

# Thyroid tumor of unknown malignant potential | case study



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Summary: A 40 year old woman presented with a history of progressively increasing multinodular goiter since 2006. Despite of benign fine needle aspiration result but in view of the rapidly increasing size of her thyroid nodules it was decided on clinical grounds to perform total thyroidectomy. Histopathology was consistent with WDT-UP. For the reason that there are no clear cut guidelines for the treatment of this entity, it was decided to treat her with radioactive iodine. Post radioactive iodine whole body scan showed evidence of pulmonary metastasis which were absent on C. T scanning performed thereafter suggestive of iodine avid pulmonary micro metastasis.

Conclusion: To our knowledge, this is the first published case report of a patient with WDT-UP having pulmonary metastasis.

## **Introduction:**

Well differentiated thyroid tumor of unknown malignant potential (WDT-UP) is an entity originally defined by Williams et al (1) and then subsequently classified in the last edition of World Health Organization (WHO) publication on classification of tumors (2). This novel term was the result of a review of the main pathological findings of cases of thyroid tumors from children and adults exposed to ionizing radiation caused by Chernobyl accident (3).

Despite of being classified as a separate diagnostic category by WHO, this is not fully adopted and accepted by all pathologists globally so far (4).

Moreover, since the proposal of this nomenclature in 2000, there had been no studies highlighting the prognosis and long term outcome of these patients. On the other hand, it has been speculated to have the same outcome as follicular adenoma with an excellent prognosis (1). There are few

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reviews and studies on pathological characteristics (4), genetic expression (5) and immune profiling of these tumors (6) but there are no published studies or case reports presenting the clinical outcome of these patients.

We report a case of a 40 year old woman with diagnosis of WDT-UP but found to have pulmonary uptake on post Radioactive iodine (RAI I 131) whole body scan (WBS). To the best of our knowledge; this is the first published case report of WDT-UMP with metastasis.

### **Case Presentation:**

A 40 year old previously healthy woman was referred to our endocrine clinic with history of multinodular goiter since 2006. There was no history of thyroid carcinoma in her family or any previous history of radiation exposure. On physical examination, she was found to have large thyroid nodule on the left side with three small sized nodules on the right side of the thyroid gland. There were no associated symptoms indicative of hypo or hyperthyroidism. Thyroid function tests performed by electrochemiluminescence immunoassay confirmed euthyroidism with thyroid stimulating hormone (TSH) of 0.7 u IU/ml (0.27-4.2) and free thyroxin (FT4) of 1.22 ng/dl (0.93-1.7). Thyroglobulin and anti microsomal antibodies were negative by microparticle enzyme immunoassay (MEIA). Ultrasonography of thyroid revealed at least two large heterogeneous solid looking nodules in left lobe of thyroid gland, the largest one measuring 4 x 1.3 x 1.2 cm. In addition, there were three nodules on the right lobe of thyroid gland. The largest nodule on right side was 1.4 x 1.3 x 1.2 cm. Technetium (TC99m) thyroid scan showed cold nodule in the left lobe of thyroid gland. Chest X-Ray also revealed large soft tissue mass in lower neck displacing trachea towards

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right side with no evidence of retrosternal extension. Fine needle aspiration biopsy (FNAC) from both left and right thyroid nodules was performed which was consistent with benign pathology. On the basis of the findings of FNAC, it was decided to observe her with ultrasound scans. Thyroid ultrasonography repeated after one year revealed complete replacement of left lobe of thyroid gland with a large solid cum cystic nodule measuring 6.1 x 4.4 x 2.8 cm (Figure 1) which subsequently increased after another year to 7.4 x 4.4 x 2.8 cm. Although no change was found in the size of the thyroid nodule on the right side. Repeated FNAC subsequently from both left and right nodules didn't show any evidence of malignancy. In view of the fact that the size of her thyroid nodule was progressively increasing and it was displacing the trachea so it was decided on clinical grounds to perform total thyroidectomy. Histopathological examination of the surgically removed specimen showed that right lobe measured 4.5 x 3.5 x 2.5 cm with intact capsule. Serial sectioning revealed variable sized, well circumscribed and ill-defined nodules ranging from 0.5 to 1.5 cm in diameter. Cut surface was soft and brown with areas of cystic degeneration. The left lobe specimen consisted of single dark brown, well circumscribed and capsulated solid nodule measuring 5.5 x 5.4 cm and weighing 79 gram. Serial sectioning showed areas of hemorrhage and cystic degeneration. Microscopic examination revealed thyroid parenchyma with a well circumscribed nodule composed of closely packed follicles (Figure 2) containing scant colloid. Few areas showed variable sized follicles with abundant colloid (Figure 3). The follicles were lined by follicular cells. Few areas had enlarged nuclei showing nuclear clearing and mild overlapping. Scattered nuclei had nuclear grooves (Figure 4). Nuclear inclusions were not seen. No capsular or vascular invasion

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was noted. Cytokeratin 19 (CK 19) was negative. Other areas revealed features suggestive of multinodular goiter. Based on findings, it was diagnosed as well differentiated tumor of uncertain malignant potential.

One month after her thyroidectomy, TSH stimulated thyroglobulin was 13.90ng/ml by chemiluminescence with TSH of 65.44Uiu/ml (0.27-4.2) and negative thyroglobulin antibodies. After several discussions involving multidisciplinary teams including endocrinologists, nuclear physician and pathologists it was decided to treat her with RAI in view of the fact that by eliminating thyroid remnants it would be easy to follow thyroglobulin as a tumor marker for detection of recurrence or metastasis. She was administered activity of 100 millicuries (mci) of radioactive iodine (RAI). Unpredictably her post ablation <sup>131</sup>IWBS showed uptake in thyroid bed with pulmonary metastasis (Figure 5).

Subsequently, her computed tomography scan (C. T) of chest with contrast did not reveal lesions in lung suggestive of iodine avid pulmonary micrometastasis.

At six months of follow-up patient was found to be completely tumor free with TSH stimulated thyroglobulin of 0.30ng/ml and negative neck ultrasonography and low dose (2mci) <sup>131</sup>I diagnostic WBS. Patient has been started on suppressive dose of thyroxine and is planned for strict follow-up according to guidelines for papillary or follicular thyroid carcinoma.

## **Discussion and Literature Review:**

The conventional grouping of thyroid carcinoma into the main categories of papillary, follicular, medullary and anaplastic (undifferentiated)  
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carcinoma based on morphological features according to WHO classification (2) has made the diagnosis of these entities very simple and straightforward. However, the argument arise in cases of encapsulated follicular variant of papillary thyroid carcinoma (FVPTC) also called as Lindsay's tumor (7). This was described originally by Lindsay in 1960 and then later reemphasized by Chen and Rosai (8; 9). These tumors are defined as an encapsulated neoplasm of follicular cells with follicular architecture and having archetypal nuclear characteristics of papillary thyroid carcinoma (PTC). The presence of capsular and /or blood vessel invasion is not a prerequisite for making the diagnosis. On the other hand, nuclear features of papillary thyroid carcinoma in the form of clearing, overlapping, grooves and pseudo inclusions should be widespread. Treatment of the lesions is not different from management of conventional papillary and follicular thyroid carcinoma since Chang et al pointed out the blood born metastatic pattern of some cases of FVPTC (10). To circumvent the low threshold of the endocrine pathologist in the diagnosis of these conditions two categories were proposed in 2000 regarding the terminology of thyroid tumors by the Chernobyl pathologists group. These novel definitions were based on the fact that there are several diagnostic uncertainties in terms of recognition of certain varieties of encapsulated thyroid tumors with a follicular architecture (11). Furthermore, there is propensity to over diagnose the entity of follicular variant of papillary thyroid carcinoma. To overcome this diagnostic dilemma, an editorial was published proposing the category of well differentiated tumor of uncertain malignant potential (WDTUMP) to include encapsulated tumors having minimal or questionable nuclear changes of archetypal papillary thyroid carcinoma but definite absence of vascular invasion. This is basically an intermediate

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category between benign and malignant lesion. Few studies have assessed the utility of the immune histochemical markers to delineate these lesions in terms of benign versus malignant category. Markers like Galectin-3 and HBME-1 have been examined in these tumors. HBME-1 has been shown to be a better marker of malignancy but due to the small sample size it is not recommended to base our diagnosis on these immunochemical markers (6). The authors also commented that the term as suggested by its name would not be expected to be followed by aggressive management (1). This borderline diagnosis was also made in order to avoid unnecessary surgery or radioactive iodine (RAI) treatment putting patients at risk of complications. However, the argument given against this entity was the fact that certainly this term would also be overused by the pathologists and will create uncertainty among endocrinologists and surgeons in terms of their management. Moreover, the defining authors mentioned their curiosity in knowing about the cases of metastasis in tumors satisfying the criteria of well differentiated tumor of uncertain malignant potential (WDT-UMP).

Due to the vagueness of the clinical behavior of these tumors, clinicians and surgeons are often puzzled regarding the treatment of these tumors. Moreover, there are no guidelines or protocols for the management of these tumors as well.

In the management of our case, we also encountered the similar problem and treatment uncertainty but ultimately decided to treat the patient with RAI post thyroidectomy which later on proved to be a sensible clinical decision due to the finding of pulmonary metastasis found on post RAI whole body scan. On the basis of the reported findings, it is tempting to speculate <https://assignbuster.com/thyroid-tumor-of-unknown-malignant-potential-case-study/>

that these new entities should be treated with total thyroidectomy followed by RAI until more long term data is available documenting the clinical outcome of these lesions.