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Diagnosis and Management of Anaplastic Carcinoma of the Thyroid

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ABSTRACT

A 47-year-old woman with anaplastic carcinoma of the thyroid is presented. The diagnosis was strongly suggested by a history of a longstanding nodule which began to grow rapidly. In spite of transient shrinkage of tumors secondary to a combination of radiotherapy and chemotherapy, the patient finally fell into respiratory failure owing to massive pleural effusion and multiple pulmonary metastases. As shown in this case, prognosis of anaplastic carcinoma of the thyroid is extremely poor. Therefore, whenever a thyroid nodule is found, further examination and appropriate treatment should be performed prior to the occurrence of anaplastic transformation.

KEY WORDS

Thyroid carcinoma, Anaplastic carcinoma, Thyroid scan, Radiotherapy, Adriamycin

INTRODUCTION

It is well known that thyroid carcinoma usually portends a good prognosis and can occasionally be present for years with no disability[1-3]. Survival of more than ten years is occasionally expected, even if it metastasized to lung and bones[4]. However, this possibility is limited to well-differentiated tumors, such as papillary and follicular carcinomas, which are characterized by slow growth of tumors and good response to radioiodine therapy. On the other hand, anaplastic (or undifferentiated) carcinoma of the thyroid is characterized by rapid growth of tumors and poor response to therapy[5].

In this report, a case of anaplastic carcinoma of the thyroid is presented.

CASE REPORT

A 47-year-old woman was admitted to a community hospital with complaints of cough and rapid growth of a thyroid tumor. Ten years ago the patient had noticed a thyroid mass, but she had ignored the presence of the mass. Physical examination revealed a palpable thyroid mass like ping-pong ball in size and swelling of cervical nodes. Three kg of body weight loss was observed during recent one week. Laboratory data was as follows : white blood cell (WBC) count 5400/μl (64% segmented neutrophils, 3% bands, 15% eosinophils, 4% monocytes, 12% lymphocytes), red blood cell count $344\times10^4/\mu$l, hemoglobin 9.5g/dl, hematocrit 29.1%, Reticulo 16%, platelet $20.3\times10^4/\mu$l, total protein 7.5g/dl, erythrocyte sedimentation rate (ESR) 35mm/hour, C-reactive protein 2.5mg/dl, serum iron 39μg/dl, and carcinoembryonic antigen (CEA) less than 1ng/ml. Thyroid function studies were within normal limits. Serum thyroxine level was 8.1μg/dl, serum triiodothyronine was 1.0μg/dl and TSH was 1.8μU/ml. Chest X-ray showed multiple coin lesions in both

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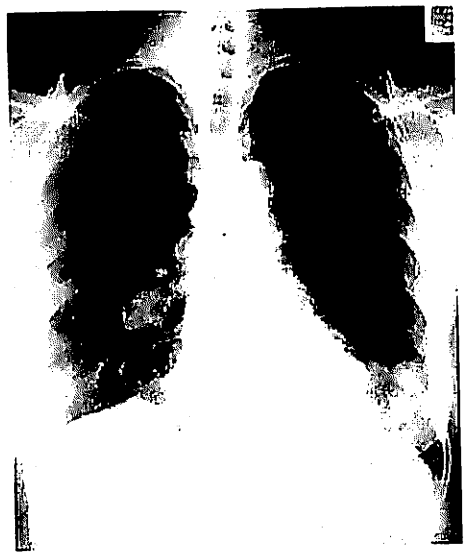

Fig. 1. Chest X-ray shows multiple coin lesions in both lobes of the lung, indicating pulmonary metastases.

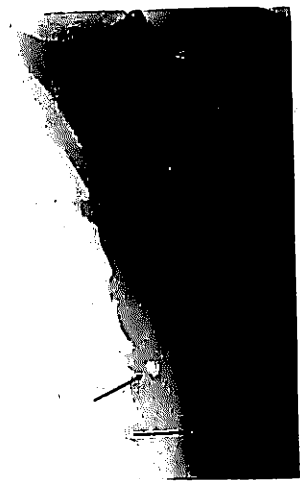

Fig. 2 Lateral view of cervical radiography shows egg-shell calcification at the site of the thyroid (arrow).

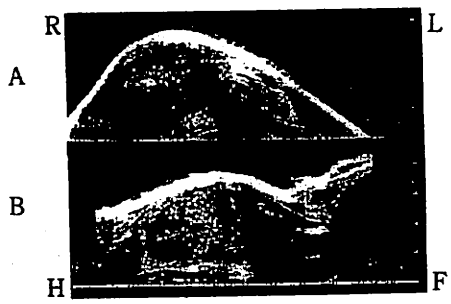

Fig. 3 Ultrasonography shows a hypoechoic solid mass in the right lobe of the thyroid. Tracheal deviation toward the left side is apparent. (A) : Transaxial, and (B) : sagittal scan. R : right, L : left, H : head, F : foot.

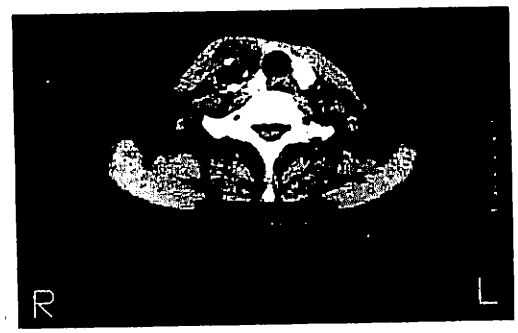

Fig. 4 X-ray CT scan shows a huge low density mass with egg-shell calcification in the right lobe of the thyroid.

lobes of the lung, indicating pulmonary metastases (Fig. 1). Cervical radiography showed egg-shell calcification at the site of the thyroid (Fig. 2). Ultrasonography (US) manifested a solid mass of 6×4.5×3.5cm in the right lobe of the thyroid. The mass was constituted of heterogeneous hypoecho. Tracheal deviation toward the left side was apparent in the transaxial scan (Fig. 3). Computed tomographic (CT) scan also demonstrated a huge low density mass with egg-shell calcification in the right lobe of the thyroid (Fig. 4). ^{99m}Tc thyroid scan showed decreased uptake in the right lobe of the thyroid (Fig. 5). ^{201}Thallium (Tl) scan also showed cold area, corresponding with a nodule (Fig. 6). These results suggested that the patient had thyroid carcinoma with multiple pulmonary metastases.

The patient was referred to our university hospital for radioiodine therapy. On admission, chest X-ray revealed definite enlargement of multiple coin lesions during one week. Because of the rapid growth of multiple metastases, anaplastic carcinoma of the thyroid was strongly suspected of. Other imaging modalities such as brain CT, abdominal US, and bone scan demonstrated no evidence of metastasis. Forty mg of adriamycin was injected with steroid hormone, immediately after needle biopsy of the thyroid mass prior to the histological confirmation. As immunotherapy, use of 1 KE of picibanil twice a week was adopted. External radiotherapy was planned as follows : A total dose of 19.2Gy (160cGy/day×12days) to 10×11 cm of the anterior neck using ^{60}Co δ-ray and a total dose of 24.0 Gy (200cGy/day×12days) to the tumor of 6cm in diameter using 8 MeV-linac electron beam.

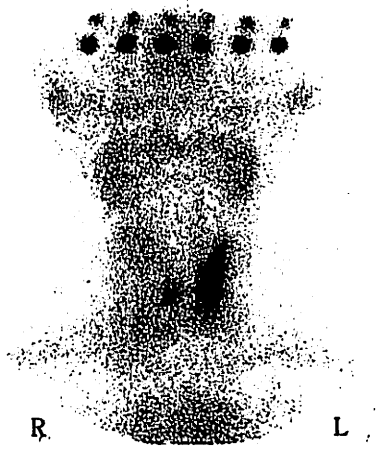

Fig. 5 **^{99m}Tc scan shows decreased uptake in the right lobe of the thyroid.**

Fig. 6 **^{201}Tl scan shows cold area, corresponding with the nodule (arrow head).**

As the results, a total dose to the thyroid tumor amounted to 43.2Gy.

The thyroid tumor was histologically diagnosed as anaplastic carcinoma (large cell type) of the thyroid. External irradiation was started three days later after the first injection of adriamycin. Next day the patient was much surprised with hemoptysis. After seventh irradiation, the patient complained of dysphagia and sore throat, suggesting esophagitis. At the same time, leukocytopenia of 2500 of WBC was revealed. Therefore, irradiation had to be prolonged. Consequently, given dose summed to 25.2Gy. In spite of leukocytopenia, bone marrow examination was within normal limits. After combined therapy, chest X-ray showed a dramatic decrease in size of pulmonary metastases. In addition, the thyroid mass significantly reduced from 4.5×3.5cm to 2.8×2.5cm in diameter. Therefore, it was considered that total thyroidectomy would be beneficial for the local control of thyroid carcinoma. However, the patient refused surgery. Then 60mg of adriamycin was administered.

After 40 days admission in our university hospital, the patient was transferred to the community hospital according to her desire. There, owing to leukocytopenia of 1400 of WBC, neither chemotherapy nor radiotherapy was commenced and immunotherapy alone was kept. Afterwards, since chest X-ray showed enlargement of pulmonary metastases, 60mg of adriamycin and a total dose of 30 Gy (200cGy/day×15days) to pulmonary masses using linac electron beam were given. After radiotherapy, pulmonary metastases of 2.2 and 2.3cm in diameter decreased to 1.3 and 1.9cm, respectively. However, contrary to shrinkage of tumors, general condition rapidly worsened. Moderate pleural effusion and consolidation were shown on chest X-ray. High grade fever did not disappear in spite of antibiotic treatment. Pseudomonas aerginosa was detected from sputum. Owing to massive pleural effusion and multiple pulmonary metastases, the patient finally had fallen into respiratory failure. Aspiration of 500 to 1000ml of pleural effusion was daily repeated. For a while after aspiration of pleural effusion, the patient was free of dyspnea. However, a few hours later the patient strongly complained of dyspnea. On the other hand, clear consciousness was preserved even immediately before death. Suffering from severe dyspnea for eight days, the patient attained to cardiac arrest. It was just four months from the patient's first medical examination.

DISCUSSION

Anaplastic carcinoma of the thyroid comprises about 10% of all thyroid cancers and occurs over 50 years old[1]. It has the characteristics in the process of rapid growth of tumor and of highly malignant owing to extensive local invasion. Expected survival does not exceed one year in the majority of cases. Also in this case, rapid advance in size, extension beyond the thyroid and widespread metastases were revealed. Another tumor which causes rapid growth in the thyroid is malignant lymphoma[2]. Malignant lymphoma arising in

the thyroid gland are rare and the incidence of primary lymphoma is said to be 1.7-8.0% of total thyroid malignant tumors[6].

In case of anaplastic carcinoma of the thyroid, are included inflammation findings such as local tenderness, leukocytosis, and increased ESR. Diagnostic imaging in anaplastic carcinoma of the thyroid has some morphological properties[1]. One of them is egg-shell calcification, which is smaller than the actual tumor size. Other property is intense uptake of ^{67}Gallium (Ga) citrate. Since intense uptake of ^{67}Ga, however, can be revealed also in malignant lymphoma, they can't be differentiated each other by ^{67}Ga scan. On the other hand, ^{201}Tl scan is usually more effective. In 35% of the patients with thyroid carcinoma with regional lymph node metastasis, uptake of ^{201}Tl was reported to be observed in metastatic lymph nodes[7]. The positive ^{201}Tl and negative ^{99m}Tc concentrations in the neck mass are usually observed in patients with thyroid carcinoma. However, even if uptake of ^{201}Tl was negative, thyroid carcinoma can't be denied[7].

In the presented case, no examination of the thyroid mass was performed for ten years. Therefore, histological diagnosis of the original tumor is unknown. Anaplastic carcinoma of the thyroid occasionally originates from well-differentiated carcinoma, especially papillary adenocarcinoma. Also in this case, recent transformation from a well-differentiated carcinoma into anaplastic carcinoma was guessed. As shown in this case, the prognosis of anaplastic carcinoma of the thyroid is extremely poor, even if appropriate chemotherapy and radiotherapy is performed. Adriamycin is reported to be more effective than other chemotherapeutic agents such as mustards, cytoxan, methotrexate, and mithramycin[1]. The amount of radiation is usually given from 35Gy to 60Gy over several weeks[5]. In this case a total dose of 55.2Gy was given. The most important thing is how well general condition can be preserved in patients receiving radiotherapy and chemotherapy.

In conclusion, the prognosis of anaplastic carcinoma of the thyroid is extremely poor, even when combined radiotherapy and chemotherapy is performed. Anaplastic carcinoma of the thyroid progresses so rapidly and poorly responds to radiotherapy and chemotherapy. On the other hand, well differentiated carcinoma is curable in vast majority of cases, if appropriate therapy is performed. Therefore, treatment of thyroid mass shold be commenced prior to the transformation from well-differentiated carcinoma into anaplastic carcinoma.

REFERENCES

1) Harrison TR : Harrison' principles of internal medicine. Mcgrawhill, pp. 518, 1762. 1977
2) Robbins J : Thyroid cancer, pp. 405-421, Year book medical publishers Inc., 1986
3) Robbins Sl and Angell M : Basic pathology. Saunders. pp. 601-603, 1976.
4) Mizukami Y, Michigishi T, Nonomura A, Hashimoto T, Terahata S, Noguchi M, et al : Distant metastases in differentiated thyroid carcinomas : A clinical and pathologic study. Hum pathol 21 : 283-290, 1990
5) Kyriakides G, Sosin H : Anaplastic carcinoma of the thyroid. Ann. Surg. 179 : 295-299, 1974
6) Mizukami Y, Michigishi T, Nonomura A, Nakamura S, Hashimoto T, Katsuda S, et al : Primary lymphoma of the thyroid : a clinical, histological and immunohistochemical study of 20 cases. Histopathology 17 : 201-209, 1990
7) Michigishi T, Mizukami Y, Mura T, Nomura T, Watanabe K, Tonami N, et al : Papillary carcinoma in ectopic thyroid detected by Tl-201 scintigraphy. Clin Nucl Med 16 : 337-339, 1991

甲状腺未分化癌の診断と管理

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要　　旨

甲状腺未分化癌の患者に放射線療法と化学療法の併用を行ったところ，一過性に腫瘍の縮小を認めた。しかし，最終的には大量胸水と肺転移のため呼吸不全に陥り死亡した。本症例では10年前から甲状腺腫瘤を認めており，最近急速に増大したことから，分化癌から未分化癌への転換が生じたと考えられた。本症例が示すように未分化癌の予後はきわめて不良であるので，未分化転換がおこる前に甲状腺分化癌を診断・治療することが重要である。