Rare Presentations of Muscular Infiltrations in Classical Hodgkin's lymphoma-A Case Series

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ABSTRACT

Hodgkin's lymphoma (HL) is a malignant condition of the lymphoid system that involves supradiaphragmatic recesses, and typically presents with lymphadenopathy and spreads from one nodal group to the other. Skeletal muscle infiltration in HL is uncommon. Two cases of classical HL evaluated by an ^{18}F-FDG PET-CT scan detecting multiple extranodal metastases along with skeletal muscle involvement are reported here, and their outcomes are discussed along with the importance of the PET-CT scan as a good imaging modality.

Keywords: ^{18}F-FDG, Positron emission tomography, Hodgkin's lymphoma, Muscular involvement in HL.

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INTRODUCTION

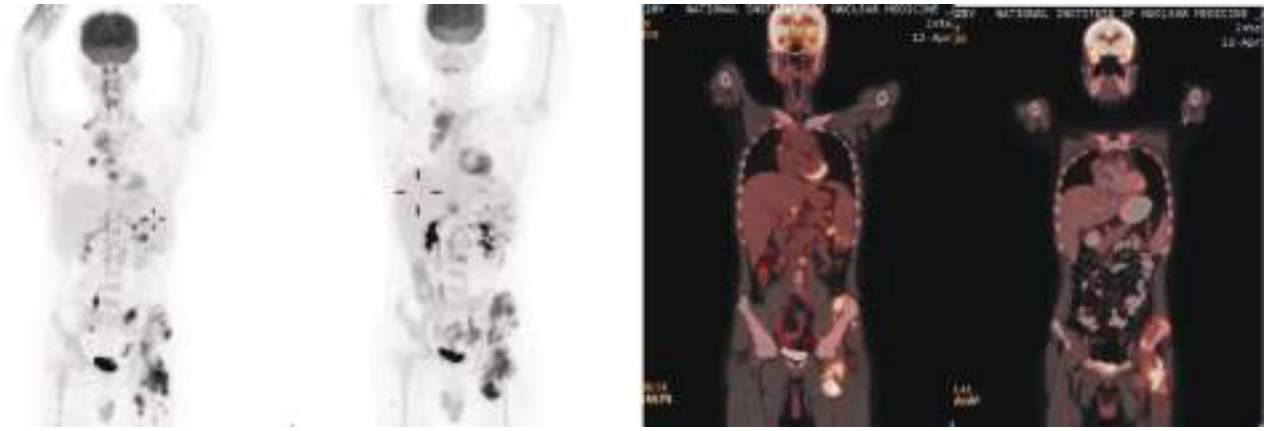
Hodgkin disease is almost always limited to the lymph nodes. Extranodal involvement in Hodgkin disease is much less common than in non-Hodgkin lymphoma. Lymphoid tissue is not present in healthy skeletal muscle therefore, lymphatic infiltration of skeletal muscle by Hodgkin's lymphoma is extremely uncommon. Extranodal involvement in early staging is critical for treatment planning. Two cases of Hodgkin's lymphoma involving skeletal muscles at various sites are reported here, along with post-treatment outcomes.

CASE REPORT

Both the patients initially presented to clinician with cervical lymphadenopathy and the first case was associated with mediastinal mass. FNAC from the cervical lymph node revealed mixed cellularity type classical HL. Immunohistochemistry showed CD30, CD15, PAX5 positive but CD20 negative suggesting Hodgkin's lymphoma.

CASE 1

A 20-year-old man, diagnosed with classical HL and treated with six cycles of chemotherapy was referred to the PET-CT division of National Institute of Nuclear Medicine & Allied Sciences (NINMAS) for a whole body ^{18}F-FDG PET-CT after 15 months of initial diagnosis. Patient had no pre-treatment baseline PET study done before starting chemotharapy. ^{18}F-FDG PET-CT scan images showed multiple hypermetabolic lymph nodes above and below the diaphragm with splenic and skeletal involvement. Multiple hypermetabolic muscular lesions involving the iliacus, rectus femoris, and gluteus medius on the left side with an associated increased bulk of muscles suggested muscular infiltrations. Overall, the disease appeared to be in stage IV, with a Deauville score of 5. The muscular lesions were confirmed as HL by histopathology. After receiving another 6 cycles of chemotherapy, a second PET-CT scan was done for evaluation of therapy responses. This time, the PET-CT images showed complete metabolic and morphologic regression of FDG-avid splenic lesions, insignificant interval changes of hypermetabolic lymph nodes and bony lesions, and persistent hypermetabolic muscular lesions. Overall, the disease was classified as Stage IV, with a Deauville score of 5.



a b c d

Figure 1: a, b ^{18}F-FDG PET MIP images & c, d whole body coronal PET-CT fusion images before and after chemotherapy showing persistent hypermetabolic muscular lesions and lymph nodes.

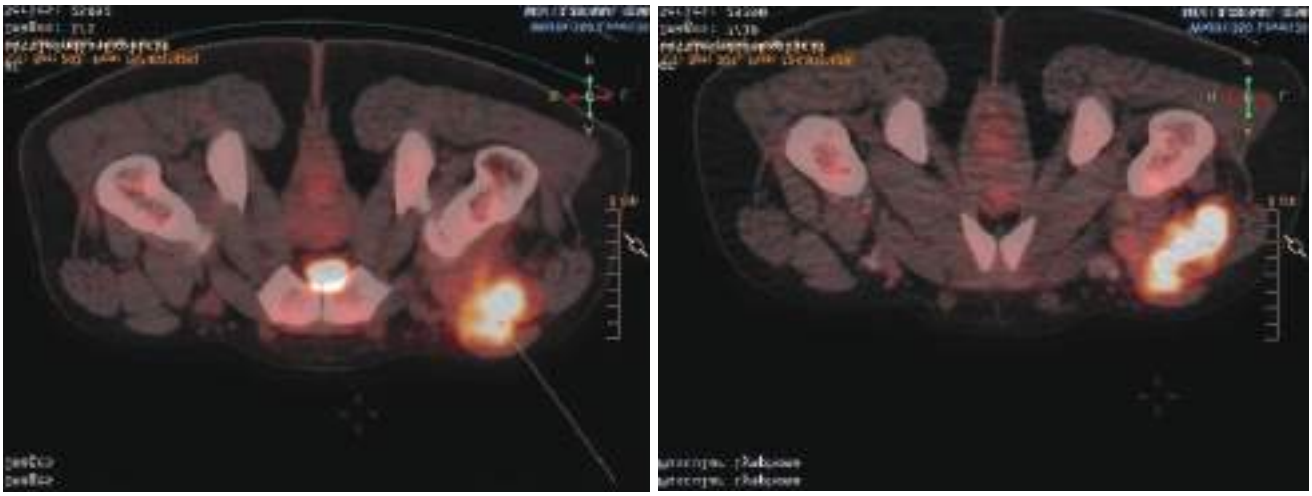


Figure 2: Transaxial fusion PET-CT images show persistent hypermetabolic muscular lesions

CASE 2

A 39-year-old woman was diagnosed with classical Hodgkin's lymphoma and had a baseline PET-CT scan done elsewhere. Her PET-CT images revealed multiple hypermetabolic supra and infra diaphragmatic lymph nodes, as well as pulmonary, splenic, and extensive bony involvement, as well as a focal area of FDG uptake in the gluteus medius muscle. She was treated with 3 cycles of chemotherapy and came to our department for a PET-CT scan to see the therapy's response. PET-CT scan showed partial metabolic and morphologic regression of supradiaphragmatic lymph nodes and pulmonary, splenic, and skeletal lesions but metabolic progression of infradiaphragmatic lymph nodes. Metabolic progression is also noted in a muscular lesion in the gluteus medius, with a newly developed hypermetabolic lesion in the right psoas major muscle. A biopsy was taken from the muscular lesion and confirmed lymphoma involvement. The patient was then treated with second-line chemotherapy, and another PET-CT scan was done in our institute to see the therapy response. This follow-up PET-CT scan showed almost complete regression of previously reported hypermetabolic lymph nodes, pulmonary, splenic, and skeletal lesions. There was complete metabolic and morphologic regression of a previously reported hypermetabolic muscular lesion in the right psoas muscle, whereas an FDG-avid lesion in the left gluteus medius muscle shows metabolic and morphologic regression. With a Deauville score of 4, the overall impression was of significant disease regression and partial therapy response.

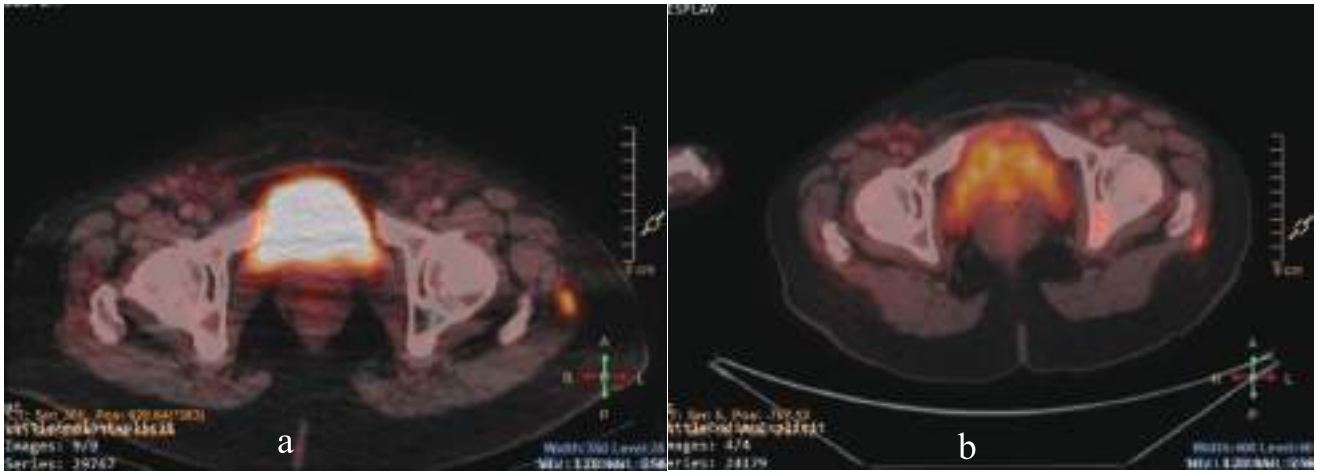


Figure 3: Transaxial fusion F-18 FDG PET-CT images showing hypermetabolic lesion in gluteus muscle (a) which regressed metabolically and morphologically in follow up scan (b).

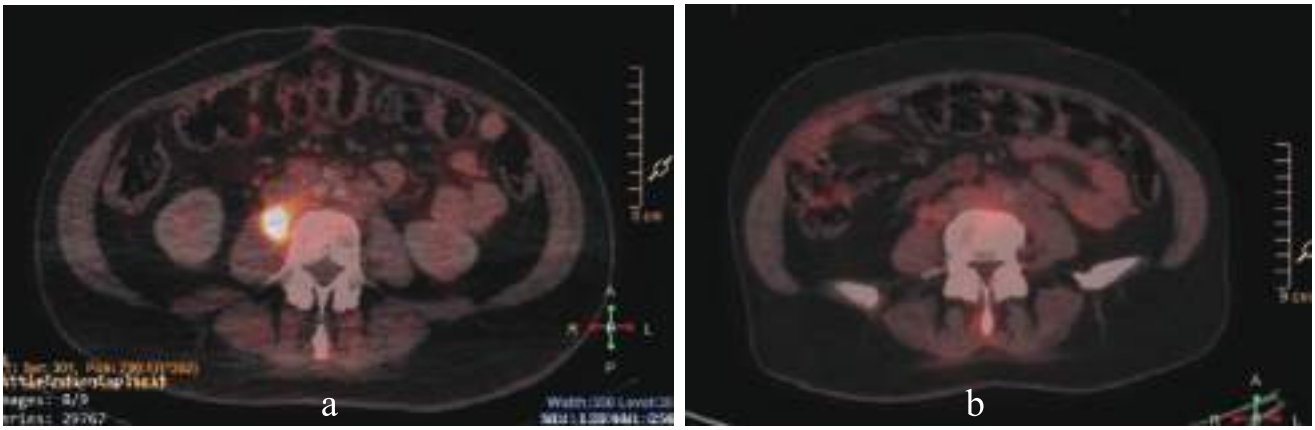


Figure 4: Transaxial fusion F-18 FDG PET-CT images showing complete regression of hypermetabolic lesion in right psoas major muscle (b) which was present in previous scan (a).

DISCUSSION

The common manifestation of Hodgkin's lymphoma (HL) is supradiaphragmatic recesses. Usually, it spreads from one group of lymph nodes to another nodal group that is contiguous. Healthy skeletal muscle is devoid of lymphoid tissue. As a result, muscle involvement in lymphoma is uncommon. In cases of HL, skeletal muscle lymphoma is extremely uncommon; rather, it is more common in non-Hodgkin's disease (0.3% with HL and 1.5% with NHL). The thighs, chest, and arms are the most frequent areas (1). There are three modes of lymphoma involvement in skeletal muscle reported, such as direct invasion from a nearby affected lymph node or bone, metastatic spread, and least frequently, primary muscular lymphoma (2). The majority of cases of metastatic muscle involvement are secondary (1).

The role of ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography–computed tomography (PET-CT) for accurately determining disease extent in HL has been established for the last ten years (3). Multifocal lesions of ^{18}F-FDG in muscles or asymmetric uptake of FDG can point to lymphoma involvement in the musculoskeletal system (4, 5). Though the imaging modality differs, muscle involvement can be identified by PET-CT scan due to its excellent sensitivity. In addition ^{18}F-FDG PET-CT is used increasingly for staging and as a follow up imaging modality (3). Hueltenschmidt et al. evaluated the clinical utility of FDG PET in comparison to traditional imaging modalities for therapy monitoring and assessment in 81 patients with HL, with an accuracy of 91% compared with 62% for other imaging methods (5).

As skeletal muscle involvement in HL is a rare condition, it indicates extensive disease spread and a poor outcome. PET-CT scan evaluation is important to guide patient management. In our first case, a PET-CT scan identified

the multiple areas of extranodal involvement of HL, including multiple skeletal muscles as well as the supra- and infra-diaphragmatic hypermetabolic lymph nodes. The biopsy from the muscular lesion confirmed lymphoma involvement, and the patient was treated further with another six cycles of chemotherapy. Though there was regression of other extranodal infiltrations, insignificant changes were noted in hypermetabolic muscular lesions and also in the FDG-positive lymph nodes, indicating the aggressive nature of the disease. Unfortunately, this young man expired within two and a half years of his initial diagnosis, which is indicative of a poor outcome. Baqari S.A.S. et al. described a case of an 11-year-old child with HL and muscular involvement who had resistant disease but achieved remission after 3rd-line chemotherapy (6). Interestingly, our second case showed significant metabolic and morphologic regression of muscular lesions in a follow-up PET-CT scan after a second line of chemotherapy.

First case reported here did not have the baseline PET-CT scan, rather the identifying PET-CT scan was done 15 months after the first line chemotherapy. The aggressive nature of the disease and also the delayed detection caused the poor prognosis. On the other hand, the early detection of muscular infiltration of HL helped in management with good outcome in second reported case. F-18 FDG PET-CT scan played a pivotal role in treatment planning here. Close regular follow up and evaluation is required as this is a high risk disease.

CONCLUSION

F-18 FDG PET-CT scan has potential role in delineating the extent of disease in HL and also involvement of unusual sites like skeletal muscles. Because of its aggressive nature, early detection of muscular infiltration by F-18 FDG PET-CT scan can be helpful for better treatment planning.

REFERENCES

1. Parra C, Tomich G, Quaranta A, Staffieri R, Villavicencio R. PET/CT of extranodal involvement in lymphoma. Imagenes. 2012;1:39.
2. Binici DN, Karaman A, Timur O, Tosun Tasar P, San AV. Primary skeletal muscle lymphoma: a case report. Molecular and Clinical Oncology. 2018 Jan 1;8(1):80-2.
3. Burton C, Ell P, Linch D. The role of PET imaging in lymphoma. British journal of haematology. 2004 Sep;126(6):772-84.
4. Paes FM, Kalkanis DG, Sideras PA, Serafini AN. FDG PET/CT of extranodal involvement in non-Hodgkin lymphoma and Hodgkin disease. Radiographics. 2010 Jan;30(1):269-91.
5. Hueltenschmidt B, Sautter-Bihl ML, Lang O, Maul FD, Fischer J, Mergenthaler HG, Bihl H. Whole body positron emission tomography in the treatment of Hodgkin disease. Cancer. 2001 Jan 15;91(2):302-10.
6. Baqari SA, Razi M, Hayat J, Wali RM. Classical Hodgkin's Lymphoma with Skeletal Muscle Involvement: A Testing Case. Journal of the College of Physicians and Surgeons Pakistan. 2019 Jan 1;29(1):81-3.