

Case Report

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# Unusual Presentation of Insular Thyroid Carcinoma as a Chest Wall Mass

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## Introduction

Poorly Differentiated (Insular) Thyroid Carcinoma (PDITC) is an uncommon thyroglobulin producing neoplasm, intermediate in aggressiveness, morphologically and biologically placed between Well-Differentiated Carcinomas (WDC) of follicular cell origin and undifferentiated anaplastic carcinoma [1-20] and first described by Sakamoto et al. [12] and Carcangiu et al. [21]. The tumor occurs in an older group than the WDCs (also it can occur in adolescents [21]). It is described with higher mortality than WDC [11,22]. The present cancer staging system (TNM) for thyroid cancer considers differentiated and undifferentiated tumors while ignoring this intermediate type, which is also called poorly differentiated tumor [10].

PDITC, now recognized as a distinct thyroid neoplasm, accounts for 4-7% of thyroid malignancies, is twice as common in males with a mean age of 55.7 years [2,13-15]. It presents as a rapidly growing, large mass, cold on radioiodine scintigraphy with associated nodal and distant metastasis in 30% [2,14]. Higher aggressiveness has been suggested as an important clinical feature. The value of preoperative fine-needle aspiration biopsy is not clearly proven for it [23].

In this case we present an unusual presentation of insular thyroid carcinoma as a chest wall mass without any thyroid or neck complains.

## Case Report

A sixty-four year old and non-smoker man was admitted to Alzahra Hospital of Isfahan University of medical sciences on September 14<sup>th</sup>, 2012. He complained of chest wall mass since four months ago. There was no sign of discharge, erythema and warmth on the site and he didn't explain any symptoms of pain, fever and weight loss. He had no past medical and family history of malignant disorders. In the chest wall a large mass, measured 6×5 cm in manubrium of sternum was identified. There were no other significant findings on the physical examination. The laboratory data was also normal.

The history revealed this man had an ultrasound showing heterogeneous mass measured 110×54×88 mm contained multiple septa, echogenic and echo-free regions suspicious for internal necrosis which was expanded from middle upper chest area to the proximity of jugular and carotid vessels. He also had a core needle biopsy of mass that was reported "Paraganglioma" and so oncologist decided to plan for him 15 session radiation therapy. From his specimen a consulted Immunohistochemistry (IHC) on previously prepared paraffin embedded tissue blocks has been done and according to positive reaction for CK, CK7 and TTF1 and negative staining for chromogranin metastatic carcinoma has been reported. According to chest CT scan (Figure 1) open operation was performed. The skin was entered through an upper incision on sternum in site of mass that was extended in anterior on sternocluidomastoid muscle at the right side. After the dissection of subcutaneous tissue and fascia there was a solid adhesive mass on sternum and clavicle (Figure 2). This mass was removed with upper segment of sternum, sternoclavicular joints and head of clavicle. And then a total thyroidectomy and bilateral central lymph node dissection were done too. Through the mass removal, we had a significant bleeding. The samples were sent to the pathology. We

again repaired the empty area of chest wall and sternum with prolene mesh and then a Hemovac drain was inserted into the wound and fixed to the skin (Figure 3). The Pathologist reported the sample of chest wall and sternum was a metastatic carcinoma of thyroid cancer and the specimen of thyroid was an insular carcinoma (Figure 4). The patient's postoperative course was both two days admission in Intensive Care Unit (ICU) and in the surgery ward. Finally the patient was discharged with a good condition and it was followed again one week later with a better condition.

## Discussion

Thyroid tumors include a well-characterized histologic type known as insular carcinoma was proposed by Carcangiu et al. in 1984 [21]. The results of various authors are very controversial concerning prognostic significance. Diagnosis of insular carcinoma should be based on typical histologic characteristics; they are usually large, solid tumors



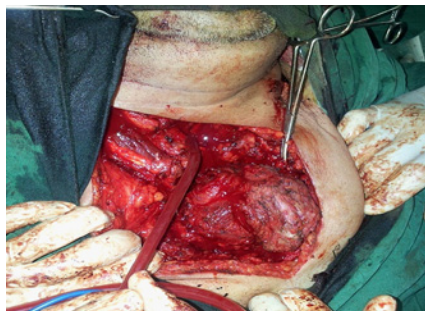
**Figure 1:** Spiral Chest CT scan with Contrast. Right thyroid lobe shows enlargement, retrosternal extension and heterogeneous enhancement. Manubrium of sternum shows expansion and sclerosis.

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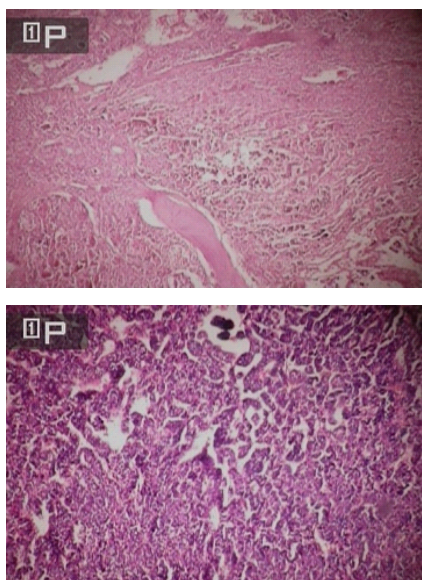
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**Figure 2:** After the dissection of subcutaneous tissue and fascia there was a solid adhesive mass on sternum and clavicle.



**Figure 3:** Hemovac drain was inserted into the wound and fixed to the skin.



**Figure 4:** Microscopically, nesting (insular) pattern of growth solid to microfollicular arrangement, small uniform tumor cells, variable mitotic activity and fresh tumor necrosis are seen. Chest wall extension and sterna bone invasion also are encountered. Immunohistochemically tumor cells are reactive for Thyroglobulin and TTF-1. There are negative for Calcitonin.

with frequent extrathyroid spread and foci of necrosis. In the series by Longwen, 54% of cases had extrathyroid involvement [16] such as our case. Microscopically the distinguishing features are a nesting ('insular') pattern of growth, solid to microfollicular arrangement, small

uniform tumor cells, variable mitotic activity, and fresh tumor necrosis resulting in a peritheliomatous pattern. Immunohistochemically, there is reactivity for thyroglobulin and TTF1 but not for calcitonin [24].

Although diagnosis still requires histologic study of the section, there are more and more attempts to find cytologic features characteristic of insular carcinoma. These include: high cellularity, necrotic remains, cellular nidi sometimes associated with microfollicles or a solid or trabecular model, cells of poorly defined cytoplasm and with vacuoles, nuclear atypia, frequent mitosis, and presence of thyroglobulin and Although cytologic studies were performed in our case, diagnosis was made after the histologic study. The differential diagnosis should be considered with medullary carcinoma and other neuroendocrine tumors because of the similarity of their carcinoid forms, with the solid subtype of papillary carcinoma, and with anaplastic carcinoma, especially when its pattern of growth is solid.

Paraganglioma's diagnosis has been done on pervious (before surgery) chest wall mass core needle biopsy without any ancillary technique. We had a broad panel of immunohistochemistry of this specimen as a following negative Chromogranin. Negative immunostaging for Chromogranin and positive reaction for CK subtype and TTF1 rolling out the diagnosis of Paraganglioma [16]. CK positive reaction and vimentin negative reaction are infavour of epithelial neoplasm "carcinoma". For further classification of carcinoma, CK7, CK2 and TTF1 staining has been done. According to positive reaction for CK7 and TTF1 and negative staining for CK20 only two origins included Lung and Thyroid are considered. Reactivity for thyroglobulin and imaging findings is confirmed thyroid origin. Medullary thyroid carcinoma can be excluded by negative calcitonin, chromogranin, CEA and TG [25-33]. Papillary thyroid carcinoma can be excluded by negative result for S100, vimentin and CEA [34-37]. TG positive rolling out the diagnosis of metastasis.

In contrast to undifferentiated carcinoma, poorly differentiated tumors usually concentrate radioiodine, a feature that can be used for diagnostic and therapeutic purposes [38,39]. The behavior is generally aggressive, with a high incidence of both nodal and blood-borne metastases [40,41].

It is probable that most of this tumors represent poorly differentiate forms of follicular carcinoma. The most controversial point with insular carcinoma concerns prognosis, because of the small number of cases published and the lack of large series. It is still not clear if the behavior of insular carcinoma depends more on the architectural pattern than the clinicopathologic features, as seen in well differentiated carcinomas (risk factors: age, tumor size, extrathyroid spread, and others). Age seems to have prognostic significance, as reported by Longwen [16], although there have been reports published of young patients dying from the disease. As far as size is concerned, although larger tumors show worse prognosis, smaller ones can also. Extrathyroid invasion and, especially, the presence of metastasis seem to be related to poorer prognosis, although there are no statistical studies to support this claim [16].

## Conclusion

According to this case report we conclude insular thyroid carcinoma could present without any signs and symptoms of thyroid complains and we should consider chest wall masses that can be aroused from thyroid origin. The procedure of surgery such as reconstruction with a mesh could be discussed in the future studies.



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