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Incidental Uptake of ^{18}F -Fluciclovine by Type AB Thymoma

Vishal Somnay, MD,* and Ishani Dalal, MD†

Abstract: Biochemical recurrence of prostate cancer, detected by a rising PSA, may reflect intraprostatic or extraprostatic recurrence. ^{18}F -Fluciclovine (Axumin), a synthetic amino acid substrate in tumor metabolism, has frequently been used for to localize recurrent prostate cancers. We present a 71-year-old man with biochemical recurrence of prostate cancer but no convincing imaging findings on ^{18}F -fluciclovine PET/CT. Of note, however, was an incidental uptake within the anterior mediastinum, which was found on biopsy to be a type AB thymoma. With this, we stress that awareness of false-positive uptake patterns is crucial for accurate diagnosis of recurrent prostate cancer.

Key Words: ^{18}F -Fluciclovine PET/CT, thymoma, anterior mediastinal mass
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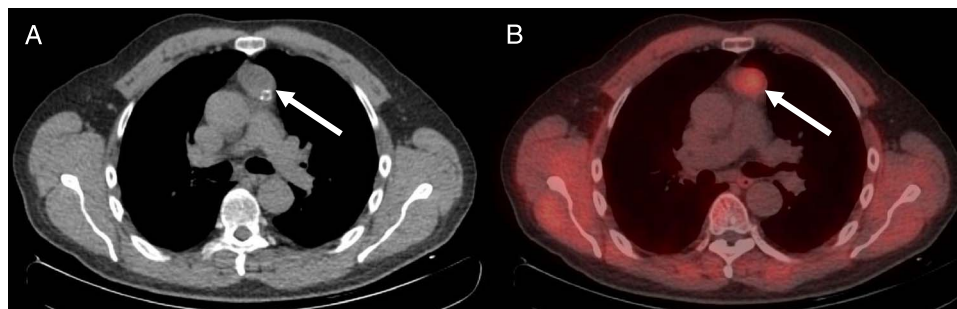


FIGURE 1. A 71-year-old man with a history of biochemically recurrent prostate cancer underwent ^{18}F -fluciclovine PET/CT for metastatic localization. Axial cross-section CT (A) of the patient's thorax showed a 9-cm anterior mediastinal soft tissue mass with an area of internal calcification, likely representing a teratoma or thymoma. The mass appeared well-encapsulated and multiloculated with cystic changes. ^{18}F -fluciclovine PET/CT (B) demonstrated diffusely increased uptake by the mass with SUV_{max} of 3.1 (blood pool $\text{SUV}_{\text{max}} = 1.2$, $\text{SUV}_{\text{avg}} = 0.89$; bone marrow $\text{SUV}_{\text{max}} = 2.5$, $\text{SUV}_{\text{avg}} = 1.4$). Excisional biopsy revealed tumor cells in solid sheets with morphological overlap between type A and type B3 thymoma, favoring type A, with some areas of type B2. Immunohistochemically, the cells were TdT negative and variable for CD-20 and Ki-67 (highest focus = 10%). Hence, the tumor was best classified as type AB (type B2 for the B component) with coexisting type B3. Because its approval for detection of recurrent prostate cancer, ^{18}F -fluciclovine has demonstrated focal uptake in many nonprostatic neoplasms among various organ systems.¹⁻⁸ Uptake can also occur in benign infectious and inflammatory processes, such as prostatic hyperplasia, osteoid osteomas, and acute appendicitis.⁹⁻¹² A recent report by Robertson et al¹³ presents a case of ^{18}F -fluciclovine uptake in a thymoma, and Fallanca et al¹⁴ present a thymoma picked up incidentally on ^{11}C -choline PET/CT.^{13,14} Interestingly, the L-type amino acid transporter involved in cellular uptake of ^{18}F -fluciclovine is associated with aggressive cancers but is notably absent in thymomas, suggesting the presence of an alternative mechanism of cellular uptake in these rare cases.^{15,16} In addition to considering thymomas as source of false-positives, our case sheds light on the further expanding utility of ^{18}F -fluciclovine in detection of nonprostatic neoplasms.¹⁷