

## Fluid-Fluid Level In The Urinary Bladder On PET-CT

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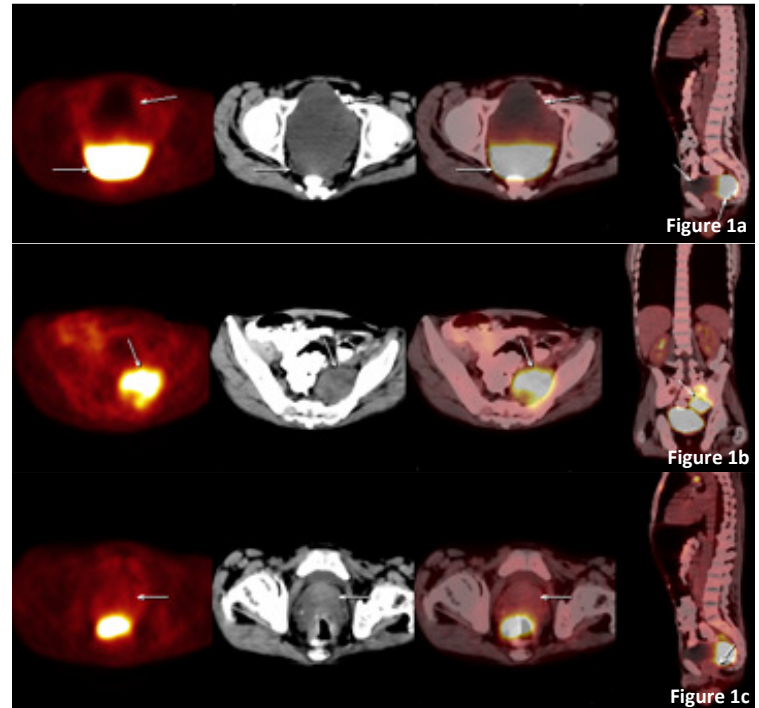
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A 60-year-old male patient with left pelvic mass was referred for FDG PET-CT for metabolic characterization and also possible primary tumour/metastatic lesions. PET-CT images revealed high FDG uptake of the mass (Fig. 1). PET images also showed layering of excreted FDG in posterior region of the distended bladder lumen (Fig. 1) which was in fluid density on CT slices whereas in anterior region of bladder lumen there was FDG-free urine. "Fluid-fluid level" in the urinary bladder was occasionally observed on FDG PET-CT studies. The possible mechanism of this clear demarcation between the urine without FDG and FDG-loaded urine is the delayed mixing of the excreted FDG to the urine in patients with distended urinary bladder due to differences between the gravity of the fluids.

"Fluid-fluid level" in the urinary bladder in FDG PET-CT imaging was described in limited number of studies (1-3). This appearance is occasionally observed in FDG PET-CT studies. Precipitation of the metabolically active cellular components was the mechanism explained by Kumar for this appearance (2). We thought that the possible mechanism for this appearance is the precipitation of the FDG dense urine due to gravity. The gravity differences between the fluids might result in delay of mixing of FDG with non-radioactive urine in patients with distended bladder. Although patients are instructed to void before acquisition, some patients were not able to comply, and distended urinary bladder is sometimes observed due to prostate hyperplasia, neurogenic bladder and the like as in our case. Despite that the clinical utility of this finding might seem limited, this phenomenon should be born in mind as a physiological variants in FDG PET-CT imaging.



**Figure 1a, b and c:** PET-CT images show "fluid-fluid level" in the posterior region of the distended urinary bladder (white arrows) (a). A mass with high FDG accumulation at the left pelvic region was seen possibly invading the sacral neural plexus (b). Prostate hyperplasia was evident on CT images (c).

### Conflict of Interest

No conflict of interest was declared by the authors.

### REFERENCES

1. Zeng W, Sepulveda JN, Nye J, Votaw JR, Nieh PT, Carew J, et al. Posterior bladder layering of excreted 18F-FDG on PET/CT. *Nucl Med Commun* 2010; 31: 859-63.
2. Kumar K. Settlement of [18F]-FDG in the urinary bladder-a new sign. *Nucl Med Commun* 2009; 30: 37-40.
3. Purcell DD, Coakley FV, Franc BL. Anterior layering of excreted 18F-FDG in the bladder on PET/CT: frequency and cause. *AJR Am J Roentgenol* 2007; 189: 96-9.

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