

# Unusual Intense Fluorodeoxyglucose Uptake in the Intercostal Muscles Due to Severe Shortness of Breath in a Patient with Heart Failure

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## Abstract

We present a case of unusually intense Fluorodeoxyglucose uptake in the intercostal muscles during a Fluorodeoxyglucose positron emission tomography (FDG-PET). We hypothesized that severe left ventricular failure causing the patient to be short of breath during the study in association with insulin injection as part of study protocol led to the intense uptake of FDG in the respiratory muscles causing such an unusual appearance.

**Keywords:** Positron emission tomography, skeletal muscle, viability study

## Introduction

Skeletal muscle uptake has been previously described on fluorodeoxyglucose positron emission tomography (FDG-PET).<sup>[1]</sup> It has also been documented that patients with shortness of breath and labored breathing can have increased uptake in the respiratory muscles.<sup>[2]</sup> Benign skeletal muscle uptake usually has a symmetric pattern and follows the anatomy of the muscular group and no corresponding lesion can be seen on the integrated computed tomography (CT) study.<sup>[1]</sup>

## Case Report

A 65-year-old female with left ventricular failure (ejection fraction of 20-29% on echocardiography) was referred

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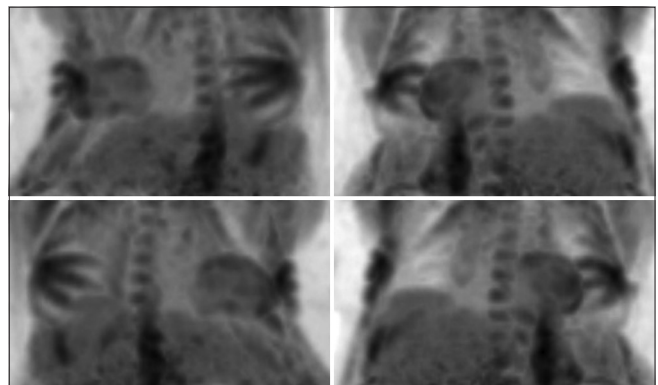
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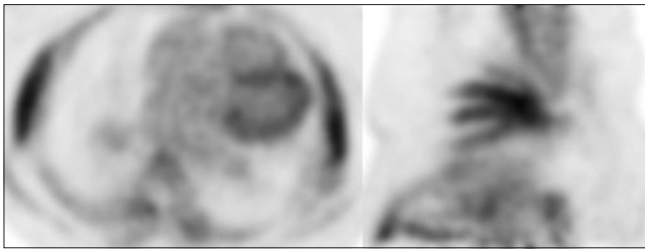
for FDG-PET study to assess myocardial viability. The viability study protocol included fasting for 8 h followed by 25-50 g of oral glucose and 1-2 units of intravenous insulin injection prior to the study. The oral glucose dose was determined by the fasting blood sugar level and the insulin dose was determined by blood sugar level taken 1 h after the oral glucose was given. The patient was reported to be extremely short of breath during the study. Study was performed using a single 10 min static acquisition on a PET/CT scanner (Siemens Biograph mCT, Siemens Healthcare, Germany). A total



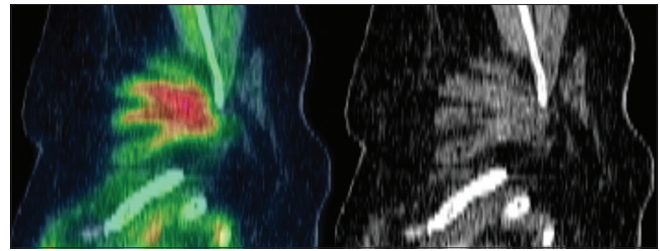
**Figure 1:** Maximum intensity projection views show intense fluorodeoxyglucose uptake in intercostal muscles creating a picture of two demonic hands on either side of the patient's chest

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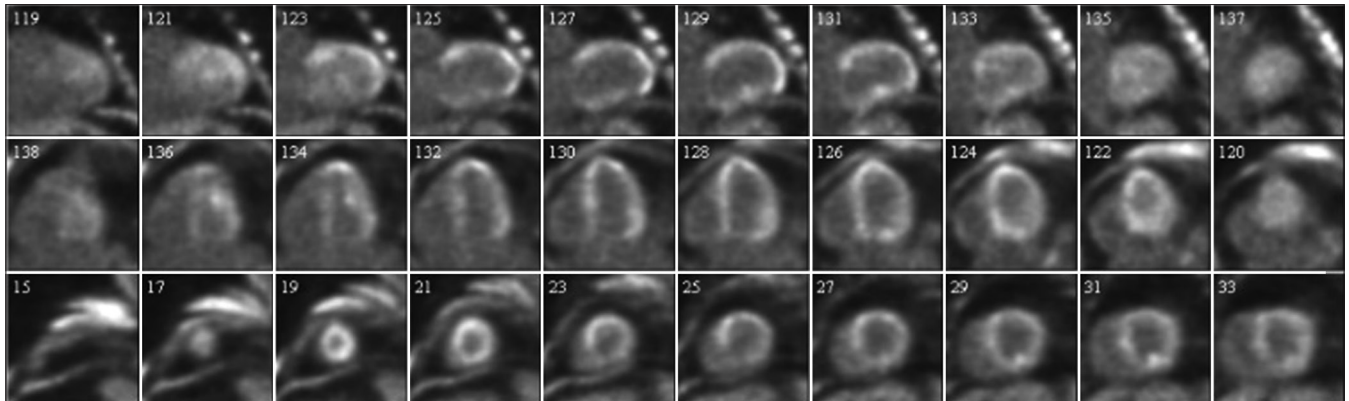
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**Figure 2:** Axial and sagittal images show fluorodeoxyglucose uptake in intercostal muscles



**Figure 3:** Sagittal positron emission tomography computed tomography fusion images



**Figure 4:** Short and long axes reconstruction images show fluorodeoxyglucose uptake in the intercostal muscles

FDG dose of 495.0 MBq was given. The viability study showed viable myocardium in the apex and distal interventricular septum. There was additional finding of unusually intense, bilateral and symmetrical intercostal muscle uptake giving the picture of two demonic hands on either side of the patient's thorax [Figures 1-4 and Video 1].

## Discussion

Focal skeletal muscle uptake although well described may still pose a diagnostic dilemma. Such intense intercostal muscle uptake and the resultant peculiar picture are unusual. We hypothesized that severe left ventricular failure causing the patient to be severely short of breath in association with the study protocol, which

included injection of insulin have both led to the intense uptake of FDG in the respiratory muscles causing such an unusual appearance.

## References

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