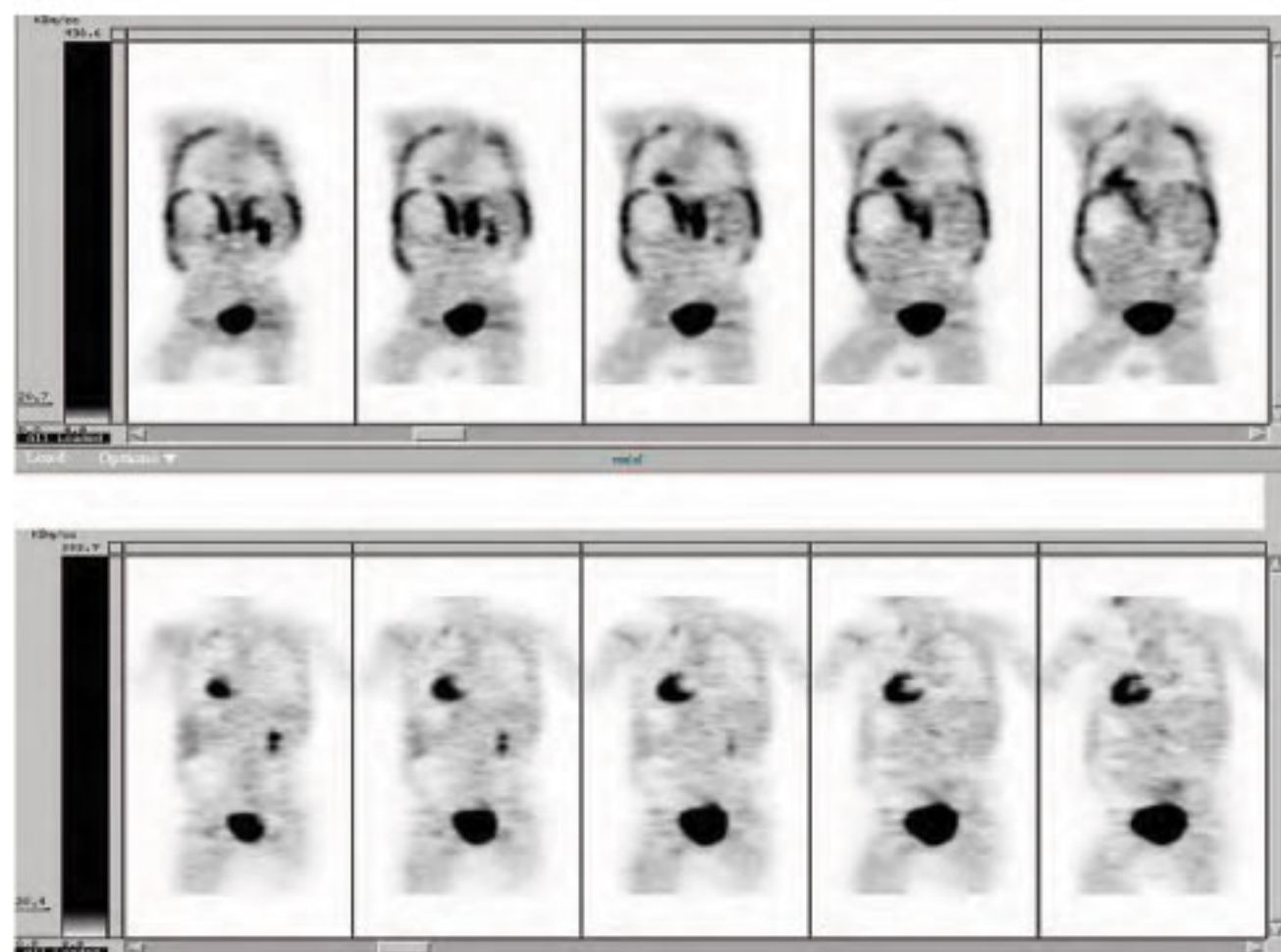


## Increased muscle $^{18}\text{F}$ -FDG uptake in an agitated child

**To the Editor:** With widespread availability and use of fluorine-18-fluorodesoxyglucose-positron emission tomography ( $^{18}\text{F}$ -FDG-PET) in current oncologic practice, there is a growing body of evidence of false positive scans due to several reasons [1-8]. Fluorine-18-FDG hypermetabolism in tensing muscles is often a source of an artifactual "hot" scan and may be misinterpreted as metastatic lesion, if not carefully correlated [1-8]. We present  $^{18}\text{F}$ -FDG-PET scan in an extremely agitated crying child demonstrating intensely avid  $^{18}\text{F}$ -FDG uptake in muscles although out the body, including the diaphragmatic crura and the vocal cords. This case is a useful addition to the current body of literature of false positive  $^{18}\text{F}$ -FDG-PET scans.

A two years old boy presented with swelling over the right ankle of two months duration. After initial investigations, excision biopsy of the swelling showed a high grade round cell tumor. Magnetic resonance imaging (MRI) of the ankle showed an ill defined enhancing soft tissue lesion at the level of tibio-talar joint in the anterior soft tissues and in the subcutaneous fat, which after was re-excised showed no residual tumor. The child was treated with chemotherapy and high dose rate interstitial brachytherapy to a total dose of 3000cGy. Post-treatment MRI demonstrated residual ill-defined soft tissue in the antero-lateral aspect of the right ankle, significantly regressed. The child was referred for an  $^{18}\text{F}$ -FDG-PET study for clarification of the issue i.e. determination of residual viable tumor.



**Figure 1a.** (upper panel) Whole body  $^{18}\text{F}$ -FDG-PET study (coronal slices) on the 1<sup>st</sup> day showing the abnormally increased  $^{18}\text{F}$ -FDG uptake in the diaphragm and inter costal muscles. **1b.** (lower panel) Repeat  $^{18}\text{F}$ -FDG-PET was acquired three days later with the child appropriately sedated. No  $^{18}\text{F}$ -FDG uptake was noted in the whole body survey this time.

Whole body  $^{18}\text{F}$ -FDG-PET study (Fig. 1a) was done 60min after intravenous injection of 185MBq of  $^{18}\text{F}$ -FDG. The child was fasting for 6h prior to the study. The child was irritable on the day of the study and crying vigorously during the injection and the post injection period. Finally the image was acquired in the prone position. The images were reconstructed using standard ordered subset expectation-maximization (OSEM) algorithm and generating transaxial, coronal and sagittal images. A three dimensional maximal intensity picture (MIP) image was

also generated. Normal physiological tracer uptake was seen in the brain, salivary glands, myocardium, liver, spleen, kidneys, urinary bladder and the gut. No area of hypermetabolism was visualized at the site of the lesion in the right ankle (not shown in the Figure). The diaphragm and inter costal muscles showed abnormally increased  $^{18}\text{F}$ -FDG uptake (Fig. 1a). This was attributed to the increased muscular activity and glucose utilization in these respiratory muscles during crying. This had to be differentiated from pathological tracer uptake. Also noted was the movement artifact in the right ankle region. A repeated  $^{18}\text{F}$ -FDG-PET was acquired three days later (Fig. 1b) with the child appropriately sedated. No  $^{18}\text{F}$ -FDG uptake was noted in the whole body survey this time. Increased  $^{18}\text{F}$ -FDG uptake in muscles can occur due to various etiologies [1-3, 7-11], but physiologically contracting muscle is an important cause of image artifact [1, 2]. *In conclusion*, this case of increased  $^{18}\text{F}$ -FDG uptake due to excessive muscle hypermetabolism that resolved after a normal state of the patient may be useful to the interpreting physicians.

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