



Radiofrequency Ablation Therapy in Recurrent Thyroid Cancer with Lymph Node Metastasis: A Case Report

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Thyroid cancer is the fourth most common cancer among Taiwanese women. The life-long recurrence rate of differentiated thyroid cancer (including papillary and follicular types) can reach up to 30%. Several treatment options have been proven effective, but they still have some shortcomings. Radiofrequency ablation (RFA) therapy is effective and safe for metastatic diseases. We present a case of recurrent thyroid cancer with a metastatic lymph node successfully treated by a single RFA session. We believe that RFA can be addressed in treating patients with recurrent thyroid cancer and lymph node metastasis.

Key words: radiofrequency ablation therapy (RFA), recurrent thyroid cancer

Introduction

The age-adjusted incidence rate of thyroid cancer among Taiwanese women was 8.74 per 100,000 women from 2000 to 2006, increased to 27.8 per 100,000 women in 2018, and is ranked the fourth most common cancer among Taiwanese women.¹ With the long survival rate and high incidence rate of differentiated thyroid cancer, the life-long recurrence rate of differentiated thyroid carcinoma (including papillary and follicular types) can reach up to 30%.² To date, surgery is still the choice treatment for recurrent diseases, but the high risks of complications such as hoarse-

ness (6.5%), hypocalcemia (4.4% – 8.7%), or nerve injury (12%) are of great concern.³⁻⁵ With improved percutaneous ethanol injection therapy (PEIT) and radiofrequency ablation (RFA) in treating primary thyroid tumors, the American Thyroid Association has suggested that PEIT and RFA may be alternative treatments for recurrent disease in high-risk patients or those who refuse surgery.⁶ Here, we present a case of a metastatic lymph node in a patient with thyroid cancer that was successfully treated with one RFA session.

Case Report

A 51-year-old male underwent total thy-

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roidectomy for papillary thyroid carcinoma in June 2019 (T2(m)N1aM0). Two months after the surgery, the patient received remnant ablation therapy with I^{131} (120 mCi). The serum thyroglobulin level was 10.39 ng/mL before I^{131} ablation. Single-photon emission computed tomography showed increased uptake at the thyroglossal duct remnant, and a right neck level-III lymph node was detected (Fig. 1).

Follow-up ultrasonography (US) four months later after radioiodine ablation revealed a round level-III lymph node at the right neck (measured greatest diameter from 10.8 to 11.5 mm at different cuts) (Fig. 2) and the thyroglobulin level elevated to 14.33 ng/mL. Fine-needle aspiration cytology revealed the tumor to be metastatic papillary carcinoma. The patient was referred to a general surgeon for right neck lymph node dissection in February 2020, and several level III lymph nodes were removed, which were all negative for malignancy. However, the metastatic lymph node could not be removed safely, and it was still found

on post-operative ultrasonography at level III in the right neck with positive cytology, as the elevated thyroglobulin level (14.33 ng/mL). The patient refused our suggestion of surgical intervention again and asked about RFA for the metastatic lymph node. He received one RFA session (Fig. 3) smoothly with no complications in May 2020. The serum thyroglobulin level dropped to < 0.2 ng/mL one month after the RFA procedure. The patient received a second dose of I^{131} (150 mCi) four months after RFA (Fig. 4). The right neck lymph node metastasis disappeared, and the serum thyroglobulin level was maintained at the normal limit (< 0.2 ng/mL). After completing the treatment course, the patient was followed for 6 months and revealed no evidence of local recurrence by ultrasonography or computed tomography.

Discussion

According to a recent review article update of radiofrequency ablation of treating

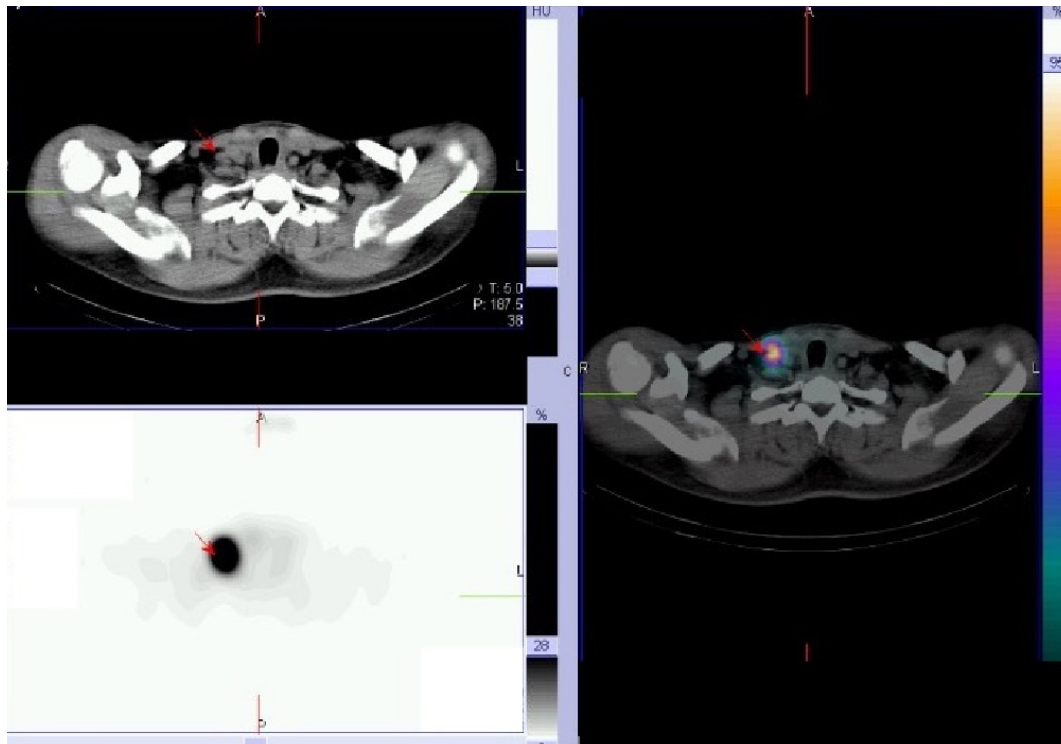


Fig. 1 I^{131} whole-body cancer workup with neck single-photon emission computed tomography/computed tomography seven days after taking 120 mCi of the agent revealed multiple foci of increased radioiodine uptake in the midline of the anterior neck (thyroglossal duct remnant) and right neck (level III).

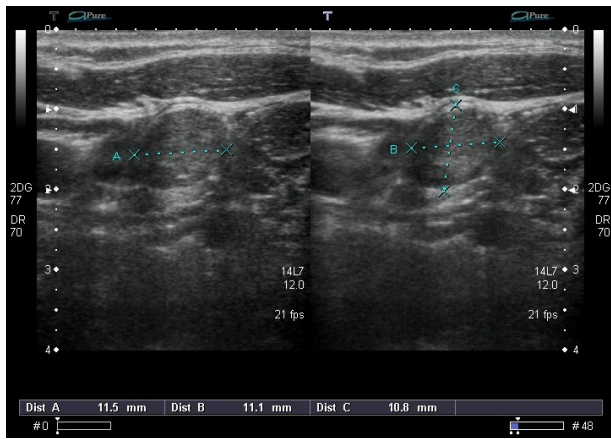


Fig. 2 Ultrasonography was performed four months after radioiodine ablation and revealed a round lymph node at level III. The greatest measured diameter was 11.5 mm.

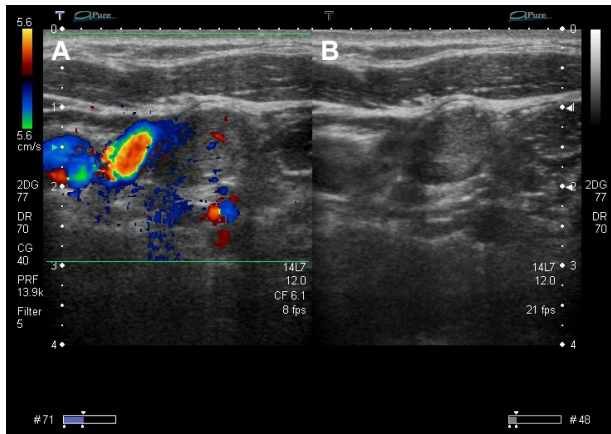


Fig. 3 Ultrasonography before and after radiofrequency ablation therapy. The left image (A) shows high intranodular vascularity before the treatment, while the right image (B) shows much less vascularity in the lymph node.

benign and malignant thyroid nodules⁷ and American Thyroid Association Guideline,⁶ we knew the first choice of recurrent thyroid cancer management is surgical intervention. However, revision surgery for recurrent thyroid cancer is challenged due to scarring and adhesion in the tissue bed. The surgical complication is high. Thereafter, alternative therapy such as radiofrequency ablation and ethanol therapy may be used at high surgical risk patients or those refusing repeat surgical intervention. Previous reports have shown RFA to be an effective and safe procedure for recurrent diseases. Significant tumor volume reduction has been reported in different case series, ranging from 56%⁸ to 93%.⁹ However, RFA is not complication-free: transient voice-change or skin burns have been reported, but the risk of hypocalcemia after the procedure was lower compared to surgery.⁵ The total complication rate of RFA was reportedly 3.7%¹⁰ – 10.4%,¹¹ which is less than that in patients undergoing reoperation 19.6%¹⁰ – 41.6%.¹¹ Both RFA and alcohol injection have low complication rates, but RFA achieves better tumor volume reduction and is associated with a lower tumor recurrence rate.

RFA results in a mean volume reduction of 56%⁸ – 93%,⁹ compared to 37.5%¹² – 96%¹³ with ethanol ablation. The local recurrence rate

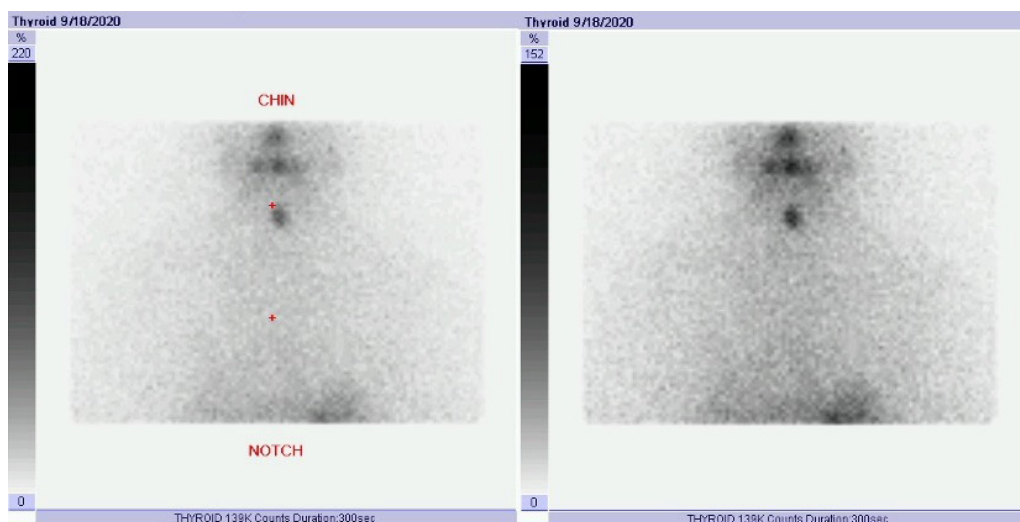


Fig. 4 I^{131} whole-body single-photon emission computed tomography/computed tomography seven days after taking 150 mCi of the agent revealed a focal area of increased radioactivity uptake in the neck region (thyroglossal duct remnant). The metastatic lymph node disappeared after radiofrequency ablation.

with RFA was about 0%¹⁴ – 25%⁹ compared to 3.2%¹³ – 33%¹⁵ with ethanol ablation. In conclusion, we described a case of recurrent papillary thyroid carcinoma manifesting as a metastatic lymph node, which was successfully ablated by RFA. The effectiveness and safety of RFA in treating primary thyroid tumors are feasible and safe. Therefore, RFA can be used as an alternative treatment in some cases, such as patients refused or not allowable for aggressive surgery.

Author Contributions

Yi-Chen Li and Shu-Ju Ku are first authors and responsible for the manuscript editing. Yung-Chuan Lu and Pi-Jung Hsiao reviewed all the data for publication. Hing-Chung Lam is responsible for literature review and consultation. Yu-His Kao is the corresponding author and in charge of the case.

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Not applicable.

Conflicts of Interest

The authors declare no conflict of interest.

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