Spinal Cord Compression as Initial Presentation of Follicular Thyroid Carcinoma

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Follicular thyroid carcinoma with metastasis rarely manifests as spinal cord compression without any previous symptoms of its malignancy. This report describes a 64-year-old man with follicular thyroid carcinoma who presented initially with left arm motor weakness. Magnetic resonance images demonstrated severe cervical cord compression by a mass with destruction of C4 vertebra. Corpectomy of C4 and anterior interbody fusion was carried out. Histopathological study revealed a metastatic follicular carcinoma of the thyroid. We present our case, especially focused on its possible pathophysiology, with review of pertinent literatures.

**KEY WORDS**: Spinal cord compression · Thyroid carcinoma · Metastasis.

### Introduction

Thyroid cancer is a unique tumor associated with excellent long-term survival, even in the presence of distant metastasis. Distant metastasis in thyroid cancer is well known, but develops in about 9 percent of patients with differentiated thyroid cancer. Also, only 4 percent of patients with differentiated thyroid cancer presents initially with distant metastasis. Follicular thyroid carcinoma is a slow-growing tumor, nevertheless, early hematogenous spread occurs to the lung and bone. However, it is extremely rare that follicular thyroid carcinoma manifests initially as spinal cord compression without any previous symptoms of malignancy. To our knowledge, only 7 similar cases have been reported in the literature to date. We summarized our case and discussed its pathophysiology with relevant literatures.

### Case Report

A 64-year-old man experienced sudden progressive weakness of left arm two weeks before admission. He had previously been in good health and his medical history was unremarkable. Physical examinations revealed no definitive mass lesion or tenderness in the neck. He had neither neck pain nor radiating pain. Neurological examinations revealed a cervical myelopathy with weakness of left arm (grade IV). Lateral X-ray of the cervical spine showed extensive destruction and collapse of C4 vertebral body. Magnetic resonance (MR) images showed severe cord compression by a mass with destruction of C4 vertebral body and a well-enhanced mass around left side of C4 vertebra. Severe displacement of the cervical cord by the mass protruding into the spinal canal was also observed, which appeared like cord transection (Fig. 1). Computed tomography (CT) scans of the cervical spine showed extensive destruction of C4 vertebral body, left-sided pedicle, lamina, and spinous process (Fig. 1). Our differential diagnosis of the underlying diseases was tuberculous or pyogenic spondylitis, least likely, the metastatic cancer. The laboratory results including complete blood cell counts, erythrocyte sedimentation rate, C-reactive protein, etc. were within normal ranges. Tumor marker studies including carcinoembryonic antigen, CA 19-9, α-fetoprotein, prostate specific antigen, neuron specific enolase, calcitonin, etc. were all within normal ranges. We could not find a definitive cause of the cervical lesion.

On the 14th hospital day, left leg weakness (grade IV) suddenly developed. Also, he showed a progressive weakness of left arm (grade III). He underwent urgent surgery for the cervical lesion of an unknown etiology. The collapsed C4 body was completely...
resected via anterior approach and the cervical cord was decompressed. Interbody fusion with autogenous iliac bone graft was carried out. Histopathological study confirmed metastatic follicular carcinoma of the thyroid (Fig. 2).

Postoperative CT scan of the neck showed a well-circumscribed, 2.5 × 2.0cm sized, occult mass in left lobe of the thyroid (Fig. 3). Fine needle aspiration biopsy of the thyroid disclosed suspicious follicular carcinoma of the thyroid. Radionuclide bone scans showed multiple bone metastasis to T12, manubrium of sternum, and rib (Fig. 3). Left hemiparesis of the patient was improved postoperatively (grade V). The patient was then transferred to thyroid specialist for further evaluation and treatment.

Discussion

Spinal cord compression usually occurs in patients with metastatic systemic cancer. Lung, breast and prostate are the most common sources of vertebral metastases, however, thyroid cancer infrequently metastasizes to the vertebrae. Barron et al. reviewed 127 autopsy cases with spinal cord compression due to metastatic malignancies, only three of which originated from thyroid cancer.

Follicular thyroid carcinoma, classified as a well-differentiated carcinoma, has a slow growth rate and presents as a solitary nodule or remains as an occult cancer. Follicular thyroid carcinoma is more likely to be manifested as a distant metastasis than papillary type. These clinical features are based on an unique biology of follicular thyroid carcinoma. It presents
as an encapsulated, expansible neoplasm with microfollicular pattern. Its histopathological hallmark is invasion of the tumor capsule and extension into blood vessels at its periphery. Therefore, it undergoes early hematogenous spread, preferentially affects lung and bone. However, as compared with other solid cancers, distant metastasis is not common event occurring in about 9 percent of patients with differentiated thyroid cancer. Interestingly, thyroid cancer is the most common primary neoplasm with vertebral metastasis as its initial manifestation. It is probably due to indolence of differentiated thyroid cancer without subjective symptoms. This would mean that differentiated thyroid cancer is probably the most indolent tumor with a benign clinical course. On the other hand, lung or breast carcinomas, that have strong tendency of vertebral metastasis, are easily detected by distinct symptoms from primary cancer.

Spinal cord compression as a complication of thyroid cancer is uncommon. Moreover, it occurs mainly late in the course of this disease. This could result from local extension of the primary tumor to the cervical spine or hematogenous spread to the vertebrae. Like primary cancer of the thyroid, lesions metastatic to the spine from thyroid cancer are also slow-growing and usually remain well-localized to one region of the epidural space for many months. Patients with such lesions usually present gradual spinal cord compression.

Because of unusual presentation, and clinical rarity, it is likely to be diagnostic challenge to clinicians. Routine physical examinations and laboratory findings for metastatic disease of an unknown origin are unlikely to raise a suspicion for an occult thyroid cancer. Only 0.13% harbor a thyroid metastasis in patients with known spinal or brain metastases. Therefore, routine work-up of the thyroid with CT or MR imaging in metastatic spinal tumors are not usually recommended. Also, independent palpation of the thyroid without clinical suspicion don't have sufficient value in mass screening for a thyroid cancer. With regard to the evaluation of a patient presenting with a spinal mass of an unknown origin, a careful history-taking and a thorough physical examination after a clinical suspicion for thyroid cancer are mandatory.

In summary, there are several clinically interesting aspects in this case. First, there was no neck pain in spite of severe vertebral destruction by metastatic thyroid carcinoma. Second, follicular thyroid carcinoma with multiple distant metastasis had no subject symptoms as a terminal disease besides arm weakness. Finally, spinal cord compression was initial manifestation of follicular thyroid carcinoma. These unusual manifestations of follicular thyroid carcinoma are likely to be brought about its peculiar tumor biology including a slow growth rate, but, early hematogenous spread. Therefore, its disease course remains relatively benign even after presenting as a distant metastasis and is associated with excellent long-term survival.

**Conclusion**

We report an uncommon case of follicular thyroid carcinoma manifested as a vertebral metastasis with spinal cord compression without any previous symptoms related to the primary thyroid cancer. Although it is rare, thyroid cancer should be considered in the differential diagnosis of every newly diagnosed case of spinal cord compression.

**References**