

## Unusual Case of Neuroblastoma with Only Growth Plate Metastasis in Bilateral Lower Limbs on Metaiodobenzylguanidine Scintigraphy

### Abstract

Neuroblastoma is the most common extracranial solid tumor in childhood developing from primitive neural crest cells. I-131-metaiodobenzylguanidine (MIBG) a norepinephrine analog is highly sensitive and specific to identify primary and distant metastatic sites. We report the case of a 2-year-old female child with progressively increasing abdominal distention. Computed tomography (CT) revealed a large mass lesion involving the right suprarenal region with no hepatic or lymph node metastasis. No obvious skeletal abnormality was detected on the whole-body skeletal survey and Tc-99 m-methylene diphosphonate bone scan to suggest metastasis. I-131-MIBG scintigraphy with single-photon emission computerized tomography-CT showed MIBG-avid primary tumor in a suprarenal location with bilateral lower limbs growth plate as the only site of metastasis.

**Keywords:** Growth plate metastasis, I-131-metaiodobenzylguanidine, neuroblastoma, Tc-99 m-methylene diphosphonate bone scan

Neuroblastoma is a third common pediatric tumor arising from primitive neural crest cells of the sympathetic ganglion.<sup>[1,2]</sup> It is an aggressive tumor with the propensity to metastasize to lymph nodes, bone marrow, cortical bone, and liver.<sup>[3,4]</sup> Tc-99 m-methylene diphosphonate (MDP) bone scan is not routinely advised in the evaluation of neuroblastoma.<sup>[5]</sup> It can be useful in patients with nonmetaiodobenzylguanidine (MIBG) avid primary tumor and in patients for whom the primary tumor has been excised. One of the common pitfalls described in neuroblastoma on Tc-99 m-MDP bone scan is the blurring of growth plates with the extension of radiotracer uptake in the metaphyseal region in growing bones. In the pediatric age group, this can obscure the underlying skeletal metastasis.<sup>[6,7]</sup> On the other hand, radioiodine-labeled MIBG imaging is considered as the mainstay in the management of neuroblastoma because of its high sensitivity and specificity.<sup>[7-10]</sup> It is useful in detecting primary as well as

metastatic sites. Although bone marrow/skeletal metastasis is common in neuroblastoma, the involvement of only lower limb growth plates without any other sites of metastases is unusual. In our case, there was no definite skeletal involvement on the Tc-99 m-MDP bone scan, whereas the I-131-MIBG scan showed metastases only to the bilateral lower limb growth plates without other metastatic sites [Figure 1]. To the best of our knowledge, not much data are available in the literature with only growth plate metastasis in neuroblastoma. This unusual presentation of neuroblastoma emphasizes the importance of critical evaluation of Tc-99 m-MDP bone scan in the pediatric population with asymmetrical radiotracer uptake at growing bones and it also reiterates the undisputed role of I-131-MIBG scan in the evaluation of neuroblastoma.

### Financial support and sponsorship

Nil.

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**Received:** 20-02-2021

**Revised:** 14-03-2021

**Accepted:** 24-03-2021

**Published:** 23-09-2021

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**How to cite this article:** Yadav N, Taywade S, Kumar R, Prashanth A. Unusual case of neuroblastoma with only growth plate metastasis in bilateral lower limbs on metaiodobenzylguanidine scintigraphy. Indian J Nucl Med 2021;36:346-7.

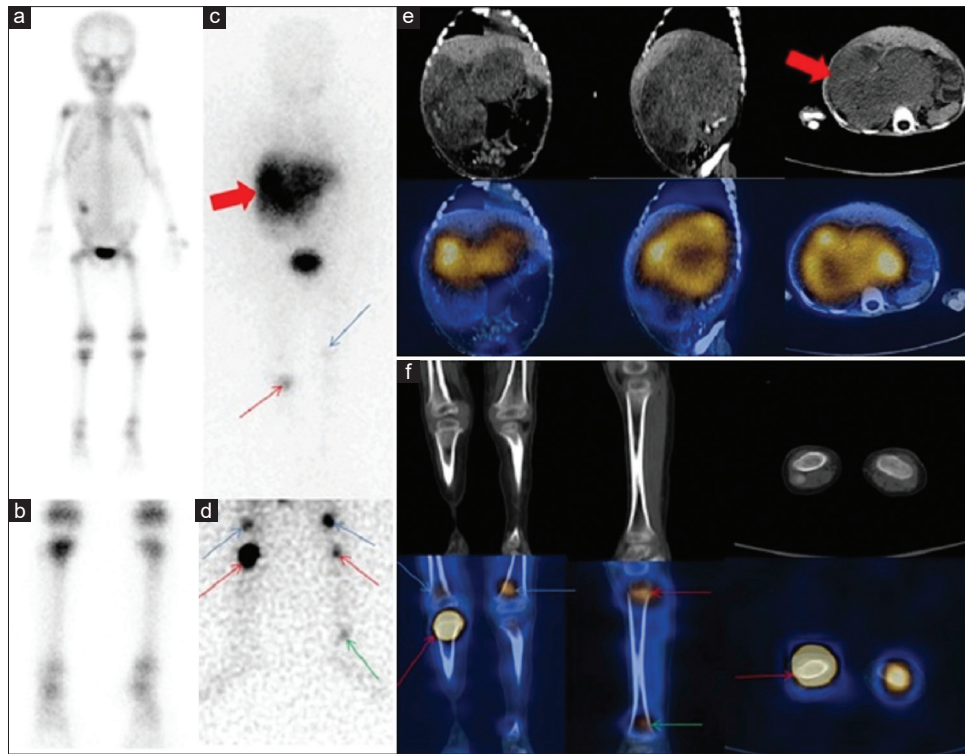
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**Website:** www.ijnm.in

**DOI:** 10.4103/ijnm.ijnm\_24\_21

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**Figure 1:** (a) Anterior view of whole-body Tc-99 m-methylene diphosphonate bone scan showed no skeletal metastasis. However, there was asymmetrical uptake in growth plates in the bilateral tibia with no significant metaphyseal extension (b). The patient subsequently underwent I-131-metaiodobenzylguanidine scan. (c) Anterior view images of whole-body I-131-metaiodobenzylguanidine scan demonstrated heterogeneous radiotracer uptake in the abdomen predominantly on the right side and crossing the midline (thick red arrow). Faint radiotracer accumulation also noted in the lower end of the left femur (blue arrow) and upper end of the right tibia (thin red arrow). (e) Abdomen single-photon emission computerized tomography-computed tomography images revealed large metaiodobenzylguanidine avid heterogeneous mass lesion (thick red arrow) with areas of calcification in the right suprarenal location crossing the midline, closely abutting and compressing the liver and infiltrating the right kidney. The right suprarenal gland was not seen separately from the mass. I-131-metaiodobenzylguanidine lower limbs spot view (d) and single-photon emission computerized tomography-computed tomography (f) showed heterogeneous metaiodobenzylguanidine concentration in the lower end of the bilateral femur (blue arrow), upper end of the bilateral tibia (right > left, shown by thin red arrow), and lower end of left tibia (green arrow) at growth plate regions. Corresponding computed tomography images revealed subtle intramedullary sclerosis at the lower end of the left femur and lower end of the left tibia involving growth plates. No metaiodobenzylguanidine avid metastatic sites were noted elsewhere in the body

### Conflicts of interest

There are no conflicts of interest.

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