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Case Report

Nodular fasciitis mimicking recurrent lymphoma on positron emission tomography–computed tomography

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ABSTRACT

20 year old female with no prior medical history presents with diffuse cervical lymphadenopathy. CT and subsequent positron emission tomography–computed tomography (PET/CT) demonstrated diffuse lymphomatous involvement of multiple lymph nodes in the neck, mediastinum, and retroperitoneum. The patient underwent ABVD therapy which resulted in the lymphoma being in remission for 2 years. The patient had a repeat PET/CT done after 2 years due to complaints of recurrent lymphadenopathy. The PET/CT revealed a new hypermetabolic focus by the right femur. MRI demonstrated an enhancing nodule in that region which raised suspicion for possible site of lymphoma recurrence. Percutaneous biopsy showed nodular fasciitis.

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Introduction

Nodular fasciitis is a rare, benign entity often incidentally diagnosed on imaging and subsequent biopsy. In the setting of a primary malignancy, nodular fasciitis can pose as a confounding lesion as it can also demonstrate high fluorodeoxyglucose (FDG) avidity and be interpreted as a false positive on positron emission tomography–computed tomography (PET/CT). The underlying cause of nodular fasciitis is still unclear and can be an alarming finding in the background of a treated primary malignancy.

Case report

A 20-year-old female with no medical history presents with persistent right-sided neck swelling for 3 months. Subsequent

CT of the neck revealed pronounced cervical adenopathy (Figs. 1 and 2). Biopsy was performed on a deep subplatysmal lymph node. Pathology later came back as nodular sclerosing subtype of Hodgkin's lymphoma. PET of the entire body delineated avid FDG uptake in multiple lymph nodes throughout multiple cervical lymph nodes (maximum standardized uptake value [SUV max] 6.1), right parotid gland (SUV max 10.6), mediastinal nodes (SUV max 9.1), pulmonary hila (SUV max 7.9), bilateral axillary nodes (SUV max 3.6), and retroperitoneal nodes (SUV max 6.4). The patient was placed on chemotherapy (doxorubicin, bleomycin, vinblastine, and dacarbazine) with profoundly favorable response indicated by lowered-FDG uptake and resolution of lymphadenopathy. Notably, the mediastinal nodes demonstrated an SUV max of 2.1 with additional eradication of malignant glucose uptake in the neck and the retroperitoneum. Remission was achieved

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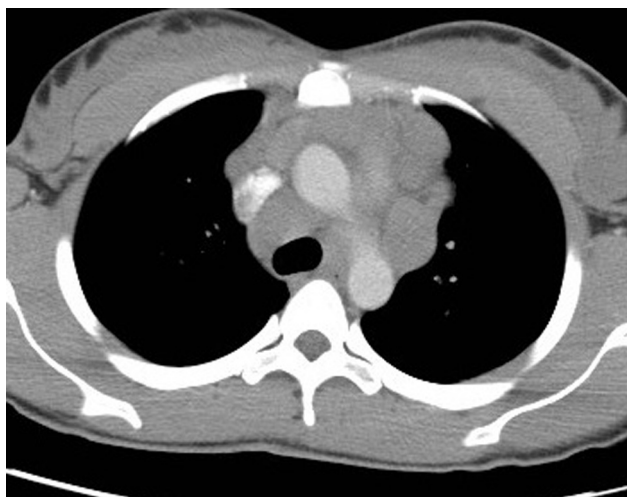


Fig. 1 – Axial chest CT reveals diffuse mediastinal lymphadenopathy.

until 2 years later when the patient again developed worrisome symptoms of lymphadenopathy. PET imaging was subsequently performed to evaluate for recurrent lymphoma. Although the results were negative for lymphoma in the chest and the abdomen, the PET scan did reveal a new hypermetabolic mass lesion adjacent to the right femur SUV max 3.0 (Figs. 3 and 4). This lesion appeared highly suspicious for recurrent lymphoma and was subsequently biopsied by interventional radiology with final pathology results indicating nodular fasciitis (Fig. 5).



Fig. 2 – Coronal-CT reformat demonstrates widespread right greater than left cervical lymphadenopathy and parotid enlargement.

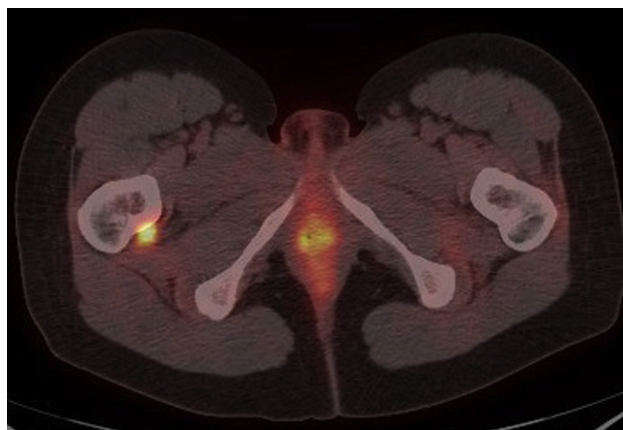


Fig. 3 – PET/CT with 12.0 mCi 18F-FDG demonstrates a focal area of uptake by the right femur with an SUV max of 3.0.

Discussion

Nodular fasciitis can be a fascially based, intramuscular, or subcutaneous lesion that exhibits accelerated growth and harbors non-neoplastic cells [1]. There is also documentation of extremely rare intraneural occurrence of nodular fasciitis [2]. Nodular fasciitis most frequently occurs in the forearm and throughout other regions of the upper extremity. This disease phenomenon can also show a predilection for the trunk, head, and neck, and as in the case report, the lower extremities. Composed of fibroblasts and myofibroblasts, nodular fasciitis has been speculatively attributed to past

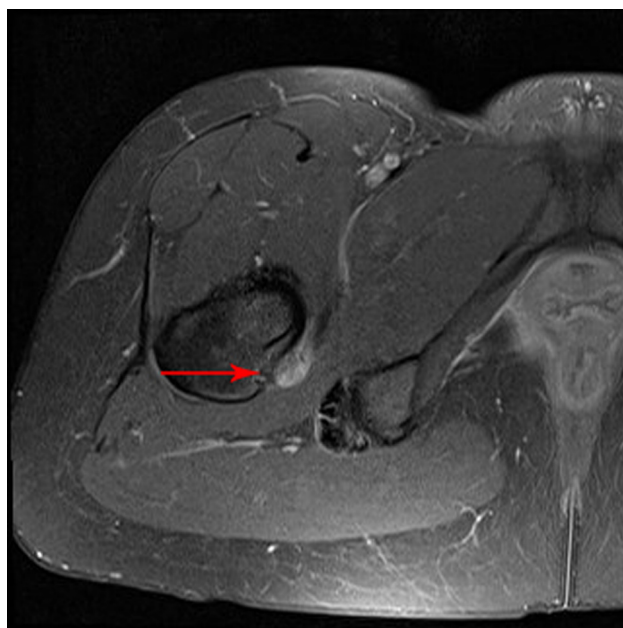


Fig. 4 – Magnetic resonance imaging axial T1-fat saturated after contrast shows an enhancing lesion correlating with the area of increased FDG uptake by the right femur.

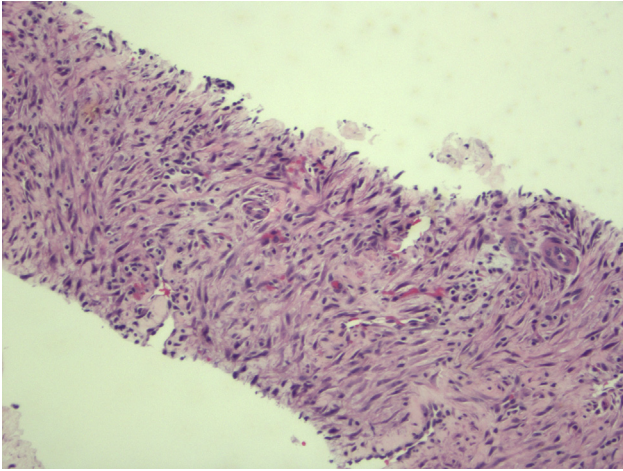


Fig. 5 – Cores in formalin at 10X reveals myofibroblasts, myxoid matrix, and loosely organized myofibroblasts. The spindle cells are positive for the smooth muscle actin and negative for cytokeratin, S100, Desmin, epithelial membrane antigen.

trauma and possibly underlying chromosomal abnormalities which would explain the lesion's high-mitotic index and resultant avid FDG uptake, bearing close resemblance to malignancy [3,4].

There have not been many cases of documented PET/CT findings of biopsied-confirmed nodular fasciitis especially in the setting of treated lymphoma. In the case report, the patient initially presented with non-Hodgkin's lymphoma that had a resoundingly positive response to interval chemotherapy who then later developed this hypermetabolic lesion in the right thigh on surveillance PET/CT. Although this was compellingly suspicious for lymphomatous recurrence, biopsy was done which later was revealed to be nodular fasciitis. Kim et al documented a hypermetabolic focus on PET/CT in the gluteal region in a patient who had adjuvant chemotherapy and resection for a sarcoma 8 years prior. In addition, Kim et al also noted an FDG-avid lesion in the upper extremity of a patient who had radiation therapy and lymph node dissection for melanoma 9 years ago. The aforementioned lesions presented by Kim et al [5] later were multiple instances of biopsy proven nodular fasciitis. In a patient with known nodular fasciitis in the groin, subsequent PET/CT primarily indicated for pulmonary nodules later revealed an increased size of the groin lesion also demonstrating exuberant FDG. This actually was a histopathologically proven myofibroblastic sarcoma [6].

In terms of management, nodular fasciitis has been shown to spontaneously and definitively regress as early as 4 weeks

into the initial diagnosis [7]. En bloc excision is not necessarily warranted as partial excision is sufficient to result in spontaneous regression of the lesion [8]. In the event of recurrence, the diagnosis of nodular fasciitis should be reevaluated. Clear diagnostic distinction between nodular fasciitis and sarcoma is vital to management since nodular fasciitis does not require wide margin, radical dissection as would be necessary in sarcoma resection [9]. Although there is no role for systemic steroids in treatment for nodular fasciitis, there has been documentation of lesion regression being targeted with direct steroid injection [10].

In conclusion, a solitary area of focal uptake in the soft tissues on PET/CT in the setting of treated malignancy or incidental finding, nodular fasciitis should be kept in the differential diagnosis. Fludeoxyglucose is widely known for its nonspecific areas of uptake on PET scan which always warrants consideration of entities that can yield false positive results.

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