

## Case Report

### Papillary Thyroid Cancer with diffuse lung metastasis

Somayeh khosravi<sup>1</sup>, Shirin Hasani Ranjbar<sup>1</sup>, Sayeh Alizad Jahani<sup>2</sup>

<sup>1</sup>. M.D., Endocrinology and Metabolism Research Center, Tehran University of Medical Sciences, Tehran, Iran

<sup>2</sup>. Endocrinology and Metabolism Research Center, Tehran University of Medical Sciences, Tehran, Iran

[Sh\\_hasani@sina.tums.ac.ir](mailto:Sh_hasani@sina.tums.ac.ir)

**Abstract:** Thyroid carcinoma is a rare condition comprising 1% of all malignancies. Thyroid malignancies presenting with dyspnea and milliary metastasis are also rare. To manage and confirm lung metastasis in such cases beside evaluation of tuberculosis and other infections, considering iodine avidity and thyroglobulin levels are critical. In this situation, pulmonary fibrosis may be a severe side-effect and the indication for repeated courses of radioiodine therapy has to be decided thoroughly. Hyroglobulin level and the size of pulmonary nodules could be helpful for differentiating active lung metastasis from fibrosis. Here we report an Eighty years old man suffering from Papillary Thyroid Cancer with Follicular Variant and milliary lung metastasis at presentation.

#### Bibliographic Information of this article:

[Somayeh khosravi, Shirin Hasani Ranjbar, Sayeh Alizad Jahani. **Papillary Thyroid Cancer with diffuse lung metastasis**. Electronic Physician, 2012;4(2):555-559. Available at: <http://www.ephysician.ir/2012/555-559.pdf> ]. (ISSN: 2008-5842). <http://www.ephysician.ir>

**Keywords:** Papillary carcinoma; Follicular Variant; Thyroid nodule; Milliary lung metastasis

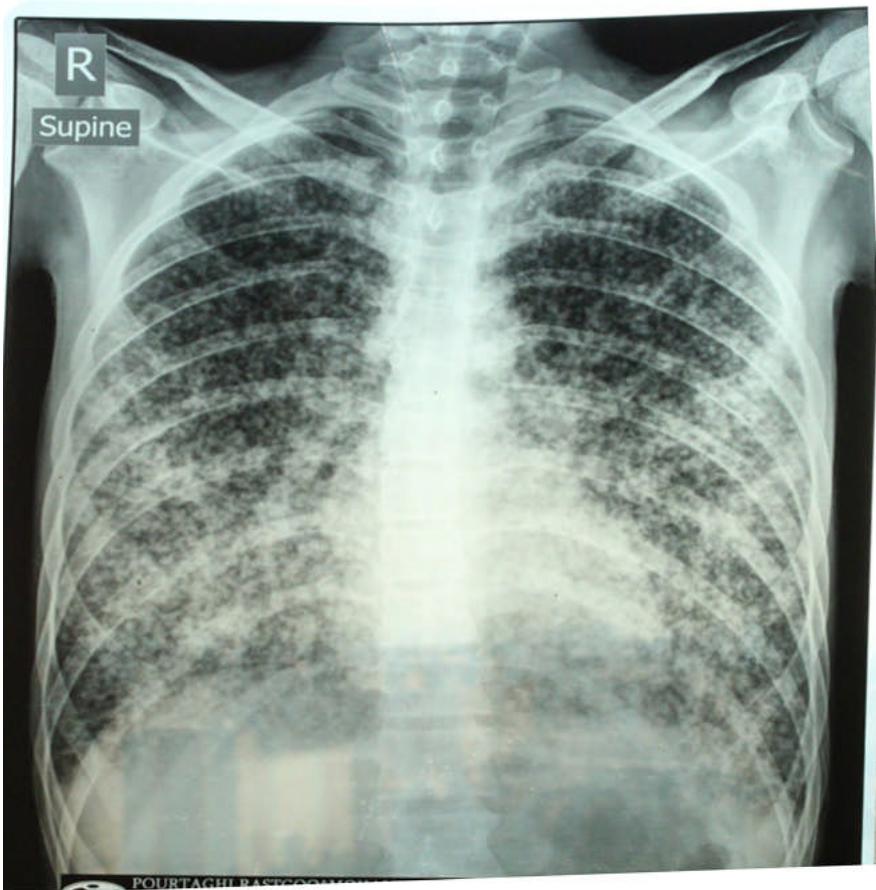
© 2009-2012 Electronic Physician

#### 1. Introduction

Papillary thyroid carcinoma (PTC) is the most frequent type of thyroid cancer. Recent studies showed that the incidence of PTC is growing ( between 2.7 to 7.7 per 100,000) (1, 2). Some factors may be responsible for the increased incidence of this tumor. The first is detection of small early lesions by ultrasonography and fine-needle aspiration (FNA). The second is the better recognition of the follicular variant of papillary carcinoma (FVPTC). Other factors include more common exposure to the ionizing radiation and a more iodine rich diet. Of the several histological variants of papillary carcinoma the follicular variant is to be probably most common (accounting for about 10 percent of all PTCs) (3). The overall prognosis for papillary thyroid carcinomas is very good with a 10-year survival rate of 93% (4). Distant metastases which need higher activities of radioiodine are less frequent with 10-20%. Ten percent of patients have metastases beyond the neck at the time of diagnosis. Between such patients 25 percent have skeletal metastases, and 75 percent have pulmonary metastases, but milliary pattern of lung metastasis is very rare in PTC. A specific finding in children is disseminated, milliary lung metastases with intense radioiodine uptake. The 10-year survival rate is 30 to 50 percent. Still higher survival rates have been noted in patients whose pulmonary metastases could be detected by radioiodine imaging (5). Even in advanced cases of childhood thyroid cancer, long-lasting remissions can be achieved. Follicular-variant papillary cancers (FVPTC) are likely to be smaller than common-type papillary cancers, and the risk of regional lymph node metastases may be uncommon (6, 7). One of the differential diagnoses of milliary nodules in lungs is thyroid carcinoma in which, increasing thyroglobulin (Tg) levels and positive radioactive iodine uptake are diagnostic (8). Since the 1940s Radioiodine (<sup>131</sup>I) therapy has been used for patients with papillary or follicular thyroid cancer (9). Radioiodine has both scanning and treatment aspects. Patients were treated with <sup>131</sup>I have a five-year survival rate of 60 percent, compared with 30 percent in those whose tumors do not concentrate <sup>131</sup>I (10). Here we report a patient suffering from Papillary Thyroid Cancer with Follicular Variant and milliary lung metastasis at presentation who was treated with radio iodine and discuss the challenging management of such cases.

## 2. Case Presentation

An 18 year old man presented initially with weight loss (10kg) in two month and a 3 month history of a mass on the right side of his neck, which had recently increased in size. The patient had no past history of neck radiation or a family history of thyroid cancer. The lymph nodes of the lateral compartment of neck were significantly enlarged. Physical examination revealed a palpable firm, fixed mass measuring 3.5×2.5 ×2cm in right lobe. The margins were irregular. The left lobe and the isthmus were soft without any abnormality and two lymph nodes measuring 0.5×0.5 were palpable bilaterally. Chest examination revealed diffuse crackle. Physical examination of other organs was unremarkable. Ultrasonography of thyroid was compatible with an irregular mass in right lobe of thyroid and multiple enlargements of cervical lymph nodes bilaterally.

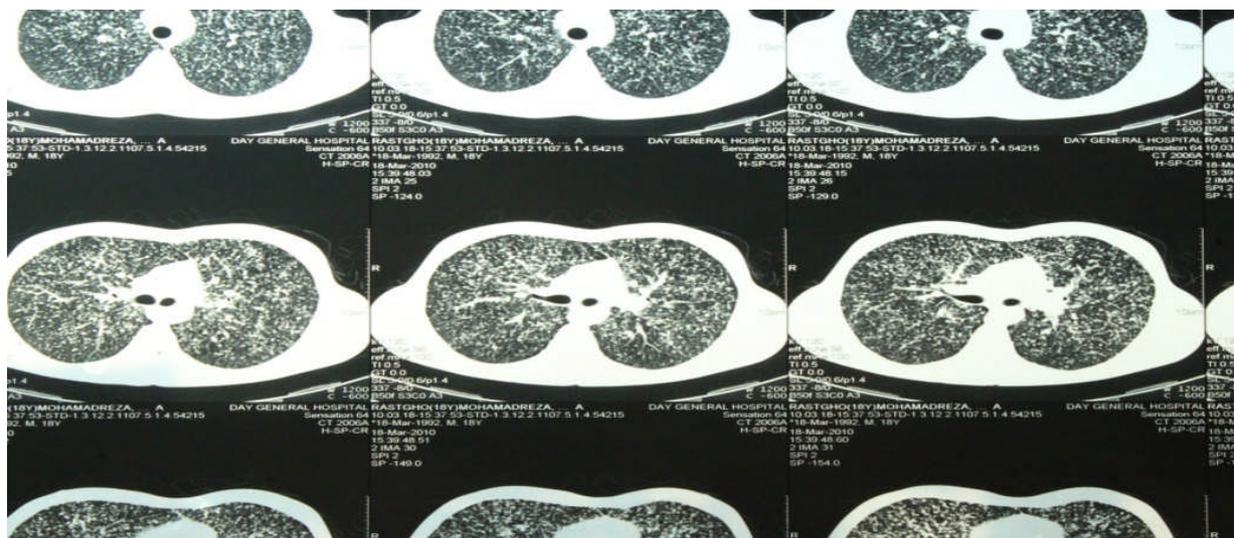


**Figure1.** Chest X Ray showed diffuse nodular opacities in both lung fields (snow storm view)

Fine Needle Aspiration Cytology (FNAC) of right thyroid nodule revealed papillary thyroid carcinoma with follicular variant. Hematologic data including Complete Blood Count (CBC), electrolytes, Blood Urea Nitrogen (BUN), creatinine, Erythrocyte Sedimentation Rate (ESR), Fasting Blood Sugar (FBS) were within normal limits. Thyroid function tests revealed the following values: Triiodothyronine (T3): 80µg/dl, Thyroxine (T4): 4.4µg/dl, Thyroid stimulating hormone (TSH): 6.4MIU/L, and Thyroglobulin (Tg) :1090 ng/ml. Total thyroidectomy with central node dissection was conducted and then the patient was treated with 150 mic Radioactive Iodine-131. Levothyroxine sodium (150 microgram daily) was prescribed. Ultrasonography in this stage reported that thyroid tissue and cervical lymph nodes were not seen. After 1 month, he presented to clinic with Tonic-clonic seizure and urine incontinency and laboratory data reported the serum calcium level at 5mg/l.

Brain CT scan for rule out of metastasis was done and reported normal; so according to history of neck dissection and biochemical tests, secondary hypoparathyroidism due to thyroidectomy was diagnosed. Patient underwent treatment with white pearl Rocatrol (6/daily) and Calcium Carbonate (3000 mg/daily). He was discharged with

normal serum calcium concentration. After two months, productive cough, dyspnea, orthopnea, and paroxysmal nocturnal dyspnea gradually added to first manifestations and then progressive cyanosis of the lips and fingers was appeared. Chest x ray showed infiltrated nodular snow storm viewed (figure 1). In HRCT scan with contrast there was innumerable small parenchymal nodular lesions (Figure 2). However, considering diffuse milliary pattern at both lungs witch mostly suggested milliary tuberculosis; broncoscopy with alveolar lavage was done that was negative for tuberculosis and also no fungal or other micro-organisms were detected.



**Figure 2.** Spiral HRCT with contrast: innumerable small parenchymal nodular

Echocardiography was unremarkable but mild pericardial effusion was detected and pulmonary artery pressure (PAP) was 20mmHg. In this regard, pulmonary function tests (PFT) was done that reported: FEU: 41%, FEV1/FVC: 83%. Pulmonary embolus was ruled out by pulmonary ventilation/perfusion scan. Retrospectively post radio iodine ablation scan revealed, increasing uptake in both lungs and confirmed iodine avid thyroid tumor metastasis.

Based on consultation with respiratory service radioiodine (I-131) therapy with dosimetry was recommended for him. According to the documentation provided Respiratory distress in the field of Pulmonary metastasis was enhanced against other differential diagnosis such as (pulmonary fibrosis), in this regard radioiodine (I-131) therapy with 170 mic was done. After 3 days increasing uptake in lungs was reported in post ablation scan. On the other hand Tg level was more than 1000ng/ml. The patient was treated with Levothyroxine sodium (1/5 daily) and after six months, respiratory symptoms declined and the patient was ready to receive the next dose of radioiodine therapy.

### 3. Discussions

According to latest edition of American Thyroid Association (ATA), PTC has 15 variants. The follicular variant of papillary carcinoma (FVPTC) is the most frequent type of PTC witch firstly described by Hazard and Crile in 1953 who named this lesion alveolar variant of PTC (11). From time to time, patients present with metastasis in a neck lymph node or with hoarseness of voice caused by involvement of the recurrent laryngeal nerve. Infrequently, FVPTC gives rise to lung metastases in the nonexistence of lymph node involvement (12). Conversely, follicular thyroid cancer showed more distant metastases than papillary thyroid cancer (13, 14).

Follicular carcinoma and follicular adenoma are main differential diagnoses of this tumor. FVPTC may show partially or completely encapsulated (15, 16) in relation to pure papillary thyroid carcinoma, difficulties in pre-operative diagnosis and high ratios of first clinical presentation with distant metastases were the main problems to be conquer (17).

In same case report that Owned to a 10 year-old-boy with pulmonary metastases under taken thyroidectomy and has received two doses of ablative therapy and improved. Thyroglobin levels and his general

condition were good after ablative therapy (18). There are case reports of this entity in literature presenting as lung metastasis.

According to American Thyroid Association Guidelines these macronodular pulmonary metastases may be treated with RAI if demonstrated to be iodine avid (19). Complete remission is not common and survival remains poor. To manage and confirm lung metastasis in such cases beside evaluation of tuberculosis and other infections, considering iodine avidity and thyroglobulin levels are critical. In this situation, pulmonary fibrosis may be a severe side-effect and the indication for repeated courses of radioiodine therapy has to be decided thoroughly (20). In follow up thyroglobulin level and the size of pulmonary nodules could be helpful for differentiating active lung metastasis from fibrosis to decide for repeated Radi iodine ablation.

#### **Acknowledgements:**

The authors thank the Endocrinology & Metabolism research Institute of Tehran University of Medical Sciences, for their support and contribution to this study.

#### **Corresponding Author:**

Dr. Shirin Hasani Ranjbar  
Endocrinology and Metabolism Research Center  
Shariati Hospital, Tehran, Iran  
Tel: +98.2188220037  
Fax: +98.2188220052  
E-mail: [Sh\\_hasani@sina.tums.ac.ir](mailto:Sh_hasani@sina.tums.ac.ir) and [shirinhasanir@yahoo.com](mailto:shirinhasanir@yahoo.com)

#### **References**

1. Davies L, Welch HG. Increasing incidence of thyroid cancer in the United States, 1973-2002. *JAMA*. 2006 May 10;295(18):2164-7. PMID: 16684987
2. Enewold L, Zhu K, Ron E, Marrogi AJ, Stojadinovic A, Peoples GE, Devesa SS. Rising thyroid cancer incidence in the United States by demographic and tumor characteristics, 1980-2005. *Cancer Epidemiol Biomarkers Prev*. 2009;18(3):784
3. Tielens ET, Sherman SI, Hruban RH, Ladenson PW. Follicular variant of papillary thyroid carcinoma. A clinicopathologic study. *Cancer*. 1994 Jan 15;73(2):424-31. Pubmed PMID: 8293410.
4. Mazzaferri EL, Kloos RT. Current approaches to primary therapy for papillary and follicular thyroid cancer. *J Clin Endocrinol Metab*. 1993;73:33-8.
5. Casara D, Rubello D, Saladini G, Masarotto G, Favero A, Girelli ME, Busnardo B. Different features of pulmonary metastases in differentiated thyroid cancer: natural history and multivariate statistical analysis of prognostic variables. *J Nucl Med*. 1993 Oct;34(10):1626-31. Pubmed PMID: 8410272.
6. Chang HY, Lin JD, Chou SC, Chao TC, Hsueh C. Clinical presentations and outcomes of surgical treatment of follicular variant of the papillary thyroid carcinomas. *Jpn J Clin Oncol*. 2006 Nov;36(11):688-93. Pubmed PMID: 17000702.
7. Zidan J, Karen D, Stein M, Rosenblatt E, Basher W, Kuten A. Pure versus follicular variant of papillary thyroid carcinoma: clinical features, prognostic factors, treatment, and survival. *Cancer*. 2003 Mar 1;97(5):1181-5. Pubmed PMID: 12599223.
8. Ilgan S, Karacalioglu AO, Pabuscu Y, Atac GK, Arslan N, Ozturk E, Gunalp B, Ozguven MA. Iodine-131 treatment and high-resolution CT: results in patients with lung metastases from differentiated thyroid carcinoma. *Eur J Nucl Med Mol Imaging*. 2004 Jun;31(6):825-30. Pubmed PMID: 14762699
9. Spitzweg C, Harrington KJ, Pinke LA, et al. Clinical review 132: The sodium iodide symporter and its potential role in cancer therapy. *J Clin Endocrinol Metab*. 2001; 86:3327.
10. Maxon HR, Smith HS. Radioiodine-131 in the diagnosis and treatment of metastatic well-differentiated thyroid cancer. *Endocrinol Metab Clin North Am*. 1990; 19:685
11. Crile G, Hazard JB. Relationship of the age of the patient to the natural history and prognosis of carcinoma of the thyroid. *Ann Surg*. 1953;138:33-8.
12. Baloch ZW, LiVolsi VA. Follicular-patterned lesions of the thyroid: the bane of the pathologist. *Am J Clin Pathol*. 2002;117:143-50.
13. Simpson WJ, Panzarella T, Carruthers JS, et al. Multivariate analysis of survival in differentiated thyroid cancer: the prognostic significance of the age factor. *Eur J Cancer Clin Oncol*. 1988;24:331-7

14. Samaan NA, Schultz PN, Hickey RC, Goepfert H, Haynie TP, Johnston DA, et al. The results of various modalities of treatment of well differentiated thyroid carcinoma: a retrospective review of 1599 patients. *J Clin Endocrinol Metab* 1992;75:714-20.
15. Castro P, Fonseca E, Magalhães J, et al. Follicular, papillary, and hybrid carcinomas of the thyroid. *Endocr Pathol* 2002;13:313-20.
16. Rosai J, Zampi G, Carcangiu ML. Papillary carcinoma of the thyroid: a discussion of its several morphologic expressions, with particular emphasis on the follicular variant. *Am J Surg Pathol* 1983;7:809-17.
17. Goodell WM, Saboorian MH, Ashfaq R. Fine-needle aspiration diagnosis of the follicular variant of papillary carcinoma. *Cancer* 1998;84:349-54.
18. Josephina C.J. Vermeer-Mens, Natascha N.T. Goemaere, Vibeke Kuenen-Boumeester, Sabine M.P.F. de Muinck Keizer-Schrama, Christian M. Zwaan, Annick S. Devos, and Ronald R. de Krijger 2006
19. Cooper CS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, Mazzaferri EL, McIver B, Pacini F, Schlumberger M, Sherman SI, Steward DL, Tuttle RM. Revised American Thyroid Association management guidelines for patients with thyroid nodule and differentiated thyroid cancer. *Thyroid*, 2009;19(11):1167-214
20. Reiners C, Demidchik YE, Drozd VM, Biko J. Thyroid cancer in infants and adolescents after Chernobyl. *Minerva Endocrinol.* 2008 Dec;33(4):381-95.