

Value of technetium scintigraphy and iodine uptake measurement during follow-up of differentiated thyroid cancer

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Measurement of serum thyroglobulin (Tg) levels and I-131 whole body scintigraphy (WBS) are used in the follow-up of patients with differentiated thyroid cancer (DTC). This study was designed to evaluate the significance of persistent I-131 uptake in the thyroid bed in patients with DTC following surgery and/or radioactive iodine ablation. Tc-99m thyroid scintigraphy (TS) and I-131 thyroid uptake (IU) were also performed to determine their clinical impact on patient management. **Patients and Methods:** Sixty-two non-metastatic patients (14 men, 48 women) with a mean age of 44 years (range: 16–75) who had undergone surgical thyroidectomy for DTC were evaluated prospectively. All patients had undergone technetium and iodine scintigraphy (IS). Although serum Tg levels were measured in all patients, IU was available in 36. **Results:** Tg values were in the range of 0.2–24 ng/ml (median: 0.2 ng/ml) when patients were in the hypothyroid state. I-131 WBS detected residual tissue in the neck in 30 patients (48%); however TS was positive in only 12 (19%). I-131 uptake in the thyroid bed ranged from 0 to 14% (median: 0.1%). Twelve of 13 patients with positive IS and negative TS had uptake values $\leq 0.3\%$ ($p < 0.00001$). When IU values were $\leq 0.3\%$, 54% of our patients did not have any uptake in the thyroid bed on TS or IS, whereas when IU was $>0.3\%$, 80% of patients had neck uptake on both TS and IS ($p < 0.00001$). **Conclusion:** The results of this study demonstrate that the concordance of IS and TS depends on the IU level after suspension of replacement therapy. Measurements of IU and TS are of considerable value in evaluating patient response to therapy and will substantially reduce the need for repetitive radioiodine scans and unnecessary treatment doses in patients with undetectable Tg values.

Key words: differentiated thyroid cancer, thyroid scintigraphy, I-131 whole body scintigraphy, thyroglobulin