Delineating biochemical failure with 68Ga-PSMA-PET following definitive external beam radiation treatment for prostate cancer.


BACKGROUND AND PURPOSE: We investigated the role of $^{68}$Ga-PSMA-PET (PSMA) to determine the location of disease recurrence in those with a rising PSA following definitive external beam radiation treatment (EBRT).

MATERIALS AND METHODS: 538 men were treated with image guided EBRT to a dose of 78 or 82 Gy between 2007 and 2014. Patients at least 24 months post EBRT with biochemical failure (nadir+2) underwent PSMA scanning. Local recurrence (LR) was defined as increased uptake within the prostate or seminal vesicles. Distant disease included lymph node (LN), bone or visceral metastases.

RESULTS: 419 men formed the study cohort. Median follow-up was 50 months, 70 patients (17%) had biochemical failure (BF), 13 of whom have died. Of the 57 survivors, 5 had metastases detected on conventional scans; 2 were lost to follow up. 48 men (of 50 candidates) underwent PSMA; in all cases, the PSMA was unequivocally positive. Of the 48 positive scans, 25 patients (52%) failed beyond the prostate - 5 in bones, 16 LN, 3 in both, and 1 in the lungs. Fifteen men (31%) failed within the gland and in either LN (11), bones (3), or both (1). Eight (17%) had an isolated LR, which represents 2% of patients managed with definitive EBRT and followed for at least 2 years.

CONCLUSIONS: PSMA was positive in all patients with BF. Site of failure following dose-escalated EBRT was generally distant. Isolated LR (on PSMA) occurred in only 8 of 419 patients post-EBRT.

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KEYWORDS: Biochemical failure; PSMA-PET; Prostate cancer

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