images confirmed increased FDG uptake in ill-defined dural soft tissue mass in the spinal canal extending from L3 to S1 vertebrae with no bony involvement, SUVmax 4.13 [Figure 1b-d]. MRI done thereafter confirmed the location. In view of localized disease, curative intent was planned. The patient underwent emergency decompression surgery followed by adjuvant chemo and radiation therapy. Histopathology of the specimen revealed high-grade sarcoma composed of round and spindly cells with areas of osteoid formation compatible with metastatic osteosarcoma.

Discussion

Osteosarcoma is the most common malignant tumor of bones. The peak incidence occurs in the second decade of life and the metaphyseal part of long bones is the site most frequently involved.^[1] Classical high-grade osteosarcoma of the extremity has more tendency for recurrence as depicted in our case. The lung is the most common site of metastatic disease; however, extrapulmonary sites are increasingly affected in treated patients. This may be because of changes in the natural history of the disease by multi-agent chemotherapy or longer survival times of these patients.^[1,2] In fact, the most commonly affected extrapulmonary site is the skeletal system followed by the brain, liver, pelvis, and soft tissues.^[1]

In our case, it is dural metastasis in the spinal canal. We did not find any literature for dural metastases in treated cases of OGS and also primary OGS arising from the meninges are very uncommon tumors and to our knowledge, only five cases have been cited in the modern literature.^[3] Primary OGS arising from the spine represents 3.6%–14.5% of primary spinal tumors and 0.85%–3% of all osteosarcomas.^[4]

Despite resection and chemotherapy, 30%–40% of patients with the localized disease will experience relapse, usually within 3 years.^[5] In our case, the patient experienced relapse 2 years posttreatment. Once this happens, the overall survival ranges from 13%–57%.^[2,6]

Overall survival and intent of treatment whether curative or palliative depends on the site of relapse and also the extent of disease. However, most surveillance protocols including MRI or CT scan after primary resection of osteosarcoma do not involve whole-body screening missing these atypical sites of metastases. In our case, FDG PET/CT scan was done for restaging, which revealed solitary site of disease recurrence confirming the curative intent of treatment.

Thus from the above case, we can surely say that FDG PET/CT has incremental value in these cases providing the whole-body screening and high sensitivity for the detection of these unusual metastatic sites.

Informed consent

Informed consent was taken from the patient for the publication of this case report and related images and histopathological data.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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