Postradiotherapy prostate biopsies: what do they really mean? Results for 498 patients.

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Abstract

PURPOSE: Postradiotherapy (RT) prostate biopsies are prone to problems in interpretation. False negatives due to sampling error, false positives due to delayed tumor regression, and indeterminate biopsies showing radiation effect in residual tumor of uncertain viability are common occurrences.

METHODS AND MATERIALS: A cohort of 498 men treated with conventional RT from 06/87-10/96 were followed prospectively with systematic transrectal ultrasound (TRUS)-guided post-RT prostate biopsies, starting 12-18 months after RT. If there was residual tumor but further decline in serum prostate-specific antigen (PSA), biopsies were repeated every 6-12 months. Patients with negative biopsies were rebiopsied at 36 months. Residual tumor was evaluated for RT effect and proliferation markers. The 498 men had 978 biopsies. Median time of the first biopsy (n = 498) was 13 months, biopsy #2 (n = 342) 28 months, biopsy #3 (n = 110) 36 months, biopsy #4 (n = 28) 44 months, and biopsy #5 (n = 4) 55 months. Median follow-up is 54 months (range 13-131). One hundred seventy-five patients (34%) had prior hormonal therapy for a median of 5 months (range 1-60).

RESULTS: Clinical stage distribution was T1b: 46; T1c: 50; T2a: 115; T2b/c: 170; T3: 108; T4: 11; Tx: 1. Distribution by Gleason score was: 28% Gleason score 2-4; 42%: 5-6; 18%: 7; and 12%: 8-10. Seventy-one men have died, 26 of prostate cancer and 45 of other causes. Actuarial failure-free survival by T stage at 5 years is T1b: 78%; T1c: 76%; T2a: 60%; T2b/c: 55%; T3: 30%; and T4: 0%. Actuarial freedom from local failure at 5 years is T1b: 83%; T1c: 88%; T2a: 72%; T2b/c: 66%; T3: 58%; and T4: 0%. The proportion of indeterminate biopsies decreases with time, being 33% for biopsy 1, 24% for biopsy 2, 18% for biopsy 3, and 7% for biopsy 4. Thirty percent of indeterminate biopsies resolved to NED status, regardless of the degree of RT effect, 18% progressed to local failure, and 34% remained as biopsy failures with indeterminate status within the time frame of this report. Positive staining for proliferation markers was associated with both subsequent local failure and also any type of failure. In multivariate analysis, only PSA nadir (p = 0.0002) and biopsy status at 24-36 months (p = 0.0005) were independent predictors of outcome.

CONCLUSIONS: Post-RT prostate biopsies are not a gold standard of treatment efficacy, but are an independent predictor of outcome. Positive immunohistochemical staining for markers of cellular proliferation is associated with subsequent local failure. Indeterminate biopsies, even when showing marked RT effect, cannot be considered negative.