

## Bladder Leiomyoma: A Rare Differential and a Potential Pitfall in the Evaluation for a Bladder Mass in <sup>18</sup>F-Fluorodeoxyglucose-Positron Emission Tomography/Computed Tomography

### Abstract

<sup>18</sup>F-Fluorodeoxyglucose-positron emission tomography/computed tomography (<sup>18</sup>FDG PET/CT) has shown an increasing role in the evaluation of urinary bladder cancer, though benign pathological processes of the urinary bladder can also result in increased FDG uptake. Leiomyomas of urinary bladder are benign mesenchymal neoplasms and a very rare bladder tumor comprising <0.5% of all bladder tumors. Here, we present the low-grade <sup>18</sup>FDG uptake in urinary bladder leiomyoma on PET/CT done for the clinical suspicion of bladder cancer, which can be a rare differential for bladder carcinoma.

**Keywords:** <sup>18</sup>F-fluorodeoxyglucose, bladder leiomyoma, bladder mass, positron emission tomography/computed tomography, pitfall

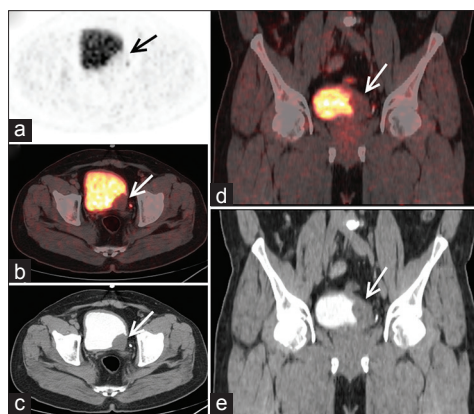
A 65-year-old man presented with lower urinary tract symptoms. Ultrasonography showed the presence of 3.5 cm × 2.3 cm lobulated, hypoechoic lesion in the posterolateral wall of urinary bladder with Grade II prostatomegaly. Contrast-enhanced computed tomography (CT) abdomen revealed a polypoidal soft-tissue thickening (~3.8 cm × 3.3 cm × 2.4 cm) without any calcification involving the left posterolateral wall and the left vesico-ureteral junction. His serum prostate-specific antigen was 3.33 (normal range: 0.2–4.0 ng/ml). Subsequently, the patient underwent <sup>18</sup>F-fluorodeoxyglucose-positron emission tomography/CT (FDG PET/CT) for lesion characterization and staging. FDG PET/CT revealed mildly tracer-avid soft-tissue growth in the urinary bladder suspicious of a low-grade neoplasm [Figure 1]. The patient underwent transurethral resection of bladder tumor and the histopathology revealed features of urinary bladder leiomyoma [Figure 2].

FDG PET/CT is an important investigation in the characterization and evaluation of various malignant conditions and its role in the evaluation of the urological malignancies has recently evolved.<sup>[1]</sup>

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However, the role of FDG-PET/CT in the benign pathologies of urinary bladder is hardly studied. Leiomyomas are rare benign mesenchymal neoplasms of urinary bladder comprising <0.5% of all bladder tumors,<sup>[2]</sup> with only approximately 250 being reported in the literature. In the index study,



**Figure 1:** Fluorodeoxyglucose-positron emission tomography/computed tomography showing mildly tracer-avid (SUV<sub>max</sub> 2.9) soft-tissue growth in the left posterolateral wall of the urinary bladder (shown with arrow) without any definite evidence of abnormal tracer uptake elsewhere in the corresponding axial positron emission tomography/computed tomography (a), axial fused positron emission tomography/computed tomography (b), contrast-enhanced axial computed tomography (c), the corresponding coronal fused positron emission tomography/computed tomography (d), and computed tomography (e)

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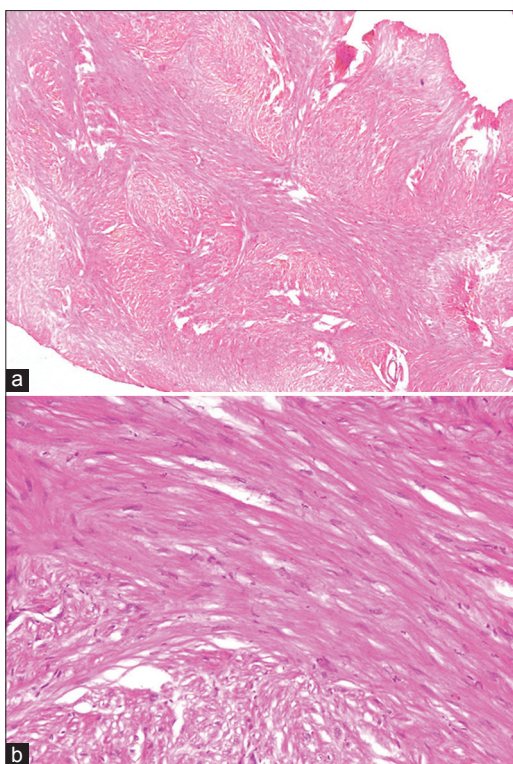
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**Figure 2:** Histopathology of the lesion showing characteristic intersecting fascicular arrangement of spindle-shaped cells (H and E,  $\times 40$ ): a). On further magnification, elongated nuclei having fine delicate chromatin with blunted ends and significant collagenization are present (H and E,  $\times 200$ ): b). No nuclear atypia, mitosis, or necrosis was noted and a diagnosis of leiomyoma was made

low-grade tracer-avid urinary bladder mass in FDG PET/CT and initial radiological investigations suggestive of malignant mass turned out to be urinary bladder leiomyoma in histopathology. With ever-increasing utility of PET/CT in oncology, it becomes equally important to have knowledge about different pathological disorders that may be seen in FDG studies. Along with the reported differential diagnosis of a bladder mass, adenocarcinoma of the bladder,<sup>[3]</sup> transitional cell/urothelial cancer,<sup>[4]</sup> leiomyosarcoma,<sup>[5]</sup> high-grade lymphoma,<sup>[6]</sup> etc., show high-grade FDG uptake. Among the differentials of a variably FDG-avid bladder mass, such as mucinous adenocarcinoma of bladder,<sup>[7]</sup>

low-grade paraganglioma,<sup>[8]</sup> and low-grade preinvasive transitional cancer,<sup>[9]</sup> leiomyoma of the urinary bladder can also mimic as bladder cancer as seen in the index case. Thus, FDG uptake in a bladder tumor may not differentiate leiomyoma from urinary bladder malignancy.

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### Conflicts of interest

There are no conflicts of interest.

### References

1. Sharma A, Mete UK, Sood A, Kakkar N, Gorla AK, Mittal BR, *et al.* Utility of early dynamic and delayed post-diuretic  $^{18}\text{F}$ -FDG PET/CT  $\text{SUV}_{\text{max}}$  in predicting tumour grade and T-stage of urinary bladder carcinoma: Results from a prospective single centre study. *Br J Radiol* 2017;90:20160787.
2. Mendes JE, Ferreira AV, Coelho SA, Gil C. Bladder leiomyoma. *Urol Ann* 2017;9:275-7.
3. Chakraborty D, Mittal BR, Kashyap R, Mete UK, Narang V, Das A, *et al.* Role of fluorodeoxyglucose positron emission tomography/computed tomography in diagnostic evaluation of carcinoma urinary bladder: Comparison with computed tomography. *World J Nucl Med* 2014;13:34-9.
4. Jadvar H, Quan V, Henderson RW, Conti PS.  $^{18}\text{F}$ -fluorodeoxyglucose PET and PET-CT in diagnostic imaging evaluation of locally recurrent and metastatic bladder transitional cell carcinoma. *Int J Clin Oncol* 2008;13:42-7.
5. Makis W, Rakheja R, Nahal A, Hickeson M, Lisbona R. Urinary bladder leiomyosarcoma: Staging with  $^{18}\text{F}$ -FDG PET/CT. *Clin Nucl Med* 2013;38:e218-22.
6. Mantzarides M, Papathanassiou D, Bonardel G, Soret M, Gontier E, Foehrenbach H, *et al.* High-grade lymphoma of the bladder visualized on PET. *Clin Nucl Med* 2005;30:478-80.
7. Li X, Liu S, Yao S, Wang M. A rare case of urachal mucinous adenocarcinoma detected by  $^{18}\text{F}$ -FDG PET/CT. *Clin Nucl Med* 2015;40:282-5.
8. Manohar K, Mittal BR, Bhattacharya A, Kashyap R, Aggarwal MM, Mandal AK, *et al.* A rare case of malignant urinary bladder paraganglioma with distant metastases demonstrated by  $^{18}\text{F}$ -FDG PET/CT. *Clin Nucl Med* 2012;37:e148-9.
9. Tagliabue L, Russo G, Lucignani G.  $^{18}\text{F}$ -FDG PET/CT in bladder cancer. *Clin Nucl Med* 2016;41:e522-4.