

Prostate specific membrane antigen PET/CT can detect a variety of benign and malignant lesions in addition to prostate cancer

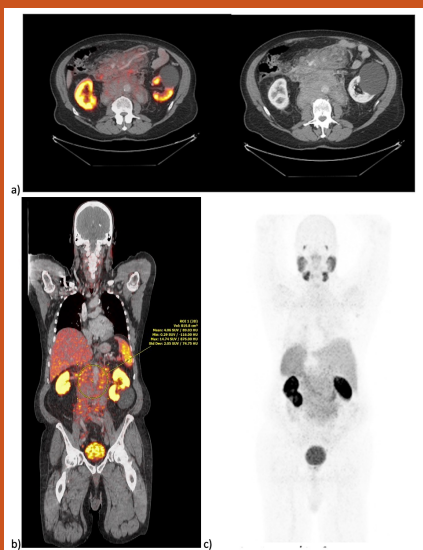


Fig 1: 78M initial staging PSMA PET/CT for prostate cancer, with pathology resulting in CD10-positive, kappa-restricted B-cell lymphoma. Retroperitoneal infiltrative nodal conglomerate with PSMA uptake. a) Fused axial image and axial contrast enhanced CT, b) fused coronal image with SUV max ROI (SUV Max: 14.7), and c) Maximum intensity projection (MIP).

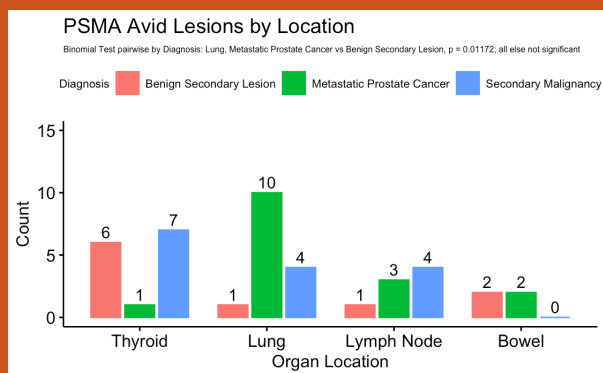


Fig 2: The 4 most common locations of incidental lesions in this study. Lesions in the lung are more likely to be metastatic prostate cancer than benign ($p = 0.01172$), as well as more likely to be any metastatic than benign ($p = 0.0009766$).

Detection of incidental malignancy on Prostate Specific Membrane Antigen (PSMA) PET/CT imaging: a review of 2,054 sequential studies at an academic medical center

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Background

Prostate specific membrane antigen (PSMA) is a transmembrane glycoprotein that has been shown to be highly expressed in prostate tissue, making it a useful target for prostate cancer imaging. However, PSMA PET radioligand uptake has also been described in case reports of non-prostate cancer lesions, including various non-prostate malignancies and benign processes.

Results

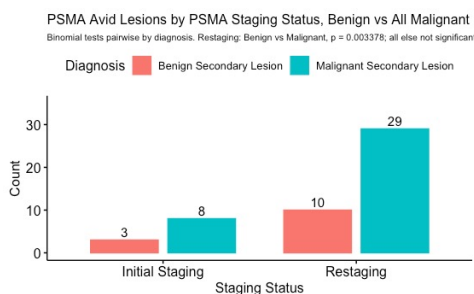


Fig 3: Incidental lesions divided by PSMA imaging indication and biopsy result. Lesions from imaging for biochemical recurrence are more likely to be metastatic than benign

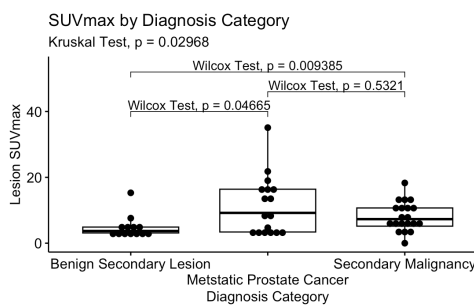


Fig 4: SUVmax of incidental lesions. Benign incidental lesions detected during PSMA imaging are likely to be less avid than either type of metastatic lesion

Methods

- A retrospective review of UCSF 68Ga-PSMA-11 (PSMA) PET/CT studies completed from December 2015 - April 2022 was performed (1873 patients)
- Studies with PSMA PET/CT reports that noted incidental PSMA uptake not definitively related to prostate cancer or known benign processes (245 patients)
- PSMA PET/CT studies which had definitive pathology results within the UCSF EMR corresponding to the PSMA-avid lesions were selected for further analysis (49 patients)

Images were re-reviewed by a junior and a senior radiologist to determine the anatomic location, size, SUVmax, mPSMA score, and mTNM score. Statistical correlations assessed by binomial and multinomial tests for categorical data, and Wilcoxon and Kruskal-Wallis tests for continuous data.

Demographics Category	Median	Count	%	Range	SD
Age at PSMA PET/CT	72			58 - 92	7.32
PSA at PSMA PET/CT	3.555	48		0.06 - 103	18.63
Second malignancy known prior to PSMA PET/CT		10	20%		
Repeat PSMA PET/CT		4	8%		

Discussion

PSMA PET/CT can detect multiple types of metastatic and benign non-prostate cancer lesions, while suggesting if a lesion is malignant or benign. Incidental lesions located in the lung and incidental lesions detected on PSMA PET/CT imaging for biochemical recurrence were associated with a malignant process over a benign one. Incidental lesions with a higher standard uptake value (SUV)max were also associated with a malignant process. Incidental lesions diagnosed as secondary metastases were likely to be larger than lesions diagnosed as prostate cancer metastases.

Limitations inherent to this retrospective review from a single center include selection bias due to the local patient population, as well as selection bias due to the reliance on the availability of pathology reports from completed biopsies.