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Case Report

Late Recurrence of Papillary Thyroid Carcinoma 31 Years After Total Thyroidectomy and Radioactive Iodine Therapy: A Case Report

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Abstract

Among Thyroid cancer Malignancies, Papillary Thyroid cancer considered to be the most common type of thyroid cancer diagnosed in histopathology reports. However, it has the best prognosis and treatment responding rate between all other thyroid malignancies, Late recurrences: defined as those occurring more than two decades post-treatment are rarely reported and may present diagnostic and management challenges in the majority of cases recurrence of Papillary thyroid carcinoma (PTC) occurs in the first 10 years after a successful treatment, but its Sporadic after the First decade of initial treatment. We report a unique case of a 75-year-old patient presenting with a local recurrence of PTC 31 years after undergoing total thyroidectomy and radioactive iodine (RAI) therapy.

Keywords: Papillary Thyroid Cancer; Thyroidectomy; Radioiodine Ablation; Recurrence; Lymph Node; Case Report; Neck

Introduction

Among all endocrine cancers, Thyroid cancer is the most common type of malignant endocrine cancer globally [1,2] .*The American Cancer Society (ACS) estimates that in 2025 around 44,020 new cases of thyroid cancer will be diagnosed* [3], Thyroid cancer, including all its types, is responsible for approximately 0.4% of all cancer-related deaths, and 5 years survival rate reach up to 98.4%, Papillary thyroid carcinoma is considered the most common type of thyroid cancer diagnosed histologically [4]. According to meta-analysis study encompassing 52 studies found that the rate of occult central lymph node metastasis increases with tumor size, starting from around 30.3% for Tumors less than or equal to ≤5 mm reaching up to 61.2% for tumors larger than 4 cm in size [5] on the other hand the prevalence for lateral lymph node metastasis is 20.9% [6]. Metastasis of the disease to the Lateral cervical nodes linked with multilevel nodal involvement and central nodal involvement [7]. Numerous studies have demonstrated a lymph node recurrence rate ranging from 5% to 20% following initial surgery [6-9], nevertheless PTC usually have good prognosis if treated early and followed up closely. Although the recurrence rate considered to be a rare after the first decade of definitive treatment, papillary thyroid cancer can recur and this case emphasizes the critical role and necessity of long-term surveillance and follow-up in patients who have undergone a definitive and successful treatment for papillary thyroid cancer.

Case Presentation

A 75- years old Persian male presented to Endocrine surgery clinic with a complain of right neck swelling for 2 months duration, gradually increasing in size, The patient denied any other symptoms such as fever, dyspnea, dysphagia, dysphonia, and weight loss. Patient known case of diabetes mellitus and hypertension. He re-

ported a history of Total thyroidectomy in 1992 secondary to PTC followed by Radioactive iodine ablation, as a follow up in 1993 a full Body scan done post radio ablation and no sign of disease detected. Physical examination showed 6 by 6 cm right mass in the lateral neck aspect. The mass was irregular in shape, freely mobile, non-fixed, and non-tender. No palpable mass identified in the thyroid fossa, or in the anterior neck component.

Due to the significant background of thyroid cancer, several labs were done during the assessment and results were as following: Parathyroid hormone = 6.9 pmol/L [SERUM 1.96~9.33 pmol/L], Thyroglobulin >300 ng/mL [0.2-300], Calcium 2.26 mmol/L [2.20~2.55], Thyroid stimulating hormone 12.81 mIU/L [0.55~4.78], Triodothyroxine (T3), FREE 4.3 pmol/L [2~5], Thyroxine (T4) FREE 12.6 pmol/L. laboratory investigations mentioned in Table 1 below.

Test	Result	Reference Range	Remarks
Parathyroid Hormone (PTH)	6.9 pmol/L	1.96 - 9.33 pmol/L	Within normal limits
Thyroglobulin	>300 ng/mL	0.2 - 300 ng/mL	Elevated
Calcium (Serum)	2.26 mmol/L	2.20 - 2.55 mmol/L	Within normal limits
Thyroid Stimulating Hormone	12.81 mIU/L	0.55 - 4.78 mIU/L	Elevated - Suggests hypothyroidism
Triiodothyronine (T3), Free	4.3 pmol/L	2.0 - 5.0 pmol/L	Within normal limits
Thyroxine (T4), Free	12.6 pmol/L	Typically ~9 - 20 pmol/L*	Within normal limits

Table 1: Preoperative laboratory investigations.

Computed Tomography (CT) scan with IV contrast which showed A large, heterogeneous soft tissue mass in the right lateral neck, around 6* 5 CM, it displaces the adjacent structures but does not invade major vessels, This mass consistent with enlarged lymph node. Which showed no evidence of recurrence in thyroid bed, nor neoplastic disease (Figure 1,2,3).

Figure 1: A coronal Computed Tomography (CT) showed lateral right neck mass highlighted with The yellow circle.

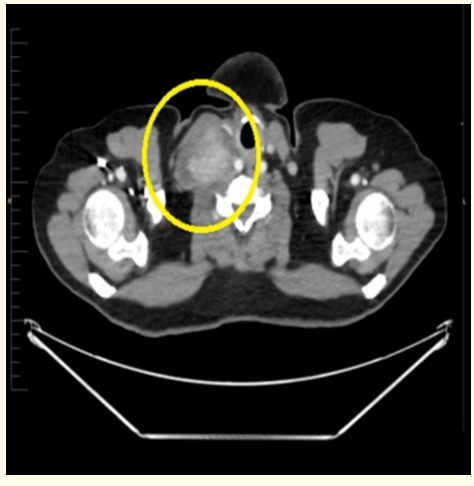

Figure 2: An Axial Computed Tomography (CT) showed lateral right neck mass marked with a yellow circle.

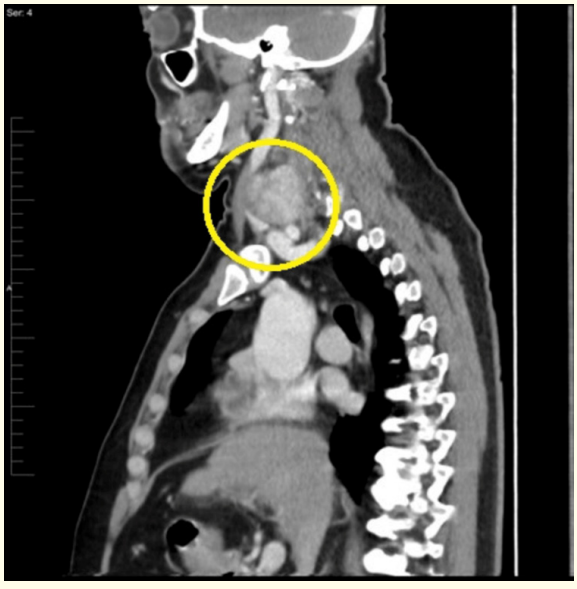

Figure 3: A sagittal Computed Tomography (CT) shows the enlargement demarcated in yellow.

Fine needle Aspiration done under the guidance of ultrasound showed A final Diagnosis of Malignant cell with features consisting with papillary thyroid carcinoma (PTC).

Patient was also scheduled for Tc-99m pertechnetate thyroid scintigraphy (thyroid scan), which is shown in the following figures (Figure 4,5,6).

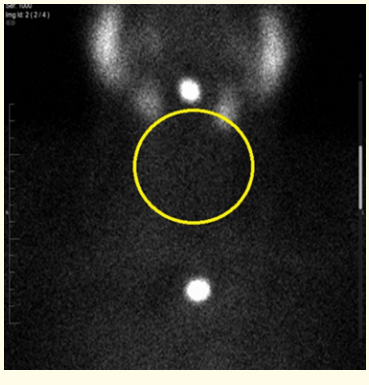

Figure 4: Tc-99m pertechnetate thyroid scintigraphy (thyroid scan) shows almost no activity across all views highlighted in yellow, constant with the previous history of total thyroidectomy.

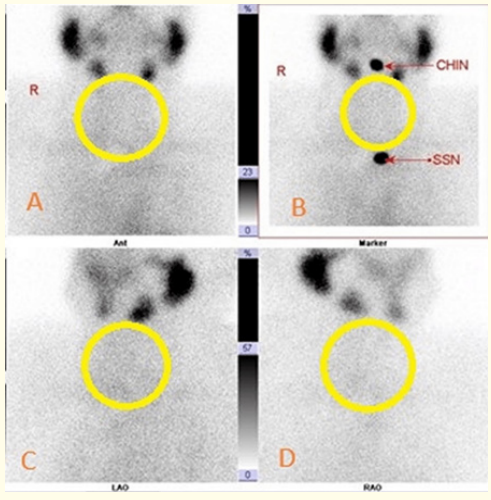

Figure 5: Tc-99m pertechnetate thyroid scintigraphy (thyroid scan) shows almost no activity across all views outlined in yellow in all images A, B, C, D, constant with the previous history of total thyroidectomy. ANT (Anterior), LAO (Left Anterior Oblique), RAO (Right Anterior Oblique), Marker view (with anatomical reference points labeled: CHIN and SSN – suprasternal notch).

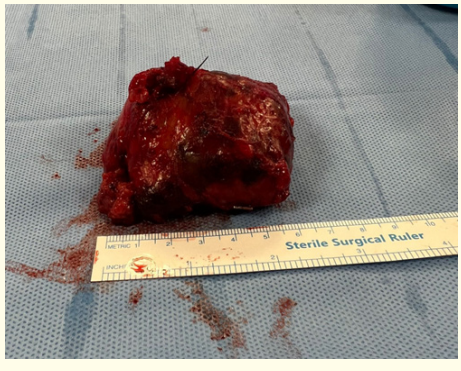

Figure 6: The largest neck lymph node excised from the patient.

Thyroid scan final report

- **Uptake Rate:** Total uptake is 0.1%, with no measurable uptake in either the right or left lobe (0.0% each).

- **Size and Morphology:** The vertical length is identical for both lobes at 4.8 cm, while the horizontal length is also symmetrical, measuring 3.3 cm in both the right and left lobes. The volume shows minimal asymmetry, with the right lobe measuring 29.1 cm^3 and the left lobe 27.7 cm^3 (right-to-left ratio ≈ 1.0), the weight is nearly equal between the two lobes, with the right lobe weighing 20.3 g and the left lobe 20.5 g, A summary of the result statistics presented in Table 2.

Parameter	Total	Right Lobe	Left Lobe	Right/left
Uptake Rate (%)	0.1	0.0	0.0	2.0
Vertical Length (cm)	4.8	4.8	4.8	1.0
Horizontal Length (cm)	3.4	3.3	3.3	1.0
Volume (cm^3)	56.8	29.1	27.7	1.0
Area (cm^2)	26.2	13.0	13.2	1.0
Weight (g)	40.8	20.3	20.5	1.0

Table 2: Tc-99m pertechnetate thyroid scintigraphy result statistics.

Interruption Summary

- The thyroid lobes show almost no activity across all views, constant with the previous history of total thyroidectomy.
- **Extremely low thyroid uptake:** Thyroid scan showed a Total uptake of 0.1%, with 0.0% seen in both lobes individually. This is well below the normal range (typically around 1–5% for technetium scans)
- No definitive focal hot or cold nodules are visible in the thyroid bed.

Given these diagnostic Findings, this patient was scheduled for a right lateral neck dissection, patient was consented and all risks and complications explained. He undergone an uncomplicated right lateral neck dissection including of levels 2a, 3, 4, and 5b lymph node groups under general anesthesia. The mass excised measuring (6*5*4 cm) as demonstrated in (Figure 6 and Figure 7). Final pathology report confirmed the diagnosis of Papillary thyroid carcinoma, classic type 1.

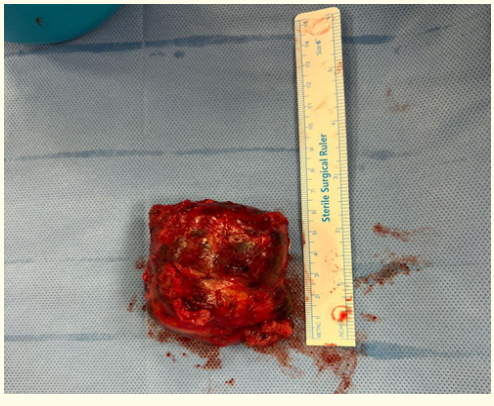

Figure 7: Neck mass excised from patient.

Discussion

The patient in our case had a history of Papillary thyroid cancer, which was diagnosed and treated at the age of 43, He underwent total thyroidectomy with post-operative radioactive iodine ablation therapy. but developed a recurrence of the disease on his lateral neck lymph nodes group, As noticed in several literatures, The recurrence rate of papillary thyroid cancer after the first decade post op considered to be quite low, Only few cases reported worldwide [10-13], especially after a definitive treatment constant of total thyroidectomy followed by radioiodine ablation and thyroid hormone suppressant therapy but it does not fully exclude the importance of Surveillance and follow up on long term.

The extent of postoperative surveillance in papillary thyroid cancer are traditionally based on risk stratification of the patients. Thyroid cancer patients are stratified into three risk categories low-risk with a recurrence risk of less than 5%, intermediate-risk with a recurrence risk between 5% and 20%, and high-risk with a recurrence risk greater than 20% [14].

Individuals exhibiting undetectable or very low thyroglobulin (Tg) levels, Tumor confined to the thyroid with no extra thyroidal

disease, no gross or microscopic extrathyroidal extension, No regional lymph node or distant metastases (clinical or radiologic), R0 or Completely resected tumor with negative margins, No vascular invasion and No aggressive histologic subtypes. For these patients, the recurrence rate is notably low approximately 1.2% at 5 years and 2.9% at 24 years post-thyroidectomy Consequently, long-term intensive surveillance may not be necessary, and some patients might be discharged from routine follow-up as early as five years after surgery [15].

Late recurrence is uncommon, but is a recognized phenomenon, and Multiple case reports and long-term studies have documented recurrences occurring after first decade of proper and successful treatment of papillary thyroid cancer [10-13].

This case not to change in guidelines but to reinforce the importance of maintaining a high index of suspicion for PTC recurrence in any patient presenting with a new neck mass, regardless of the length of time since primary treatment. This consideration is especially relevant for head and neck surgeons, Endocrine surgeons and endocrinologists involved in the long-term care of thyroid cancer survivors.

Conclusion

This case highlights the importance of long-term surveillance and follow up in patients treated for papillary thyroid cancer, even after receiving complete definitive therapy including total thyroidectomy with post operative radioactive iodine ablation, and thyroid hormone suppression. Although the recurrence rate after the first decade post-operatively considered to be rare, as supported by the literature but Recurrence in the lateral neck lymph nodes, as seen in this patient, demonstrates the need for regular follow-up to ensure timely detection and management of late recurrences.

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