Radioiodine Avid Axillary Lymph Node Metastasis in Papillary Thyroid Cancer: Report of a Case

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Introduction

Differentiated thyroid cancer (DTC) is the most common endocrine neoplasm. Distant metastases occur in up to 10% of patients with DTC [1, 2]. They are the main cause of thyroid cancer related deaths but are compatible with long term survival in a large proportion of patients. Regional lymph node metastasis is a very frequent finding in DTC. However, non regional lymph node metastasis especially to the axillary nodes has been rarely reported in literature and it is not considered to be a typical site for metastasis from DTC [3].

Case Report

We report the case of a 37 year old man who after surgery and radioiodine ablation (RIA) for papillary carcinoma thyroid (PCT), developed pulmonary and axillary lymph node metastasis. The patient initially presented with a palpable left solitary thyroid nodule of 2 months duration. He was clinically and biochemically euthyroid. Fine needle aspiration cytology (FNAC) from the nodule revealed PCT. Total thyroidectomy was performed. Histopathologic examination (HPE) revealed follicular variant of papillary carcinoma. Patient received 40 mCi ¹³¹I for remnant

ablation. Stimulated serum Thyroglobulin (Tg) level was 65 ng/ml. He was administered 200ug of thyroxine daily and his TSH level was maintained between 0.5 and 0.8 mIU/L. At 6 month follow up, stimulated Tg level following hormone withdrawal for 4 weeks rose to 75 ng/ml and ¹³¹I Whole body scan showed bilateral lung uptake. ¹⁸F-FDG PET/CT revealed presence of bilateral lung metastases. He was treated with two doses of 150 mCi radioiodine at intervals of 6 months with each post therapy scan showing bilateral lung uptake.

At the fourth visit for therapy, the patient complained of a left axillary swelling which on examination was a non-tender, firm lymph node and the post therapy whole body scan after 150 mCi radioiodine therapy revealed a focus of intense radioiodine uptake in the left axillary region (Fig. 1). The uptake was localized to an enlarged left axillary node on SPECT/CT (Figs. 2 and 3). FNAC from the node showed clusters of follicular cells and micro-papillary architecture, consistent with PCT (Fig. 4). Since resection of the axillary nodes was not indicated, the patient received a further dose of 150 mCi radioiodine after 6 months. At this time his stimulated serum Thyroglobulin decreased to 5 ng/ml and intensity of bilateral pulmonary uptake decreased significantly. The axillary node was not palpable anymore but visible on the post therapy radioiodine scan as just a faint focus of radioiodine uptake. The patient has now taken 640 mCi radioiodine over last 3 years. His pulmonary function tests are normal and he has been planned for further radioiodine therapy at yearly intervals.

Discussion

Papillary thyroid carcinoma rarely metastasizes to axillary lymph nodes. In a report by Nakayama et al.,

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Fig. 1 Planar image of ^{131}I post therapy whole body scan showing radioiodine uptake in both lungs and intense uptake in left axilla. Also noted is uptake in a mediastinal node

Fig. 2 **a.** Transaxial SPECT images showing focal area of increased ^{131}I uptake in the left axillary region. **b.** Transaxial CT images showing an enlarged lymph node in the left axilla with loss of normal

architecture. **c.** Transaxial fused SPECT/CT images showing intense ^{131}I uptake in the enlarged left axillary node

Fig. 3 Transaxial ^{18}F -FDG PET/CT image showing metastatic nodule in the right lung

Fig. 4 FNAC (Giemsa X 40 $\times$) from left axillary lymph node showing cluster of follicular cells in repetitive microfollicular pattern

the patient presented with cervical lymphadenopathy, and axillary nodal disease was also part of the initial presentation. Recurrence after 6 years also occurred at the same sites [4]. Koike et al. reported a case of axillary lymph node recurrence of thyroid papillary microcarcinoma in a woman who had undergone thyroidectomy with lymph node dissection 5 years earlier. They performed residual thyroid resection with cervical and bilateral axillary lymph node dissection, and pathological examination revealed well-differentiated papillary carcinoma, with partial poor differentiation. Postoperative radioiodine therapy was ineffective, and the patient died of systemic dissemination of the recurrence 8 months after her second operation. The positive cell rates of proliferating cell nuclear antigen and Ki-67 were clearly higher in the recurrent lymph nodes than in the primary thyroid tumor, suggesting increased cell proliferation in the recurrent lymph nodes which might explain the more aggressive behaviour [5].

Various histologic subtypes have been seen in axillary nodal metastasis including papillary thyroid carcinoma [4–9], sclerosing mucoepidermoid carcinoma with eosinophilia [10], mucin producing poorly differentiated adenocarcinoma [11] and primary mucoepidermoid carcinoma [12]. Few hypotheses have been proposed to explain the unusual spread. Ers et al. reported a case of PCT, who developed a lymph node metastasis in the left axillary region 6 years after initial surgical treatment. The authors hypothesized that hematogenous dissemination or retrograde dissemination through regional lymphatic channels may account for such unusual localization [6]. Kepenekci et al. hypothesized that retrograde dissemination through the regional lymphatic channels as a result of obstruction of lymphatic vessels is the basis for axillary metastasis in thyroid cancer [9]. Rouviere et al. reported that there is communication between the cervical and axillary lymphatics [13]. In our case, the patient did not have cervical or axillary lymphadenopathy at presentation. In fact even after lung and axillary node metastases were found, there was no evidence of lymphadenopathy in the neck even on FDG PET/CT. Also, lung metastases were seen almost an year before the axillary nodal involvement. Hence, in our case the two possibilities i.e. hematogenous dissemination to both sites i.e. lungs and axillary node, or lymphatic spread to the axilla from the lungs, are more likely.

A rare possibility of malignant degeneration of ectopic thyroid tissue must also be kept in mind as ectopic thyroid tissue has been reported in the axilla [14].

Axillary lymph node metastasis is known to be associated with systemic disease and a poor prognosis [9]. Therefore, aggressive management of such cases is man-

dated viz. curative surgery if possible and/or ¹³¹I therapy in cases which are radioiodine avid and have concomitant distant metastasis.

It is well known that radioiodine uptake in a node is synonymous with metastatic disease from DTC, notwithstanding other extremely rare differentials. To further confirm our findings we also did an FNAC from the node. To the best of our knowledge this is the first case reported in literature where intense radioiodine uptake was seen in the left axilla and subsequently confirmed by SPECT/CT to be localized to the clinically palpable axillary node. This finding made the nodal lesion amenable to radioiodine therapy and it decreased significantly in size on follow up examination at 6 months.

Conflict of interest statement The authors have no conflict of interest for this manuscript.

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