

# COVID-19 Vaccination Manifesting as Unilateral Lymphadenopathies Detected by $^{18}\text{F}$ -Choline PET/CT

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**Abstract:** A 79-year-old man with a history of prostate adenocarcinoma treated with prostatectomy underwent  $^{18}\text{F}$ -FCH PET/CT for restaging purpose, which was negative for relapse but showed the presence of choline-positive lymph nodes in the left axilla. The patient underwent a COVID-19 vaccination in the left arm 6 days prior. Thus, PET/CT findings were considered as inflammatory lymph nodes. With the current drive of global COVID-19 immunization, this case underlines the importance of knowing vaccination history to interpret correctly the findings and to avoid false-positive reports.

**Key Words:** choline, COVID-19, PET/CT, vaccination

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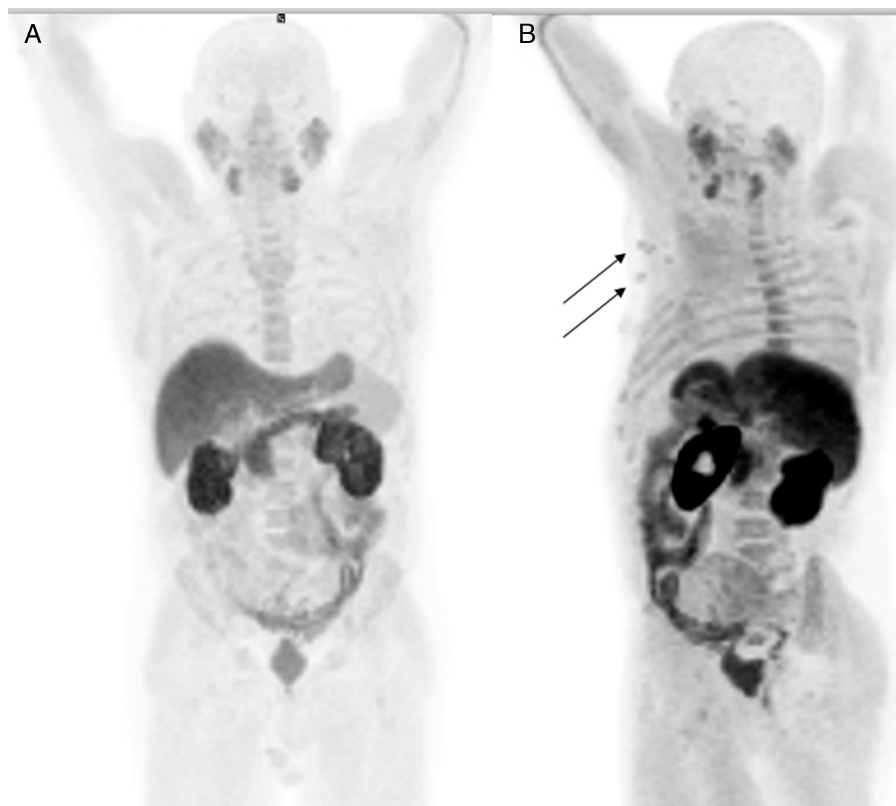
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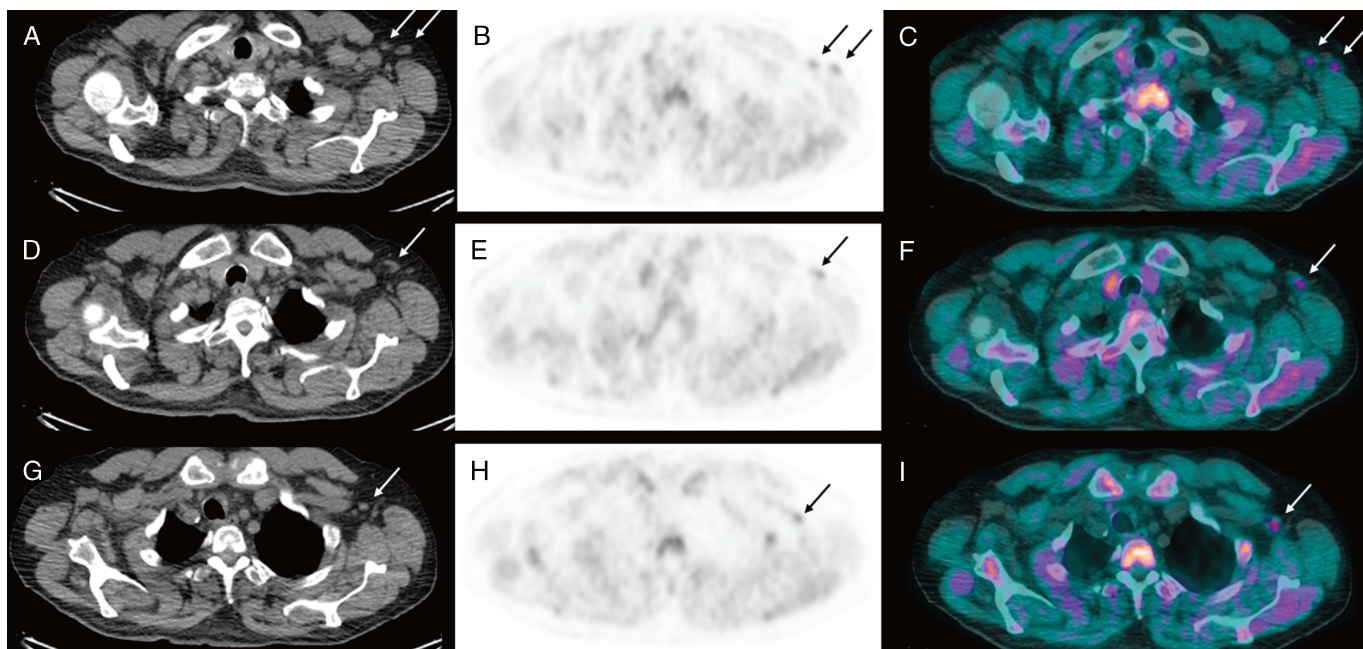
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**FIGURE 1.** A 79-year-old man with a history of prostate adenocarcinoma (Gleason score 4 + 5) treated with prostatectomy underwent a  $^{18}\text{F}$ -fluorocholine ( $^{18}\text{F}$ -FCH) PET/CT for restaging purpose after the increase of prostate-specific antigen (PSA) level (last PSA 1.57 ng/mL; PSA velocity 0.09 ng/mL per month; PSA doubling time 7.8 months). Tracer injection was done via the left antecubital vein.  $^{18}\text{F}$ -FCH PET/CT maximum intensity projection (MIP, anterior view, A) demonstrated no increased uptake corresponding to relapse or localization of disease. However, several moderate uptakes in the left axillary fossa were noted (lateral view, B, black arrows).



**FIGURE 2.** Axial CT (A, D, G), PET (B, E, H), and PET/CT fused images (C, F, I) confirmed the presence of several axillary nodes both superficial and wide with increased uptake. CT appearance of lymph nodes was suspected for inflammatory nature. This patient received the Oxford-AstraZeneca COVID-19 vaccination in the left upper arm 6 days before PET/CT scan and reported only faint left arm pain. Large-scale worldwide COVID-19 vaccination programs are being rapidly deployed starting from health workers and old frail people. Several articles<sup>1–6</sup> reported increased  $^{18}\text{F}$ -FDG uptakes in axillary and subpectoral lymph nodes and deltoid muscle at the same side of the vaccine administration. These findings were interpreted as reactive response due to immune effect after recent vaccination against COVID-19. Also with DOTA peptides, some cases are described.<sup>7–9</sup> Instead, only 1 case of increased radiolabeled choline uptake after vaccination against COVID-19 was described.<sup>10</sup> Our case highlights the possibility to have incidental choline uptake in the axillary nodes after vaccination and underlines the need to pay attention to this finding to avoid incorrect image interpretation and inadvertent upstaging of disease.