Abstract:

OBJECTIVE: To evaluate [(11)C]choline positron emission tomography/computed tomography ([(11)C]choline PET/CT) for the detection of a biochemical recurrence of prostate cancer after radical prostatectomy. METHODS: Retrospective analysis of [(11)C]choline PET/CT performed in 41 consecutive prostate cancer patients with a rising PSA. The mean time to biochemical relapse was 24 months. PSA levels were determined at time of examination, and patients received either a targeted biopsy or surgery. Histopathology reports served as reference for the evaluation of the [(11)C]choline PET/CT findings. RESULTS: Mean PSA in [(11)C]choline PET/CT positive patients was 3.1 ng/ml (median 2.2 ng/ml, range 0.5-11.6 ng/ml) and 0.86 ng/ml in [(11)C]choline PET/CT negative patients (median 0.83 ng/ml, range 0.41-1.40 ng/ml). Six of 12 patients with PSA < 1.5 ng/ml [(11)C]choline PET/CT revealed a pathological uptake. Histopathology was positive in 6/12 patients in this group. At PSA levels ranging from 1.5 to 2.5 ng/ml all [(11)C]choline PET/CT were positive (n = 16), a positive histology was found in 12/16 patients (75%) and at PSA 2.5-5 ng/ml [(11)C]choline PET/CT was positive in 8/8 patients, confirmed by histology in 7/8 patients. Finally, at PSA higher than 5 ng/ml [(11)C]choline PET/CT identified 5/5 patients positive all confirmed by histology. The sensitivity
of [(11)C]choline PET/CT for the detection of recurrence at PSA< 2.5 ng/ml was 89% with a positive predictive value of 72%. CONCLUSION: [(11)C]choline PET/CT is useful for re-staging of prostate cancer in patients with rising PSA even at levels below 1.5 ng/ml. Our study confirms results from other published studies on [(11)C]choline PET/CT in prostate cancer relapse.