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Radioiodine Remnant Ablation in Low-Risk Differentiated Thyroid Cancer

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Abstract

Objective: Evaluate the success rate of first high dose 100 mCi (3.7 GBq) radioiodine remnant ablation (RRA) in low-risk differentiated thyroid cancer (DTC) patients after surgery and determine factors influencing the success.

Material and Method: Between 1994 and 2011, a retrospective analysis was performed of 166 low-risk DTC patients after surgery (age range 18-76 years, mean age 38 years, 147 women and 19 men) with primary tumor >1 cm of diameter, stage 52 pT1pN0, 85 pT2pN0, 12 pT3pN0, and 17 pTxN0 underwent high dose 100 mCi (3.7 GBq) RRA. Successful RRA was defined as visually undetectable thyroid bed activity or elsewhere on the first follow-up whole body scan (WBS) six to 12 months after RRA and the stimulated thyroglobulin (st-Tg) levels <2 ng/mL at the same time of follow-up WBS and without interfering thyroglobulin antibodies (TgAb). Additional I-131 treatment was individualized depending on clinical characteristics with 100 to 150 mCi (3.7-5.5 GBq) I-131 six to 12 months intervals to achieve no thyroid bed uptake.

Results: Successful RRA was achieved in 122 of the 166 patients (73.5%). Failure by both criteria was seen in nine patients (5.4%). Of the 44 patients with ablation failure, additional I-131 treatment was individualized in 26 patients (59.1%). St-Tg levels at time of ablation and tumor size had significance influences on the success of RRA. The st-Tg levels at time of ablation were 7.5±11.5 ng/mL (0.1-80.3) in the ablation success group as compared with the ablation failure group of 24.1±24.9 ng/mL (1.3-97), p-value <0.001. Patients with ablation failure group had statistical significance of average tumor size greater than patients with ablation success group (3.2±1.1 and 2.7±1.1 cm), p-value = 0.012.

Conclusion: The efficacy of first high dose RRA in low-risk DTC after surgery shows comparable rates with those reported in the literature. The two factors influencing ablation success are st-Tg levels at time of ablation and tumor size.

Keywords: Differentiated thyroid carcinoma, Remnant ablation, Thyroglobulin, Radioactive iodine, Whole body scanning

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