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## Case Report

# **Cutaneous manifestation of thyroid carcinoma in a 64-year-old Filipino woman: a case report**

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## **Abstract**

**Background:** Cutaneous metastasis is a rare phenomenon of thyroid carcinoma. Several mechanisms regarding cutaneous metastasis from internal malignancies have been proposed. Various treatment options are available, including surgical procedures, radioiodine therapy, thyroid hormone therapy, and other possible therapies. The prognosis of thyroid carcinoma with cutaneous manifestation is poor.

**Case Illustration:** We presented a case of 64-year-old female patient with previously diagnosed thyroid carcinoma admitted with enlarged and tender nodules on the right side of the anterior neck. No surgical intervention was done and patient was treated with chemotherapy using doxorubicin 80 mg as the agent of choice. Levothyroxine 100 mcg was also administered every 24 hours. Chemotherapy was given, however the patient eventually died due to respiratory failure.

**Discussion:** The patient initially presented with a slow-growing neck mass, which rapidly developed into larger mass with multiple erythematous to violaceous papules, firm tender nodules, and patches on the thoracic area, indicating slow and rapid progression of the disease. According to histopathologic examination, the patient had papillary thyroid carcinoma. However, the patient poorly responded to the chemotherapy regimen with doxorubicin, which indicated that this malignancy is associated with poor prognosis.

**Conclusion:** Cutaneous metastasis is a rare complication of thyroid carcinoma. Typically, it initially develops as a slow-growing tumor that subsequently progresses into multiple malignant lesions. It is an indicator of poor prognosis in thyroid carcinoma, and further studies are warranted to improve the prognosis of this disease.

**Keywords:** *cutaneous manifestation, thyroid carcinoma, metastasis*

## Background

Thyroid carcinoma is the most common type of endocrine malignancy. It typically presents as thyroid nodule. In rare cases, however, the patient may manifest unusual features. The presence of metastatic disease at the time of diagnosis indicates a bleak prognosis, and patients who present with symptomatic metastases usually respond very poorly to therapy.<sup>1</sup>

Carcinomas derived from follicular epithelial cells include papillary and follicular carcinoma, poorly differentiated carcinoma (also known as “insular” carcinoma), and anaplastic carcinoma. Papillary carcinoma is the most common follicular epithelial cell carcinoma in North America. The major sites of metastatic PTC are the lung, bone, and central nervous system.<sup>2</sup> Occasionally, hematogenous spread of papillary and follicular carcinomas may involve the lungs, liver, bone, and brain.<sup>3-5</sup> Medullary thyroid carcinomas are neuroendocrine neoplasms originating from the parafollicular cells and/or C cells. These lesions may also metastasize to locoregional lymph nodes and spread in hematogenous manner to the liver and lungs.<sup>4,5</sup> Anaplastic thyroid carcinoma is a rare and aggressive tumor that can metastasize to the skin in the context of diffuse body metastasizing. In contrast, cutaneous metastasis from different thyroid carcinoma is a rare manifestation of disseminated disease.

Some authors believe that follicular carcinoma of the thyroid is associated with the highest propensity for cutaneous metastasis, followed by papillary carcinoma, anaplastic carcinoma, and medullary carcinoma. In contrast, few authors believe that papillary carcinoma is the most common type of thyroid carcinoma with skin metastasis. The scalp has been the most common site of cutaneous metastasis in thyroid carcinoma.<sup>6,7</sup> The metastatic deposits usually present as flesh-colored nodules which are tender, itchy, and ulcerative. Skin metastasis seldom becomes a presenting feature of an underlying malignancy. Studies reported that the average length of survival following cutaneous metastasis is nineteen months since it usually occurs in disseminated neoplastic disease.<sup>5-7</sup>

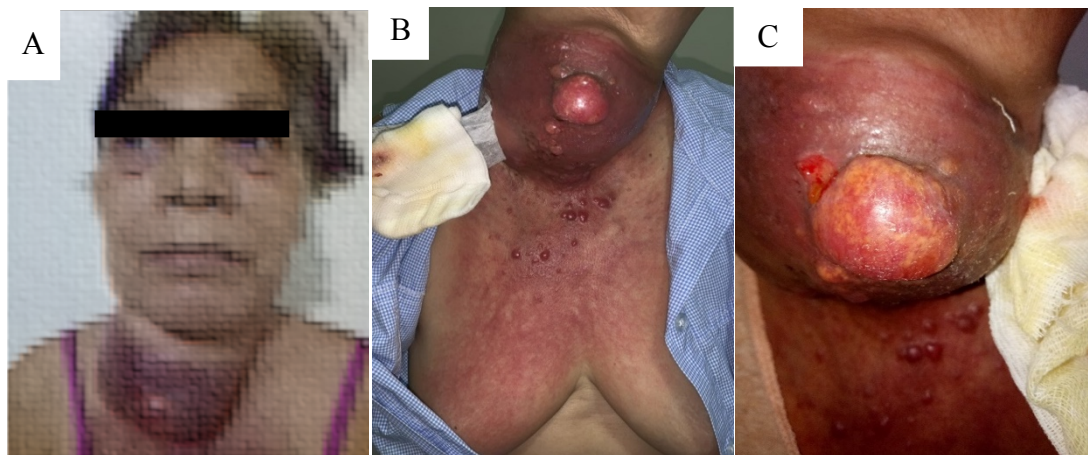
We report a case of a 64-year-old Filipino woman who presented with metastatic thyroid carcinoma

to the skin. In this patient, the skin lesions were the initial manifestation of thyroid cancer. Skin metastasis was the presenting feature of the underlying thyroid carcinoma in this patient. Examination of the skin lesions by conventional light microscopy aided by immunohistochemistry suggested the possibility of metastatic papillary thyroid carcinoma.

## Case Illustration

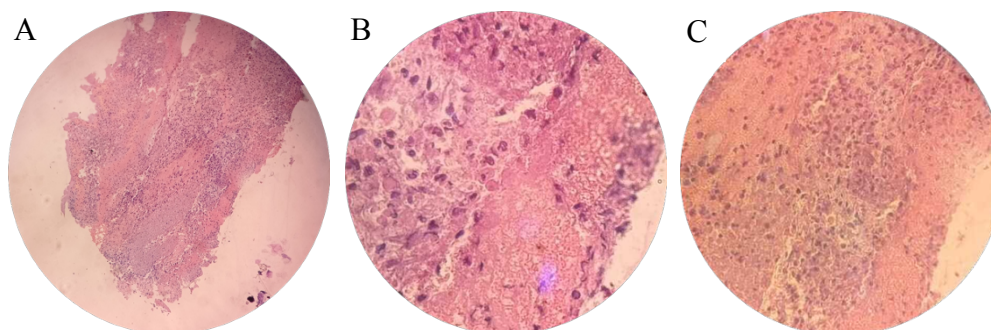
A 64-year-old woman without any family history of thyroid or other endocrine disease presented with an enlarged and tender nodule with a dimension of 2,5 cm x 3 cm on the right anterior neck since five years prior to admission. No discharge and ulceration was noted, but the patient complained of undocumented fever and recurrent pain with a Visual Analogue Scale of 8/10 at least once a week. The patient denied any history of self-medication. The patient initially came to a state hospital in Paranaque, Philippines, in which she was prescribed mefenamic acid and cephalexin. The patient felt slight pain relief, but no decrease in tumor size.

At the examination, the patient noted gradual enlargement of the mass, currently involving the entire anterior neck area with firm consistency and tenderness, measuring 10 cm x 6 cm with an increase in redness, more frequent episodes of pain, and undocumented fever. The patient was then referred to the Department of Dermatology OMMC Hospital with a known diagnosis of thyroid carcinoma 1 year prior to consult with the noted appearance of multiple, well-defined erythematous firm tender nodules measuring 1 cm x 1,5 cm to 4 cm x 3 cm on the anterior neck (figure 1). Three months prior to referral, the patient noted multiple erythematous patches topped with multiple papules and firm tender nodules and tumors measuring 0,5 x 0,5 cm to 12 x 8 cm on the anterior chest (figure 1). Subsequently, the patient underwent chemotherapy using doxorubicin 80 mg as the agent of choice and was given levothyroxine 100 mcg every 24 hours. Chemotherapy was given in four consecutive series every 21 days. However, it was later noted that the tumor had extensive invasion in the respiratory tract. A few weeks after the last chemotherapy session, the patient died on April 23, 2020, due to respiratory failure.



**Figure 1.** Clinical pictures of the patient. (A) A giant tumor covering almost the entire part of the anterior neck. (B) Erythema on the anterior chest indicating inflammatory processes around the primary lesion. (C) Close-up picture of the giant tumor topped with multiple erythematous nodules on the anterior neck.

Histologic examination seen in figure 2 of the chest nodule revealed dermal proliferation of small cells. Lymphovascular invasion is not visible. Neoplastic epithelial cells with enlarged, optically clear, empty nuclei with nuclear grooves, and overlapping nuclei in a microfollicular pattern were noticed, along with solid sheets of tumor cells composed of ovoid to spindle cells, large and pleomorphic, with abundant cytoplasm and increased mitotic figures.



**Figure 2.** Histologic examination (A) Dermal proliferation of small cell (4x magnification). (B) Neoplastic epithelial cells in a microfollicular pattern (40x magnification). (C) Solid sheets of tumor cells with abundant cytoplasm (10x magnification).

## Discussion

This patient initially presented with a solitary enlarging tender nodule on the anterior neck region since five years prior to admission with gradual enlargement, covering the anterior aspect of the neck. In the interim, the lesion developed into a number of erythematous patches, papules and nodules on the chest. A histopathologic examination of the chest lesion was later conducted and revealed similar type of malignant cells to her thyroid cancer. The age of our patient is 64 years old. Previous reports by Altinay *et al.*, Alwaheeb *et al.*, and Mukherjee *et al.* stated that most of the patients with cutaneous manifestation of thyroid cancer usually presented with older age (mean age of 55 and 65 years old according to Altinay *et al.*).<sup>2,3,6</sup> The lesion originally appeared as an indolent neck mass and rapidly developed into a larger mass along with multiple skin lesions extended onto the thoracic region. According to literature, thyroid carcinoma initially developed as a slow-growing neck tumor, usually followed by rapid disease progression, including tumor cell invasion to surrounding tissue.

On physical examination, the patient presented with multiple erythematous to violaceous papules, firm tender nodules and patches on the thoracic area seen in figure 1. Similar studies by Altinay, Tomar, Puri and Lira *et al* also reported tumor characteristics and stated that skin metastasis of thyroid tumor typically presents as coarse, rough, dry skin and slowly growing, solitary or multiple, erythematous, flesh-colored, violaceous or blue-colored papules or nodules, usually on the scalp, face, or neck. However, they also mentioned that skin involvement on the thoracic area, as observed in the present case, is extremely rare.<sup>6,7,9-11</sup>

A review article by Dahl *et al* on 43 cases of thyroid carcinoma with cutaneous metastases discovered that papillary thyroid carcinoma was the most common histologic type of thyroid cancer with cutaneous metastases, contributing as many as 41% cases, followed by follicular carcinoma (28%), and anaplastic carcinoma and medullary carcinoma, each type contributed to 15% cases. The scalp was the most common site of involvement.<sup>2,4,6,8</sup> In contrast, Koller *et al.* reported that follicular carcinoma has a greater preponderance of cutaneous metastases than papillary carcinoma. However, cutaneous manifestation of thyroid carcinoma has no gender predisposition, as men and women have equal risk. As in our patient, skin metastasis occasionally presents as the initial manifestation of occult thyroid carcinoma.<sup>2,6</sup>

Histopathologic examination (figure 2) of the chest lesion was also conducted in our patient, revealing dermal proliferation of small cells with neoplastic epithelial cells with enlarged, optically clear, empty nuclei with nuclear grooves, show us the manifestation and spread of the thyroid cells in the biopsy area tissue similar to report by Kwon H, et al. This proof us that the thyroid cell which supposed not to be in the thoracic area has extended from the primary lesion. Similar histopathologic findings were also reported in previous studies.<sup>2,7,9</sup>

There was not any surgical intervention conducted on the patient. Chemotherapy using doxorubicin 80 mg as the agent of choice along with levothyroxine 100 mcg every 24 hours were administered. Chemotherapy was completed in four consecutive series, each session was done every 21 days. According to the literature, the widest possible surgical approach may be applied in resectable tumors; those without unilateral extrathyroidal invasion at a diameter of <5 cm, or those without cervical lymph node involvement.<sup>6,7</sup> According to the findings of the radiological examination, the patient in our case had an advanced thyroid carcinoma and had no surgical options. Unfortunately, a few weeks after the patient had undergone the last chemotherapy session, she died due to respiratory failure. It was later revealed that the tumor had extensive invasion to the respiratory tract. As mentioned in previous studies, cutaneous invasion of cancer cells is an indicator of poor prognosis. Altinay *et al.* mentioned that although the combination of cisplatin and doxorubicin was a promising treatment option with a treatment response rate of 53%, their patient did not benefit from the treatment. Furthermore, although the average survival rate following cutaneous metastasis has been reported to be up to 19 months<sup>6</sup>, our patient succumbed to respiratory failure three months after skin metastasis.

## Conclusion

Cutaneous metastasis is a rare phenomenon of thyroid carcinoma. Papillary carcinoma is the most common histologic type of thyroid carcinoma with documented cutaneous manifestations. According to this report, cutaneous metastases mostly occur in the older age group, begin as a slow-growing mass that rapidly progresses into multiple malignant lesions, and are associated with poor prognosis despite adequate treatment. Further studies regarding the management and treatment of cutaneous metastasis in thyroid malignancy are

warranted to increase quality of life and improve the prognosis.

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## Conflict of Interests

None.

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