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Metastasis of Follicular Carcinoma of the Thyroid to the Lumbar Vertebrae: A Case Report

Tiroid Folliküler Karsinomasının Lomber Vertebraya Metastazı: Olgu Sunumu

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ABSTRACT

Spinal cord compression due to follicular thyroid carcinoma is rare. We report an unusual case of isolated vertebrae metastasis of follicular thyroid carcinoma presenting with spinal cord compression. It is unusual for this neoplasm to initially present as a single metastasis to the spine. Comprehensive preoperative work up for metastatic tumors of vertebrae is important. This should include evaluation of the thyroid gland consisting of detailed clinical history and physical examination.

KEY WORDS: Metastasis, thyroid carcinoma, spine, vertebrae

ÖZ

Folliküler tiroid karsinoma metastazına bağlı omurilik basısı nadirdir. Omurilik basısı ile kendini gösteren folliküler tiroid karsinomasının izole omurga metastazı olgusu sunulmaktadır. Bu neoplazmın başlangıçta omurgaya tek metastaz şeklinde ortaya çıkışı nadirdir. Omurganın metastatik tümörlerinde ameliyat öncesi kapsamlı araştırma yapılması önemlidir. Bu araştırma, detaylı klinik öykü ve fizik muayeneyi de kapsayan tiroid bezi değerlendirmesini içermelidir.

ANAHTAR SÖZCÜKLER: Metastaz, tiroid karsinomu, omurga, vertebra

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INTRODUCTION

Follicular thyroid carcinoma, the second most common cancer of the thyroid gland, is a slow-growing tumor (12). The lesion tends to occur in older age groups, with a peak incidence in the fifth decade. It is three times more common in females than in males. Distant metastasis may commonly occur in the bones, brain, and lungs (2, 12). Follicular thyroid carcinoma rarely manifests itself as a distant metastatic lesion that causes distal spinal cord compression. The incidence of distant metastasis of follicular thyroid carcinoma has been reported as between 11 and 25% (5, 14). The incidence of initial presentation as distant metastasis is unknown.

We present an unusual case of isolated spinal metastasis of the follicular thyroid carcinoma presenting with spinal cord compression.

CASE REPORT

A 33-year-old woman presented with low back pain and weakness of both lower extremities. She had developed persistent low back pain twenty months ago which was partially alleviated only by physiotherapy. Neurological examination revealed paraparesis with hyperreflexia of the lower extremities and an inconsistent sensory loss in the right L3-4-5 dermatomes. On physical examination, she had an approximately 8x5 cm. anteriorly-located neck mass which was immobile and firm.

Laboratory investigations revealed normal hematological and biochemical parameters. Serum tumor markers and thyroid hormone levels were also normal. Lateral lumbar spine plane X-rays showed height loss at the L3 vertebral body. Cervical and thoracal spine x-rays were normal. Computerized tomography (CT) of the spine showed osteolysis of the L3 vertebral body and pedicles and narrowing of the spinal canal. Magnetic resonance imaging (MRI) showed abnormal areas of low signal intensity on T1-weighted image of the mass lesion at the L3 vertebral body and pedicles (Figure 1). The narrowing of the spinal canal due to the extradural mass was also seen on sagittal MRI scan (Figure 2). Thyroid ultrasound study revealed a 50x45mm solid nodule in the left thyroid lobe. A thyroid scan showed a cold area in the left thyroid lobe. The patient underwent whole body bone radioactive iodine scan that showed intense radioactivity at the L3 vertebrae. The cranial and abdominal CT scans of the patient were normal. She was operated immediately because of progressive paraparesis. During surgery the L3 vertebral body was totally resected and a human femur allograft was inserted via the anterolateral approach. The L2-L4 spine was stabilized by spinal implants (Figure 3). Histological examination revealed a metastatic thyroid carcinoma with a predominantly follicular pattern (Figure 4). The patient then underwent total thyroidectomy and whole body iodine 131 (I-131) was administered for internal radiation. Histopathological examination of the thyroidectomy specimen also showed follicular carcinoma. Two weeks later, weakness of the lower extremity and

Figure 1. Contrast-enhanced axial T1-weighted MRI scan of the lumbar spine showing the narrowing of the spinal canal due to the extradural mass at L3 vertebral body and pedicles.

Figure 2. Contrast-enhanced sagittal T1-weighted MRI scan of the lumbar spine showing the L3 compression fracture due to the metastasis.

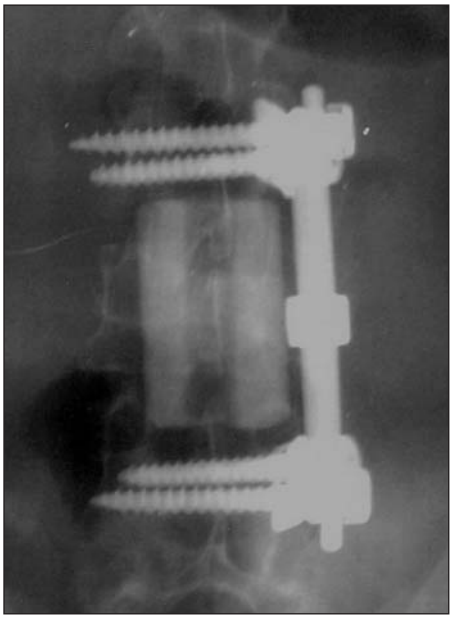

Figure 3. Postoperative X-ray showing the spinal instrumentation.

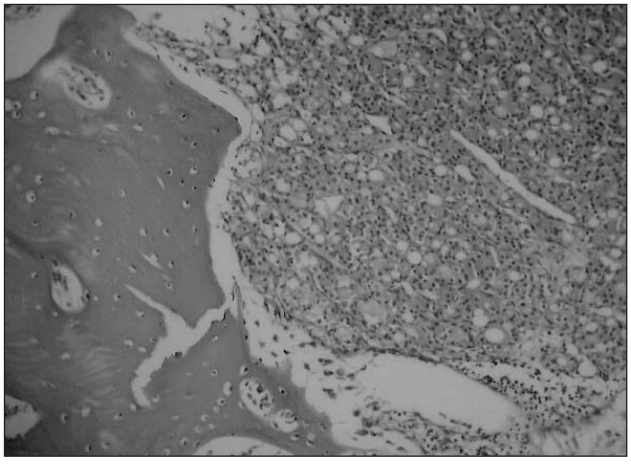

Figure 4. Histopathological examination showing thyroid follicular carcinoma metastasis (H.E. x100).

low back pain had partially improved.

DISCUSSION

About 1% of cancers in humans are thyroid in origin (6). Follicular carcinoma is the predominant element of malignant tumors of the thyroid and is the second most common differentiated thyroid malignancy (8, 12). It accounts for 20% to 30% of all thyroid carcinomas and is usually seen in elderly females, primarily those with a long-standing non-toxic multinodular goiter, unlike our case (6, 12). Approximately 80% of patients with follicular thyroid carcinoma are found to have a non-toxic solitary thyroid nodule, and it can also be rarely seen in patients with endemic goiter (12).

Solan reported that about 25% of patients with follicular carcinoma have distant metastasis (15). Harkness et al reported the incidence of distant metastatic spread from angioinvasive follicular carcinoma as 10% to 50% (7). It has been reported that the incidence of presentation with distant metastasis increases among patients over 45 year of age, and the age at presentation is the single most important prognostic factor in metastatic thyroid carcinomas (4, 12). Nam et al reported that 75% of patients with distant metastasis from thyroid carcinomas die within five years of diagnosis (10). The survival of patients is influenced by the patient's age at diagnosis, the histological patterns of the tumor, and the location of metastasis (6, 10, 13).

Follicular carcinoma is known to develop vascular invasion frequently with the most common metastases being to the lung, bone and lymph nodes (5, 10). Fanchiang et al reported the occurrence rate of bony metastasis in thyroid carcinomas as 4.3% and 71% of all cases (4). McCormack stated that the reported incidence of distant metastasis of thyroid carcinoma to bone varies from less than 1% to more than 40% (9). Baron et al reported that only three cases of metastasis of the thyroid carcinoma to the thoracolumbar spine were found in 127 autopsy specimens with neoplasms (1).

There are few reports regarding initial presentation of a patient with distant metastasis leading to the diagnosis of follicular thyroid carcinoma (6, 12-14). Metastasis of thyroid carcinoma presenting as a distal spinal cord compression is extremely rare. Shaha et al reported the incidence of distant metastasis as 11% in 1038 patients with thyroid cancer, in which 4% presented initially with distant metastatic carcinoma (14).

Routine thyroid function studies are not adequate to detect thyroid carcinoma. Ragni et al reported that the incidence of thyroid cancer in patients with elevated thyroid function studies was very low at 0.3% (11). Routine thyroid gland or thorax CT/MRI has been utilized in patients with metastatic tumor of unknown origin due to its supposed low yield.

In our patient, the tumors at both the thyroid gland and the L3 vertebrae were removed completely. The best treatment in cases of metastasis of thyroid carcinoma includes complete excision of the thyroid gland and removal of the metastatic foci

as much as possible (2, 6, 10, 13). Complete surgical excision of distant metastases of thyroid carcinoma has been reported to present the best chance of prolonged survival (10, 13). Biopsy followed by radiotherapy and I-131 internal radiation are other treatment options recommended for highly vascularised and/or inoperable metastatic vertebral tumours (3).

To summarize, comprehensive preoperative work up for metastatic tumors of the vertebrae is important. This should include evaluation of the thyroid gland consisting of detailed clinical history and physical examination in cases of metastatic tumors of vertebrae of unknown origin.

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