^{18}F-FDG Gallbladder Uptake: Observation from a Total-Body PET/CT Scanner

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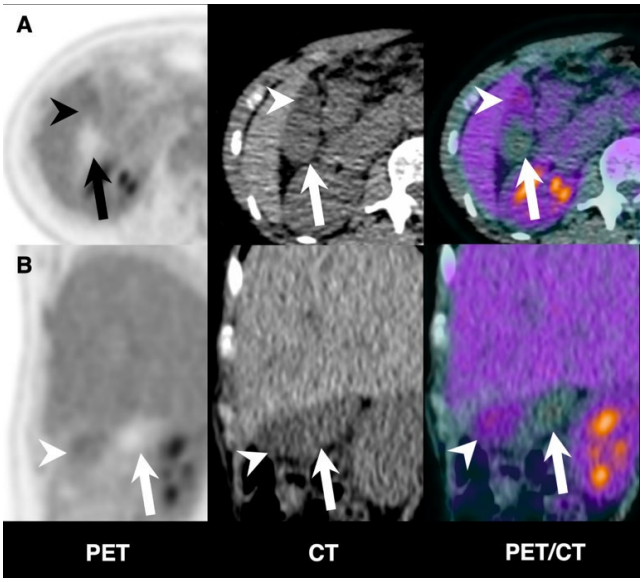
INTRODUCTION: Long axial field of view PET/CT scanners are characterized by higher signal collection efficiency and greater spatial resolution. The gallbladder is not usually visualized as an ^{18}F-FDG-avid structure in routine clinical PET/CT studies, unless affected by an infective, inflammatory, or neoplastic process. In this study we report visualization rates and characteristics of gallbladder ^{18}F-FDG uptake observed in both healthy and oncologic subjects on EXPLORER PET/CT system.

METHODS: Scans from 73 participants (48 healthy and 25 with newly diagnosed lymphoma) who underwent ^{18}F-FDG total-body PET/CT were retrospectively reviewed. Subjects were scanned at multiple timepoints up to 12 hours post-injection. High-fat high-protein meal was provided after the 180-minute timepoint. Gallbladder ^{18}F-FDG uptake was graded using liver uptake as a reference, and the pattern was qualified as present in the wall, lumen, or both. Participants' characteristics were collected to assess for any significant correlation with gallbladder ^{18}F-FDG uptake. CT images were visually assessed for presence of gallbladder stones and biliary sludge.

RESULTS: The detection rate for gallbladder ^{18}F-FDG uptake was 100% at 120- and 180-minute post-injection scans. No uptake was observed after the 180-minute scan in 15 participants imaged up to 12 hours. All 73 subjects showed gallbladder uptake at one or more imaging timepoints. An increase in uptake intensity overtime was observed up until the 180-minute scan, and gallbladder wall uptake was observed at early timepoints whereas luminal activity was the prevalent pattern at delayed timepoints. No significant correlation was found between gallbladder uptake intensity/pattern and subjects' characteristics.

DISCUSSION: The consistent observation of gallbladder ^{18}F-FDG uptake recorded in this study in healthy participants and oncologic subjects was detectable because of the properties of new generation total-body PET/CT scanners.

CONCLUSION: Gallbladder visualization on ^{18}F-FDG total-body PET/CT scans is likely a normal physiologic process and should not be mistaken for any pathology.



Axial (A) and sagittal (B) PET, CT and fused PET/CT images of a 61 y/o healthy female participant, scanned at 90-minute post-injection of 334 MBq of 18F-FDG. Images show distribution of ^{18}F-FDG uptake in the gallbladder: one portion shows uptake with lower attenuation on the corresponding CT (arrowhead), while the other portion shows no uptake and higher attenuation on the corresponding CT (arrow). These findings suggest the presence of different luminal content, suggestive of biliary sludge.