

# Covid-19 Vaccination May Cause FDG Uptake Beyond Axillary Area

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## Case report

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# Abstract

## Background

The vaccination immune response may induced false-positive  $^{18}\text{F}$ -FDG PET/CT uptake.

## Case presentation

An extended supraclavicular lymph nodal activation after Coronavirus Disease 2019 (Covid-19) vaccination revealed on  $^{18}\text{F}$ -FDG PET/CT mimics a Virchow nodule in a patient with medical history of well-differentiated appendicular adenocarcinoma.

## Conclusion

This case highlights a nodal activation beyond axillary area and the importance of documenting vaccination history at the time of scanning to avoid false-positive results.

## Background

Development of vaccines to prevent Covid-19 is a hope to prevent transmission or reduce the severity of infection. However vaccination could be a potential source of false-positive results in  $^{18}\text{F}$ -FDG PET/CT (Katal et al. 2021).

## Case Presentation

We present the case of a 64-year-old female with well-differentiated appendicular adenocarcinoma associated with peritoneal carcinosis initially treated by surgery and chemotherapy benefited from a  $^{18}\text{F}$ -FDG PET/CT to investigate a peritoneal nodule (Fig. 1). This peritoneal nodule (arrow) visualized on the axial (A) view of CT image showed no increased FDG uptake on the axial (B) PET/CT fused image. The MIP (C) and axial (D) PET/CT fused images detected an intense hypermetabolism on the left axillary lymph nodes up to the left supraclavicular area. The patient revealed she had received a Covid-19 vaccination on the left upper limb 4 days before FDG examination. In order to exclude a Virchow nodule due to her digestive cancer history, we performed a cervical echography with supraclavicular node cytological biopsy sample. Echography (E) showed a 14mm long axis normal lymph node with its central hilum. Cytological analysis revealed activated lymphoid cells without tumour cells.

## Discussion

Several previous reports have demonstrated axillary lymph nodal activation on  $^{18}\text{F}$ -FDG PET/CT following influenza and Covid-19 vaccination (Burger et al. 2011; Shirone et al. 2012; Eifer et al. 2021; Nawwar et al. 2021). This case revealed an atypical extended supraclavicular activation. In the context of

the Covid-19 pandemic and large vaccination programs, questionnaires including vaccine location and timing can help to avoid false-positive lymph node interpretation following  $^{18}\text{F}$ -FDG PET/CT.

## **Conclusion**

Nuclear physicians should be careful when cancers staging and re-staging. This is especially important for patients with breast cancer having been vaccinated on the homolateral upper limb, digestive cancer patients vaccinated on the left side, or with lung or head and neck carcinoma.

## **Declarations**

### **Ethics approval and consent to participate**

As the FDG-PET/CT was part of a routinely performed clinical examination no ethics approval was needed.

### **Consent for publication**

For this case report, the patient has consented to the submission.

### **Availability of data and material**

Not applicable

### **Competing interests**

The authors declare that they have no conflicts of interest or competing interests.

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### **Author's contributions**

Conception and design: VF; BM; DR; FD; CR.

Acquisition of data, analysis and interpretation of data: VF; BM; DR; FD; CR.

Drafting the article and final approval of the revised manuscript: VF; BM; DR; FD; CR.

All authors read and approved the final manuscript.

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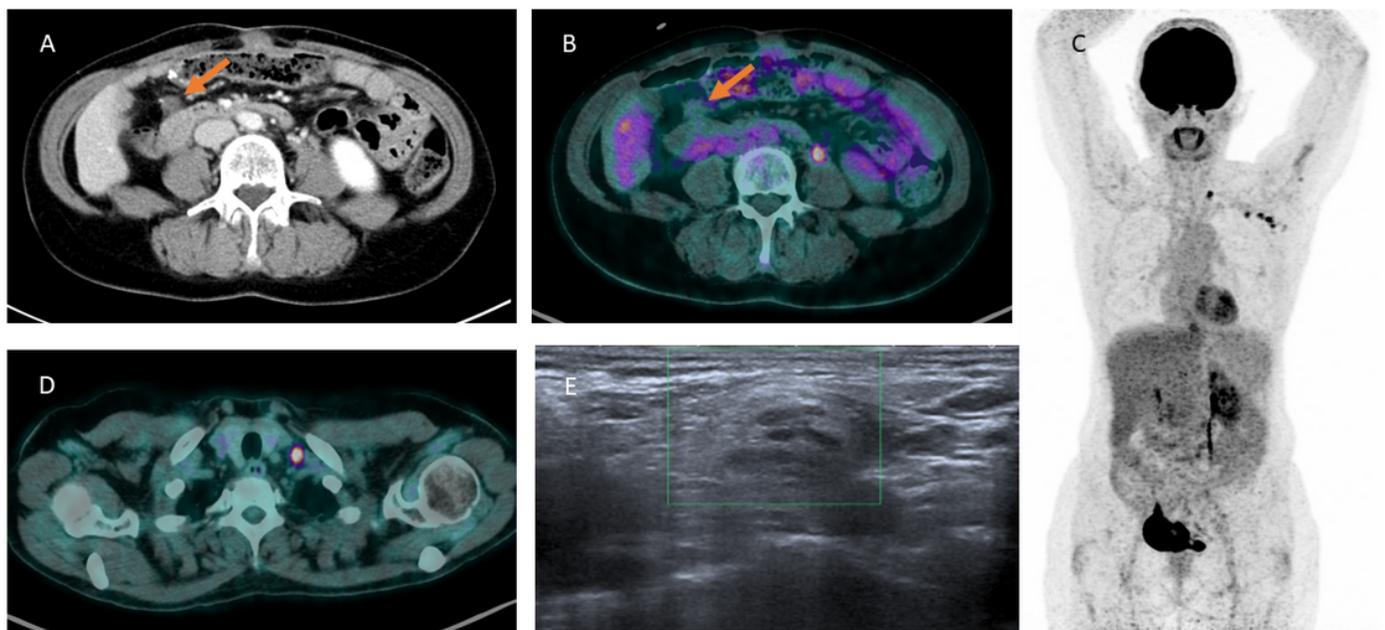
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## Figures



**Figure 1**

CT scan showed a peritoneal nodule (arrow in a) with no increased uptake on fused 18F-FDG PET/CT images (arrow in b). MIP (c) and fused 18F-FDG PET/CT (d) showed with increased uptake on the left

axillary lymph nodes up to the left supraclavicular area. Echography (e) showed a normal supraclavicular lymph node