⇥ IMAGING

Predicting ⁶⁸Ga-PSMA-PET–CT positivity for recurrent disease

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Using ^{68}Ga-labelled prostate-specific membrane antigen (PSMA) ligand-positron-emission tomography (PET)–CT imaging can improve detection rates of recurrent prostate cancer. The largest study to date, published in *European Urology*, shows that using this imaging modality to detect disease in patients with early biochemical recurrence after radical prostatectomy could influence treatment decisions in these men. Two nomograms for predicting positive findings using this imaging modality have been developed to help select men who might benefit from undergoing this procedure.

In total, 272 patients who had hormone-sensitive biochemical recurrence of prostate cancer, had received radical prostatectomy as their primary treatment, and had serum PSA values between 0.2 and 1.0 ng/ml at the time of imaging were included in the study. This cohort was split into two subgroups: very-low PSA values (0.2–0.5 ng/ml) and low PSA values (>0.5–1.0 ng/ml).

^{68}Ga-PSMA-PET–CT imaging showed positivity for prostate cancer in 65% of men, but the detection rate was lower in the very-low PSA values subgroub than in the low PSA values subgroup (55% versus 74%). Lesions were mainly detected in the pelvic or retroperitoneal lymph nodes, and local recurrence and bone metastases were also commonly observed.

On univariate analysis, PSA value, locally advanced primary tumour (pT ≥3a), initial pN+ disease, grade group ≥4, previous radiotherapy, and concurrent androgen deprivation therapy (ADT) at the time of imaging were predictive of positive findings on ^{68}Ga-PSMA-PET–CT imaging. However, the only significant independent predictors were PSA value and concurrent ADT on multivariable analysis; initial grade group showed a clear, but nonsignificant association.

Two nomograms for predicting positivity on ^{68}Ga-PSMA-PET–CT imaging were developed based on these data. The first, termed a compact nomogram, includes the three most associated predictors of positivity (PSA value, concurrent ADT, and initial grade group). The second, called a comprehensive nomogram, includes all the clinical predictors that were gathered during this study. To determine the estimated probability of a positive finding in both nomograms, the points for each variable are summed to give a total score.
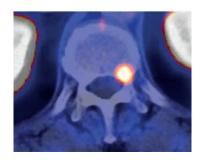
"The most important points regarding this study are that we have shown that ^{68}Ga-PSMA-PET–CT has good detection rates for recurrent prostate cancer after radical prostatectomy, even at low PSA levels," explains Tobias Maurer, one of the senior authors on the paper. "These data are more robust than previous reports owing to the number of patients included in this study," he continues. "Management could be changed for a considerable number of patients based on the findings of ^{68}Ga-PSMA-PET–CT imaging," he concludes.

These data show that ^{68}Ga-PSMA-PET–CT is a robust method for detecting recurrent disease in men who have undergone radical prostatectomy, even at low PSA levels. Two nomograms developed using clinical information gathered during this study could help select men who would benefit from undergoing this imaging modality.

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ORIGINAL ARTICLE Rauscher, I. *et al.* Efficacy, predictive factors, and prediction nomograms for ^{68}Ga-labeled prostate-specific membrane antigen–ligand positron-emission tomography/computed tomography in early biochemical recurrent prostate cancer after radical prostatectomy. *Eur. Urol.* https://doi.org/10.1016/j.eururo.2018.01.006 (2018)
FURTHER READING Maurer, T. *et al.* Current use of PSMA–PET in prostate cancer management. *Nat. Rev. Urol.* **13**, 226–235 (2016)

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