

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 of 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 cancer¹². Also, only 4 percent of patients with differentiated thyroid cancer presents initially with distant metastasis¹³. Follicular thyroid carcinoma is a slow-growing tumor, nevertheless, early hematogenous spread occurs to the lung and bone¹². However, it is extremely rare that follicular thyroid carcinoma manifests initially as spinal cord compression without any previous symptoms of malignancy⁷. To our knowledge, only 7 similar cases have been reported in the literature to date^{2,5-7,9}. 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). Computerized 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

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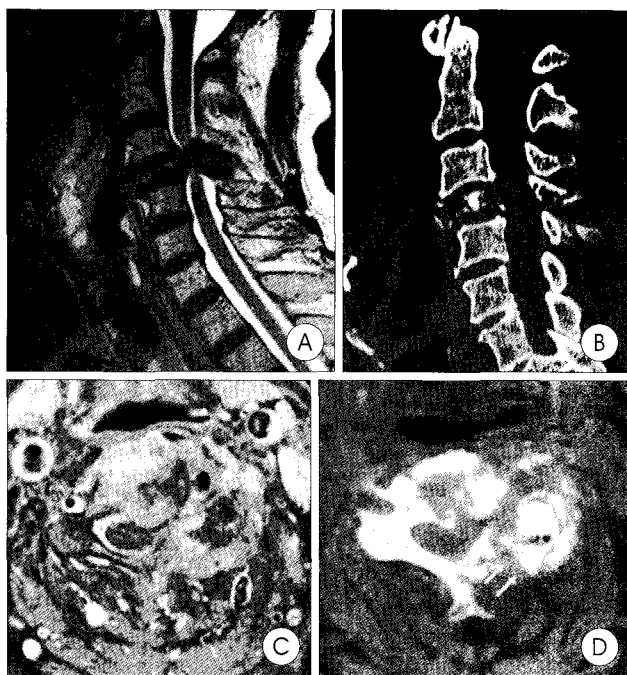


Fig. 1. Preoperative magnetic resonance images and computerized tomography scans. (A, C) Sagittal T2-weighted image shows severe compression of the cord behind the C4 vertebra and axial T1-weighted image after gadolinium injection depicts the extent of the tumor mass destructing the whole C4 body, pedicle, facet joint and lamina of the left side. (B, D) Sagittal image shows collapse of C4 body and axial image reveals osteolytic lesions of left-sided pedicle, lamina, spinous process and especially, and fracture of lamina (white arrows). Note the coexisting involvement of both anterior and posterior elements of the vertebra by the lesion.

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 × 2.0 cm 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^{1,8)}. Barron et al.¹⁾ reviewed 127 autopsy cases with spinal cord compression due to metastatic malignancies, only three of which originated from thyroid cancer.

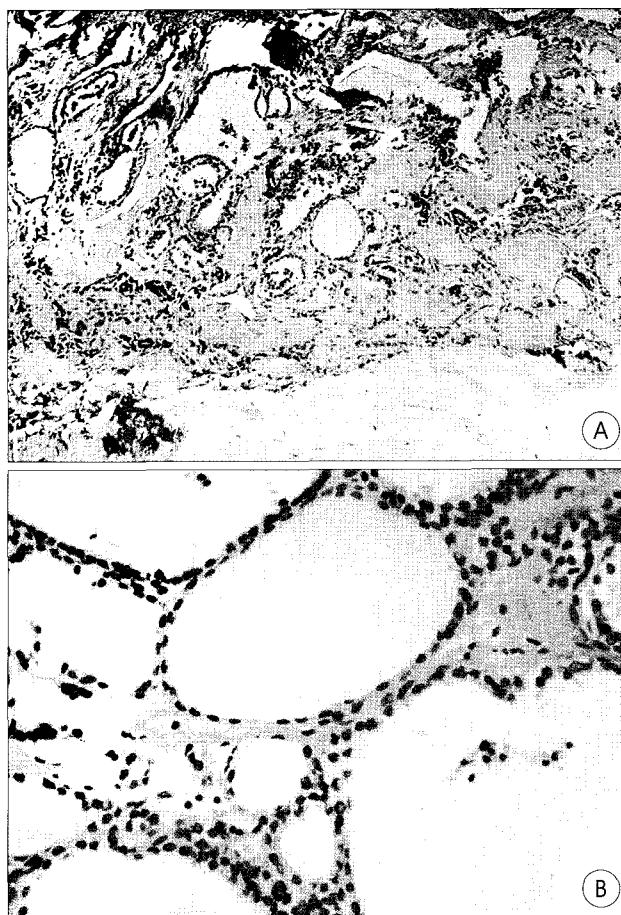


Fig. 2. Photomicrographs of the cervical lesion demonstrating thyroid follicles filled with colloid (white arrow) and disc materials (white arrowheads) (H&E, A : ×100, B : ×400).

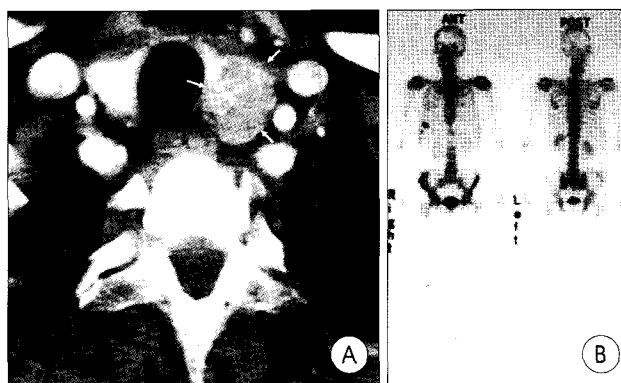


Fig. 3. Postoperative neck computerized tomography scans and radionuclide bone scans. (A) Neck computerized tomography scan discloses a well-circumscribed, 2.5 × 2.0 sized, round mass of left thyroid (white arrows). (B) Radionuclide bone scans show multiple bone metastases to the T12 vertebra, manubrium of the sternum, and rib.

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 type¹³⁾. These clinical features are based on a 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 bone¹². However, as compared with other solid cancers, distant metastasis is not common event occurring in about 9 percent of patients with differentiated thyroid cancer¹². Interestingly, thyroid cancer is the most common primary neoplasm with vertebral metastasis as its initial manifestation⁸. 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 has 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 the disease. This could result from local extension of the primary cancer to the cervical spine¹⁰ or hematogenous spread to the vertebrae^{2,5-7,9}. 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 months⁴. 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 a occult thyroid cancer. Only 0.13 % harbor a thyroid metastasis in patients with known spinal or brain metastases³. 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 cancer¹¹. With regard to the evaluation of a patient presenting with a spinal mass of an unknown origin, a careful history-taking and a through 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 a 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.

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