The Value of FDG PET/CT Imaging in Dermatomyositis As A Paraneoplastic Syndrome in Malignancy Suspicion

T Ones, M Aras, F Novruzov, F Dede, S Inan?r, T Erd?l, H Turoglu

Citation

Abstract
Dermatomyositis (DRM) is a polymyositis accompanied by skin inflammation. It may be seen in various types of cancers as a paraneoplastic syndrome. A 45-year-old male presented with DRM which F-18 fluorodeoxyglucose PET/CT (FDG PET/CT) revealed intense hypermetabolic nodule in the right lung and multiple mediastinal LAPs which were previously underestimated in diagnostic CT. The nodule was later biopsied and reported as lung cancer. After chemotherapy treatment the typical skin findings for DRM (Paraneoplastic Syndrome) was disappeared. FDG PET/CT seems to be a useful method for cancer screening in DRM patients.

INTRODUCTION
Dermatomyositis (DRM) is a clinical syndrome of unknown cause involving the skeletal and myocardial muscles. Five basic diagnostic criteria of DRM are; symmetrical proximal muscle weakness, abnormal muscle biopsy, increased skeletal muscle enzymes, abnormal electromyography and typical skin findings with or without dysphagia and shortness of breath (1). A recent population-based study from Mayo Clinic found the incidence of dermatomyositis to be 13.98 per million in women and 4.68 per million in men (2). DRM may be seen with primary rheumatologic syndromes and in various types of cancers as paraneoplastic syndrome. First, in 1916 Stertz showed the relationship between gastric cancer and DRM (3). It is thought that in patients with malignancy, DRM develops due to a reaction against cancer cells, but the pathophysiology of DRM could not be fully explained yet.

18-F fluorodeoxyglucose PET/CT (FDG PET/CT) has been extensively used in tumor imaging recently. Although the role of FDG PET/CT in cancer screening is not well known, there are papers that recommended it as alternative to conventional methods. In this case report with a brief review of literature, we aimed to underline the importance of FDG PET/CT in cancer screening in DRM patients.

CASE REPORT
A 45-year-old male patient with ANA seropositivity and symptoms of DRM as a paraneoplastic syndrome was admitted to the dermatology service. His diagnostic thoracic CT revealed nodular lesion located in the superior-posterior segment of the lower lobe of the right lung without any other pathology. Whole body FDG PET/CT imaging was planned for the metabolic characterization of this nodule. FDG PET/CT demonstrated intense FDG uptake, not only in the suspected pulmonary nodular lesion (Fig.A, arrows), but also in multiple enlarged mediastinal lymph nodes (Fig.B, arrows).
Additionally symmetric hypermetabolism in the proximal muscles of the upper and the lower extremities was seen in Maximum Intensity Projection (MIP) images (Fig. C, arrows) due to DRM which was later confirmed by muscular biopsy.

Non-small cell lung cancer (NSCLC) was verified by CT guided biopsy. The patient is still alive and after chemotherapy treatment the typical skin findings for DRM (Paraneoplastic Syndrome) was disappeared.

**DISCUSSION**

Dermatomyositis is a type of connective-tissue disease (CTD) characterized by muscle and skin inflammation. Cancer risk is greater than normal population in DRM patients and the risk is highest in the first year following the diagnosis (3-5). The most commonly reported tumors are ovarian cancer, breast cancer, melanoma and colon cancer (3). Other comorbid cancers commonly associated with DRM are cancers of the lungs/mediastinum, bone/joints and kidney, as well as lymphoma/leukemia and nasopharyngeal cancer (3, 5).

Limaye et al. searched mortality and its predominant causes in inflammatory myositis patients and they found that malignancies were the third most common cause of death in this group of patients (6). Adzic et al. investigated the clinical features of lung cancer in patients with CTD and
they concluded that the majority of CTD patients who
devoted lung cancer were diagnosed at advanced stage and
had poor survival (7). Fardet et al. studied the factors
associated with underlying malignancy in DRM patients (8).
They found that the independent factors associated with an
underlying malignancy in patients with DRM were; an age at
diagnosis >52 years, a rapid onset of skin and/or muscular
symptoms, the presence of skin necrosis or periungual
erythema and a low baseline level of complement factor C4.
However, low baseline lymphocyte count (<1500/mm3) was
a protective factor of malignancy.

We believe that the evaluation should still begin with a
careful history and physical examination and “standard”
laboratory evaluation. Any abnormalities found should be
thoroughly investigated. The recommended cancer screening
in DRM patients includes CT of the thorax/abdomen in all
patients, US of the pelvic region and mammography in
women, US of testes in men under 50 years and colonoscopy
in men and women over 50 (9). If CT-thorax is negative,
FDG PET/CT is recommended for screening of the patients
with paraneoplastic neurological syndromes (9).

O’Callaghan et al. concluded that the performance of FDG
PET/CT, in a single imaging study, for occult malignant
disease in patients with paraneoplastic myositis was
comparable to that of broad conventional screening, which
includes multiple tests (10).

In our case report, FDG PET/CT demonstrated symmetric
hypermetabolism in the proximal muscles of the upper and
the lower extremities (Fig. 1C, arrows) due to DRM which
was later confirmed by muscular biopsy. Additionally, FDG
PET/CT revealed intense hypermetabolic nodule (NSCLC
was verified by biopsy) in the right lung and multiple
mediastinal LAPs which were previously underestimated in
diagnostic CT.

In conclusion; in patients with DRM, one has to be careful
for the probability of coexistence of cancer and thus further
studies should be performed to detect malignancy. FDG
PET/CT seems to be a useful method for both cancer
screening and revealing active involvement in this group of
patients.

References
1. Bohan A, Peter JB. Polymyositis and dermatomyositis
2. Bendewald MJ, Wetter DA, Li X, Davis MD. Incidence of
dermatomyositis and clinically amyopathic dermatomyositis:
a population-based study in Olmsted County, Minnesota.
3. Zhang W, Jiang SP, Huang L. Dermatomyositis and
malignancy: a retrospective study of 115 cases. Eur Rev
4. Wakata N, Kurihara T, Saito E, Kinoshita M.
Polymyositis and dermatomyositis associated with
2002; 41:729-34.
5. Chen YJ, Wu CY, Shen JL. Predicting factors of
malignancy in dermatomyositis and polymyositis: a case-
6. Limaye V, Hakendorf P, Woodman RJ, Blumbergs P,
Roberts-Thomson P. Mortality and its predominant causes in
a large cohort of patients with biopsy-determined
inflammatory myositis. Intern Med J. 2010 Dec 1.doi:
10.1111/j.1445-5994.2010.02406.x. [Epub ahead of print]
7. Adžić TN, Pesut DP, Nagorni-Obraudović LM, Stojšić JM,
Vasiljević MD, Bouros D. Clinical features of lung cancer in
patients with connective tissue diseases: a 10-year hospital
8. Fardet L, Dupuy A, Gain M, Kettaneh A, Chérin P,
Bachelez H, Dubertret L, Lebbe C, Morel P, Rybojad M.
Factors associated with underlying malignancy in a
retrospective cohort of 121 patients with dermatomyositis.
B, Graus F, Grisold W, Honnorat J, Sillevis Smitt PAE,
Tanasescu R, Vedeler CA, Voltz R, Verschuuren JGJM.
Screening for tumors in paraneoplastic syndromes: report of
10. Selva-O’Callaghan A, Grau JM, Gámez-Cenzano C,
Vidaller-Palacin A, Martinez-Gómez X, Trallero-Aragués E,
Andía-Navarro E, Vilardeil-Tarrés M. Conventional cancer
screening versus PET/CT in dermatomyositis/polymyositis.
The Value of FDG PET/CT Imaging in Dermatomyositis As A Paraneoplastic Syndrome in Malignancy Suspicion

Author Information

Tunc Ones, M.D
Department of Nuclear Medicine, Marmara University School of Medicine

Mustafa Aras, M.D
Department of Nuclear Medicine, Marmara University School of Medicine

Fuad Novruzov, M.D
Department of Nuclear Medicine, Marmara University School of Medicine

Fuat Dede, M.D., Assoc. Prof
Department of Nuclear Medicine, Marmara University School of Medicine

Sabahat Inanır, M.D., Prof
Department of Nuclear Medicine, Marmara University School of Medicine

T. Yusuf Erdolu, M.D., Prof
Department of Nuclear Medicine, Marmara University School of Medicine

H. Turgut Turoglu, M.D., M. Sc., Prof
Department of Nuclear Medicine, Marmara University School of Medicine