

# Early investigation by fluor-18-fluorodeoxyglucose positron emission tomography of a metastatic basal cell carcinoma presenting with spinal cord compression: A case report

Frédéric Arsenault, MD,<sup>a</sup> Jean-Pierre Ayoub, MD,<sup>b</sup> Anna Danilenko, MD,<sup>c</sup> and Luc Boucher, MD<sup>a</sup>  
 Montreal and Québec City, Québec, Canada

**Key words:** basal cell carcinoma; imaging; nonmelanoma skin cancer.

## INTRODUCTION

The incidence rate of nonmelanoma skin cancer in the United States is estimated at 2.8 million new cases each year, of which, 80% are of basal cell carcinoma (BCC) type. The real incidence of BCC is difficult to determine with precision, as they are usually excluded from most cancer registries.<sup>1</sup> The cumulative lifetime risk of skin cancer is about 20% in the United States<sup>2</sup> and even higher in countries with a greater proportion of fair-skinned individuals<sup>3</sup> where the lifetime risk reaches up to 30% of the population. For both melanomas and BCC, the major etiologic factors include natural and artificial exposure to ultraviolet radiation.<sup>4,5</sup>

BCC is usually treated by excision, with histologic margin control. Although this type of skin cancer has a high incidence, few will eventually show progression or recurrence. BCC shows a very low mortality rate.<sup>6</sup> Metastases are infrequent, and BCC progression is usually characterized by a locoregional spread. However, recurring BCC is more difficult to treat<sup>7</sup> and, if left untreated, can lead to deformities and debilitating effects,<sup>8</sup> ultimately causing death.

## CASE REPORT

A 33-year-old woman came to the emergency room with an acute and rapidly progressive onset of lower limb paresthesias and paraparesis. She reported insidious upper and middle back pain that had started a month prior. Her relevant medical

### Abbreviations used:

<sup>18</sup> F-FDG:	fluor-18-fluorodeoxyglucose
BCC:	basal cell carcinoma
CK:	cytokeratin
CT:	computed tomography
MRI:	magnetic resonance imaging
PET/CT:	positron emission tomography and computed tomography



**Fig 1.** Sagittal view of the initial thoracic spine MRI. T2-weighted, turbo spin echo MRI sequence shows a pathological fracture of the vertebral body at the level of T3 (*white arrow*), with a lesion extending into the spinal canal, causing significant spinal cord compression.

From the Departments of Nuclear Medicine<sup>a</sup> and Medicine,<sup>b</sup> Centre Hospitalier Universitaire de Montréal and the Department of Nuclear Medicine,<sup>c</sup> Centre Hospitalier Universitaire de Québec, Québec City.

Funding sources: None.

Conflicts of interest: None declared.

Correspondence to: Frédéric Arsenault, MD, Department of Nuclear Medicine, Centre Hospitalier Universitaire de Montréal (CHUM), Hôpital Hôtel-Dieu de Montréal, 3840 Rue

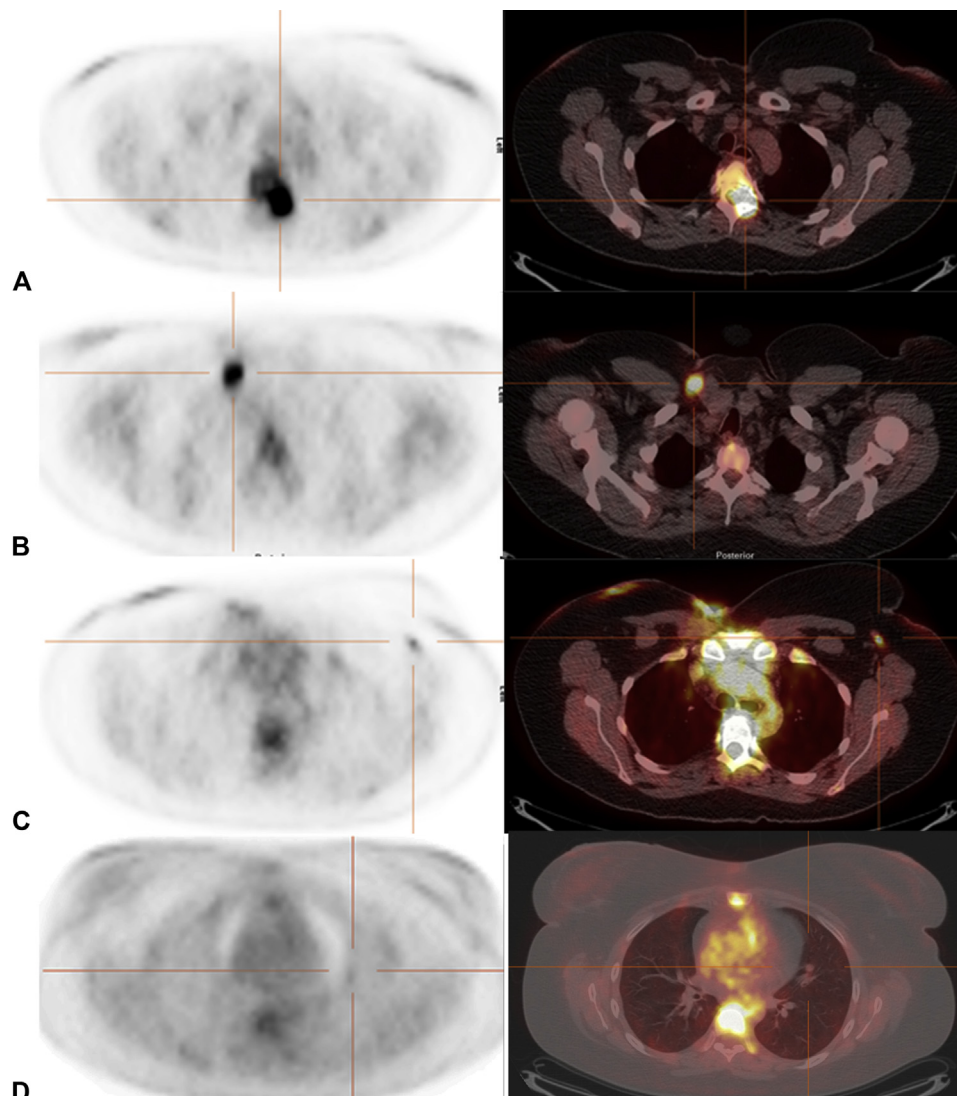
Saint-Urbain, Montréal (Québec) H2W 1T8, Canada. E-mail: [frederic.arsenault@umontreal.ca](mailto:frederic.arsenault@umontreal.ca).

JAAD Case Reports 2015;1:144-6.

2352-5126

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<http://dx.doi.org/10.1016/j.jidcr.2015.03.003>



**Fig 2.** Axial screen capture of  $^{18}\text{F}$ -FDG PET/CT metabolic images and fusion images at the level of the T3 vertebrae metastasis (**A**), the right supraclavicular lymph node metastasis (**B**), the left axillary lymph node metastasis (note the visible right breast focus of uptake) (**C**), and the left lung metastasis (**D**).

history included a recently removed large right breast skin lesion at another hospital. The skin lesion was irregular and ulcerated. Histology of this lesion was unknown at the time of consultation at our center. There was a positive family cancer history (second-degree relatives with breast [40 years of age] and lung cancer [53 years of age]).

With these rapidly evolving symptoms, cervical, thoracic, and lumbar spine magnetic resonance imaging (MRI) was conducted within a few hours. The initial evaluation was completed with a thoracic computed tomography (CT) scan. A pathological fracture of the third thoracic vertebrae with soft tissue extension into the spinal canal causing medullary compression was diagnosed. Fig 1 shows the patient's thoracic spine in sagittal view on the

initial MRI, revealing a T3 pathological fracture and spinal cord compression, explaining the patient's lower limbs symptoms.

In addition to the initial assessment, a positron emission tomography/CT scan (PET/CT) was performed 3 days after patient admission (Fig 2). The known T3 metastasis lesion was highly hypermetabolic (standardized uptake value max: 13.4). A cutaneous focus of fluor-18-fluorodeoxyglucose ( $^{18}\text{F}$ -FDG) uptake on her right breast was seen, but considering a recent surgery, the differential diagnosis included a residual lesion, a metastatic lesion, or an inflammatory process secondary to the surgery. The PET/CT showed an 18- × 13-mm lymph node with intense  $^{18}\text{F}$ -FDG uptake (standardized uptake value max: 5.6) in close relationship with the

right sternocleidomastoid muscle. A second and adjacent hypermetabolic lymph node located slightly posteriorly and a contralateral axillary lymph node were noted, which were both highly suspicious for cancer involvement and were both unsuspected on other imaging modalities. A left 8-mm pulmonary nodule showing high  $^{18}\text{F}$ -FDG uptake was also considered metastatic until proven otherwise. Mammogram did not show any suspicious lesion.

A decompression surgery was performed 5 days after admission. The final histopathologic results confirmed a basal cell carcinoma metastasis with the following immunohistochemical profile: Cytokeratin (CK) AE1/AE3 positive, CK 5/6 positive, CK 20 negative, ER negative, and GCDFP-15 (BRST2) negative. This profile was not in favor of a metastatic neuroendocrine carcinoma such as a Merkel cell tumor or any other skin lesion. Both the vertebral lesion and initial skin lesion specimens were re-examined at another medical center by a neuropathologist and a dermatopathologist, who both confirmed a tumor of basal cell origin with identical histopathologic features. The initial tumor measured 12.6 × 9.4 cm, with perineural and lymphovascular invasion.

## DISCUSSION

Skin cancers are subdivided, in decreasing order of frequency, among basal cell carcinoma, squamous cell carcinoma, malignant melanoma, Merkel cell carcinoma, and other much less common histologic types. The most common subtypes are often the least aggressive ones and they are usually characterized by a very limited locoregional spread. Metastases occur much more often with Merkel cell carcinoma and malignant melanoma.

A literature review on both Embase and Medline databases using the medical subject headings “basal cell carcinoma” and “spinal cord compression” yielded only 3 case reports. One of these described a spinal cord compression secondary to the direct extension of a local aggressive recurrence of a large BCC.<sup>9-11</sup> Few articles address the value of PET/CT in the staging of BCC upon literature review with the medical subject headings “basal cell carcinoma” and “positron emission tomography.”

Most frequently, the primary lesion of a metastatic BCC measures more than 4 cm in diameter, but primary BCCs as small as 1 to 2 cm have been reported to metastasize.<sup>12,13</sup> Lymph nodes, lungs, bones, and skin are the most frequent sites of secondary lesions. Perineural and lymphovascular invasion are associated with a higher risk to metastasize.<sup>14</sup>

This article is a case report of a patient with metastatic basal cell carcinoma presenting with spinal cord compression symptoms, in which PET/CT was used on the early initial workup. A large initial tumor-size BCC that was irregular and ulcerated was initially reported in our patient. In this specific case, the thoracic vertebra metastasis would have been identified before the pathological fracture if a PET/CT had been done at the time of the skin lesion removal surgery because of the high relative uptake value of the metastasis.

Although metastatic BCC is a rare entity, it is nonetheless a tragic outcome for these patients. Clinical and histopathologic features of perineural and lymphovascular invasion are tumor features in patients who might benefit from an initial PET/CT investigation.

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