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Primary squamous cell carcinoma of the thyroid: an aggressive tumor diagnosed by fine needle aspiration cytology

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Background: Primary squamous cell carcinoma (SCC) of the thyroid is a rare tumor with a poor prognosis.
Case: The case of a 46-year-old female with SCC of the thyroid gland diagnosed by fine needle aspiration cytology is presented. The cytological features in the fine needle aspiration smears are described and the rapidly fatal progress of the tumor is underlined.
Conclusion: In this report, we presented a pure SCC of the thyroid gland with locally aggressive behavior which caused a fatal result and highlighted the contribution of fine needle aspiration cytology (FNAC) for a quick and reliable diagnosis.
Key words: Fine needle aspiration cytology, thyroid, squamous cell carcinoma

Introduction

Primary squamous cell carcinoma (SCC) of the thyroid is a rare tumor, occurring in less than 1% of thyroid malignancies.[1] This disease has a poor prognosis and most patients die from locally aggressive disease within one year.[1,2] In the literature, there are many reports describing the complications of such tumors, but we are not aware of any other report specifically regarding a rapid locally aggressive growth and invasion of the surrounding tissues in a short time causing a fatal result. Besides, the importance of fine needle aspiration cytology (FNAC) as a quick diagnostic tool is emphasized.

Case

A 46-year-old woman presented with a history of gradually enlarging anterior neck mass for the last four months. She was complaining of dyspnea and hoarseness. A neck CT revealed bilateral nodular lesions in the thyroid gland; the largest one measuring 8 cm in diameter in the right lobe (Figure 1). Clinical signs of tracheal compression were present.

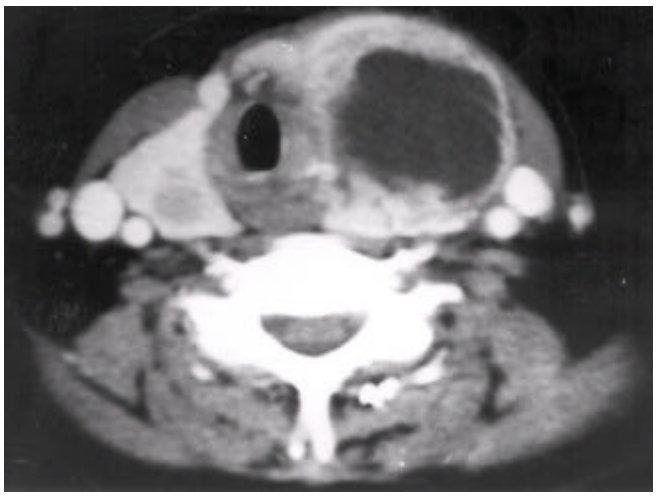

Figure 1. CT imaging of the patient showing bilateral nodular lesions in the thyroid gland at admission

Fine needle aspiration was performed and a dirty, mat and yellow-white colored, 60 cc cystic material was aspirated. Air dried smears were stained with May-

Grünwald Giemsa (MGG) and alcohol fixed smears and cytocentrifuge slides were stained with Papanicoloau. On microscopic examination, dispersed, single, keratinized, atypical squamous epithelial cells and deposits of eosinophilic granular keratin material were seen. The cells had bizarre shapes, densely hyperchromatic, enlarged nuclei, dense cytoplasm and well-defined cell borders (Figure 2a and 2b). The background of smears was dirty with necrotic material and inflammatory cells. The diagnosis of FNAC was squamous cell carcinoma, and a comprehensive search for metastatic squamous cell carcinoma was recommended.

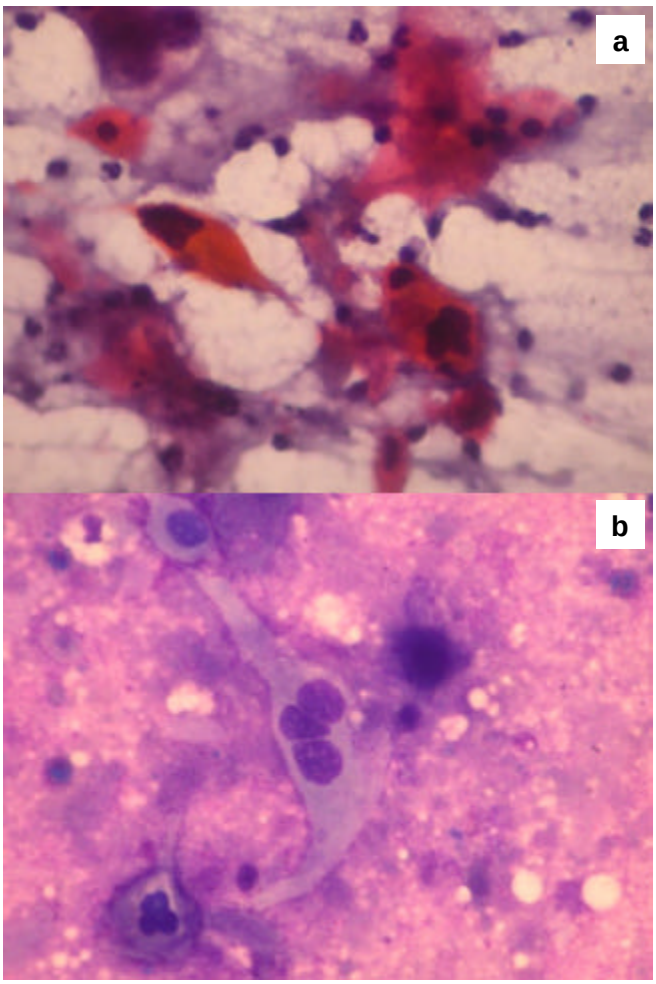

Figure 2, a. Keratinized, atypical squamous epithelial cells in FNA material (Pap; x400).
b. Atypical squamous epithelial cell within the dirty background of smear (MGG; x600).

Otorhinolaryngology consultation revealed unstable vital signs and an anterior neck mass about 5x10 cm in diameter. She was critically ill and cyanotic. Skin of the neck was intact. Left vocal cord paralysis was the only significant finding in indirect laryngoscopic examination. Tracheostomy was carried out and an incisional biopsy was taken.

The histologic examination confirmed the diagnosis of squamous cell carcinoma. The thyroid tissue was completely replaced by solid tumoral areas which were consisted of nests of the well differentiated squamous carcinoma cells and areas of the focal necrosis (Figure 3). Blood vessels were invaded as well. Anti-thyroglobulin antibody was performed to the paraffin blocks of the tumor with immunohistochemical method and positive immunostaining was seen on tumor cells. Dyspnea was resolved due to the tracheostomy but vital signs remained unstable afterwards. A whole body CT scan ruled out any other tumoral process. Within a few days, pneumonia and pericardial effusion had developed, and neither any surgical procedure nor chemotherapy/radiotherapy could be undertaken. The tumor enlarged progressively and infiltrated the neck skin. After one month from the admission, her second CT scan of the neck was revealed a huge necrotic mass originating in the left lobe of thyroid (Figure 4). The tumor invaded larynx, trachea, esophagus, and skin, and extended to angulus mandible and parapharyngeal space superiorly, incisura jugularis inferiorly, prevertebral fascia posteriorly. A whole bone scan showed increased radioactivity at 12^{th} thoracic vertebral bone. No other distant metastasis was found. Because of the pulmonary problems, the patient died on 25th days of the admission. Post-mortem examination was not accepted by her family.

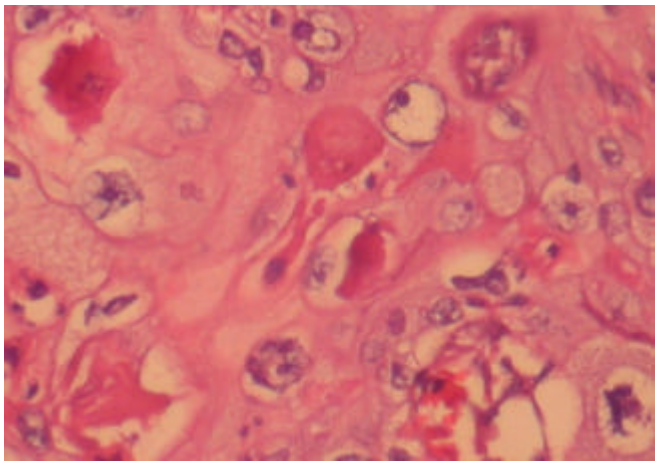

Figure 3. Well differentiated squamous carcinoma cells and areas of the focal necrosis (HE; x200).

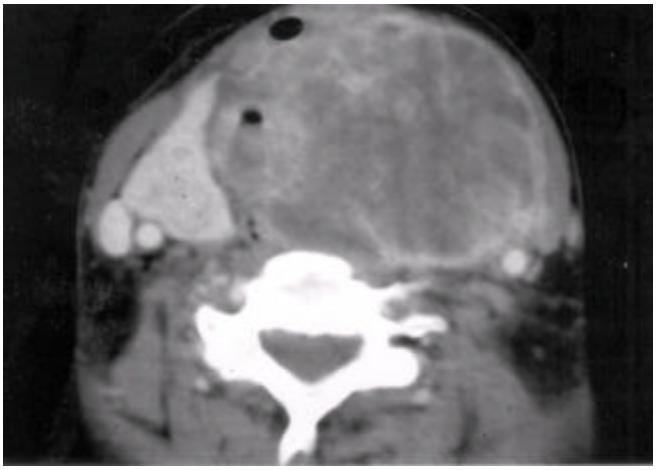

Figure 4. After one month from the admission, the second CT imaging of the neck showing a huge necrotic mass originating from left lobe of the thyroid

Discussion

Primary squamous cell carcinoma (SCC) of the thyroid is an uncommon neoplasm and has a poor prognosis. Li Volsi and Merino[3] suggested that in most cases this tumor develops as a result of metaplasia of follicular epithelial cells. Also Sahoo et al.[4] showed positive immunostaining with anti-thyroglobulin antibody of tumor cells as an evidence of follicular epithelial cell origin. Immunohistochemical finding of our case was similar with this article.

The main differential diagnosis of primary SCC includes SCC extending into or metastasizing to the thyroid gland from the larynx, esophagus, nasopharynx or lung. Most of the reported cases in the literature contained both SCC and adenocarcinoma and were interpreted as collision tumors. Our case is a pure SCC and no other primary site was identified. Squamous metaplastic changes may be taken into consideration in the differential diagnosis as it is commonly seen at widespread locations occurring in both reactive and neoplastic conditions of thyroid and can simulate tumors histologically. If it is extensive with associated degenerative changes and present clinically in the form of a nodule, pathologist must take care to differentiate the situation from primary or metastatic squamous cell carcinoma or even anaplastic carcinoma.[5]

SCC of the thyroid behaves clinically like anaplastic thyroid carcinoma[6], but histopathologically only poorly differentiated forms confuse with it. However, either well or poorly differentiated forms of primary thyroid SCC have typical poor outcome. Also, primary SCC of the thyroid may be found in association with the tall cell variant of papillary carcinoma (TCV). Kleer et al.[7] have studied eight patients with primary SCC of the thyroid. In four of eight cases, SCC of the thyroid was associated with TCV. In one case, the primary tumor had SCC and TCV; however, only the SCC component metastasized to the lymph nodes. Saunders and Nayar[8] defined this entity as "anaplastic spindle-cell squamous carcinoma" which has been reported as occurring in association with tall-cell papillary carcinoma. Because of the complete resection of the thyroid could not be performed, we could not carried out serial sections to the gland to rule out any other associated thyroid malignancy.

This tumor is capable of causing respiratory interference by direct invasion, compression of the respiratory system and/or nerve involvement.[9] Furthermore, at the time of diagnosis, these tumors are usually locally advanced with invasion into the trachea, esophagus, and major vessels.[2,10] The treatment is surgical resection of the thyroid gland with any involved structures and regional lymph nodes.[2,11] Although SCC of the thyroid is known to be radioresistant, there have been a few cases where complete excision and post-operative radiation have been curative.[2,11,12] This tumor is unresponsive to chemotherapy.[2,10,11] Death is usually secondary to progression of local disease within one year.[1,2]

Our patient was admitted with locally advanced thyroid mass, cyanosis and unstable vital signs. There was a tracheal invasion, but no distant metastasis was detected. Tracheostomy was required as a life saving procedure but unfortunately it caused pneumonia. Because of pneumonia and her poor condition, any therapeutic procedure (surgery, radiotherapy or chemotherapy) could not be started. In a period of twenty five days tumor size were coupled and skin infiltration, parapharyngeal and surrounding tissue invasion and distant metastasis were occurred.

FNAC is a well-known diagnostic tool and widely used in various thyroid lesions. In our patient this method provided the correct diagnosis. It must be kept in mind that FNAC can not help to differentiate primary from metastatic SCC of the thyroid.[13] When

performing FNAC, it is important to pay attention to the macroscopical appearance of the obtained material. Realizing that the material had a peculiar quality and quantity we were able to prepare several air-dried and wet fixed smears which were stained with MGG and Papanicolaou stains, respectively. Since the aspirated material was necrotic, wet fixed smears were interpreted much more easily.

In this report, we presented a pure SCC of the thyroid gland with locally aggressive behavior which caused a fatal result and highlighted the contribution of FNAC for a quick and reliable diagnosis.

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