Prostate

Timing of Ga68-PSMA PETCT and patterns of recurrence after prostate radiotherapy: Implications for potential salvage

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PURPOSE

To study patterns of recurrence in Ga68-PSMA PETCT at rising serum PSA after radical radiotherapy for non-metastatic prostate cancer.

METHODS

Among patients with non-metastatic prostate cancer treated with radical external beam radiotherapy and androgen deprivation therapy, those who underwent Ga68-PSMA PETCT for rising PSA during follow up were analysed. Patterns of recurrence in Ga68-PSMA PETCT were studied. Extra-prostatic recurrences ≤5 were considered oligometastases. Local and oligometastatic recurrences were deemed suitable for focal salvage therapy. Probabilities of identifying recurrent lesion and potentially salvageable recurrences in Ga68-PSMA PETCT in relation to PSA were calculated.

RESULTS

Total 114 patients were included (69% high-risk). Radiotherapy was hypofractionated in 57% (moderate 40%, extreme 17%), with median prostate EQD2 78.5 Gy. Median time from radiotherapy to Ga68-PSMA PETCT was 4.3 years (IQR 2.4-6.4), with median PSA 4.7 ng/mL (IQR 2.6-10.7) at scan. Uptake suggesting recurrence was observed in 91.2% patients, with positivity of 75%, 87%, 89%, and 100% at PSA thresholds ≤2, ≤5, ≤10, and >10 ng/mL respectively. Probability of detecting recurrence in Ga68-PSMA PETCT increased with higher PSA at scan (AUC = 0.82). Uptake was local in 20 (17.5%), oligometastatic in 39 (34.2%), and polymetastatic in 45 (39.5%) patients. Recurrence was potentially salvageable in 59/104 (56.7%) patients, being 67% at PSA ≤2 ng/mL but only 38% at PSA >10 ng/mL. Probability of recurrence being potentially salvageable declined with increasing PSA at scan (AUC = 0.68).

CONCLUSION

Early Ga68-PSMA PETCT for rising PSA after definitive prostate radiotherapy detected majority of recurrent lesions and identified oligorecurrences amenable to focal salvage therapy.