

Myelopathy as a Presentation of Cervical Spine Metastasis: A Case Report

Ramin Shayan-Moghadam^{1,2} , Mosayeb Soleymani^{1,2}, Hassan Zolghadr^{1,2},
Mohammad Hossein Nabian^{1,2}, Saeed Reza Mehrpour^{1*}

¹Department of Orthopedic and Trauma Surgery, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

²Center for Orthopedic Trans-Deciplinary Applied Research, Tehran University of Medical Sciences, Tehran, Iran

Email: *mehrpour_saeed@yahoo.com

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Abstract

Cervical myelopathy is a consequence of spinal cord compression in the cervical spine. Degenerative cervical spondylosis, osteophytes, discosteophyte complex, degenerative spondylolisthesis and hypertrophy of ligamentum flavum are the main etiologies of cervical myelopathy. Metastasis to cervical spine could be a rare cause of cervical myelopathy. The present study is a case report; presented a 36-year-old male with severe pain in cervical region, gait disability and impairment in sensory and motor function of upper left extremity. The patient had a history of thyroidectomy and cervical lymph node dissection due to follicular thyroid carcinoma (FTC) with improper follow-ups. He was diagnosed with metastatic cervical myelopathy and underwent surgical treatment. Cervical myelopathy due to metastasis is a rare condition and only few cases have been reported so far. So myelopathies can be a complication of metastatic cancers, and it should be considered by health professionals.

Keywords

Myelopathy, Metastasis, Thyroid Cancer

1. Introduction

Compression of the spinal cord in the cervical spine causes cervical myelopathy [1]. Fine motor skills disturbances, pain or stiffness in the neck, loss of balance, and gait impairments are main clinical symptoms of patients with cervical myelopathy [2]. This condition accounts as a common degenerative situation that presents in older patients with symmetric numbness and tingling in the extremities. Main etiologies of cervical myelopathy are degenerative cervical spondylo-

sis, osteophytes, discosteophyte complex, degenerative spondylolisthesis and hypertrophy of ligamentum flavum [3]. Congenial spinal canal narrowing is also another cause for this disease [4]. Other less common etiologies for cervical myelopathy include ossification Posterior Longitudinal Ligament, tumors, epidural abscess, trauma and cervical kyphosis.

Mainly, these etiologies result in direct cord compression or ischemic injury secondary to compression of anterior spinal artery that in turn, causes the clinical presentations [5]. Incidence of cervical myelopathy has been estimated about 4.04/100,000 person-years in the United States that are more commonly related to the degenerative cervical spondylosis, osteophytes, discosteophyte complex, congenital causes, degenerative spondylolisthesis and hypertrophy of ligamentum flavum [6].

Metastatic thyroid cancer is one of the rare etiologies of cervical myelopathy. Incidence of bone metastases in patients with thyroid malignancies is 2% - 13% and only 14% of patients with bone metastasis of thyroid cancer developed cord compression [7] [8]. Early diagnosis and appropriate treatment approach is mandatory for achieving satisfactory results in management of the disease [9]. Given the rarity of myelopathy due to cervical spine metastasis of thyroid cancer and the importance of early and precise treatment of the disease we felt compelled to report the case presented with symptoms of cervical myelopathy and follicular thyroid cancer.

2. Case

A 36-year-old male was referred to our medical center due to severe pain in cervical region, gait disturbance and impairment in sensory and motor function of upper left extremity. Cervical pain has been initiated since 2 years ago. The pain was intermittent at first, but increased in frequency and severity during this period. The pain severity increased significantly from 1 month before his admission that was associated with weakness and tingling in both upper and lower extremities especially in the upper left limb. Gait disturbance was added to his symptoms two weeks before admission.

Past medical history of the patient was total thyroidectomy and cervical lymph node dissection due to follicular thyroid carcinoma (FTC). After the surgery, patient was recommended to undergo radioactive iodine therapy but he refused the treatment. Over-the-counter analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) were the only drugs consumed by the patient.

In physical examination, he had normal general appearance and normal skin examination. He walked with wide based gait. On examination of the upper limbs, range of motion (ROM) of all joints was normal and no tenderness was detected. Strength of the proximal and distal muscles of the left upper limb was four out of five according to muscle strength grading system that was weaker compared to the contralateral limb. The biceps, triceps and brachioradialis reflexes were decreased significantly. The distal pulse on both sides was palpable and symmetric,

and the Hoffman test was positive on the left. Lhermitte sign and finger escape sign were observed in cervical movements and left limb, respectively. We recorded decreased muscle strength in left lower limb compared to the right (four out of five according to muscle strength grading system). Sensory examinations and reflexes of patella and Achilles tendon were normal on both sides.

Imaging evaluations showed cortical disruption of C5 and C6 vertebrae and severe canal stenosis (**Figure 1**). The patient became a candidate of initial posterior laminectomy and lateral mass screw implantation using posterior approach (**Figure 2**) and then corpectomy and interbody fusion from the anterior (**Figure 3**). The tissue specimen was sent for pathologic assessment in the day of surgery. Report of pathologic assay was trabecular pattern of follicles with no necrosis that was consistent with the diagnosis of follicular patterned thyroid carcinoma (**Figure 4**).

Post-operative CT scan showed successful decompression of spinal cord (**Figure 3**). Cervical region pain had been improved significantly in early follow up visit, however weakness and tingling in both upper and lower extremities and also gait disturbance still remained. Symptoms of myelopathy, both sensory and motor, clearly improved during monthly follow up visits. Axial pain disappeared and the patient's gait disturbance resolved completely six months after surgery. After twelve months of follow-up, no sign and symptom of myelopathy, pain, gait disturbance, and fine motor abnormality have been recorded. The patient is



Figure 1. Pre-operative imaging of the patient. (A) and (B) Anterior-posterior and lateral X-ray of the cervical spine; (C) T1-weight MRI; (D) T2-weight MRI.



Figure 2. Patient's cervical spine during and after posterior instrumentation.

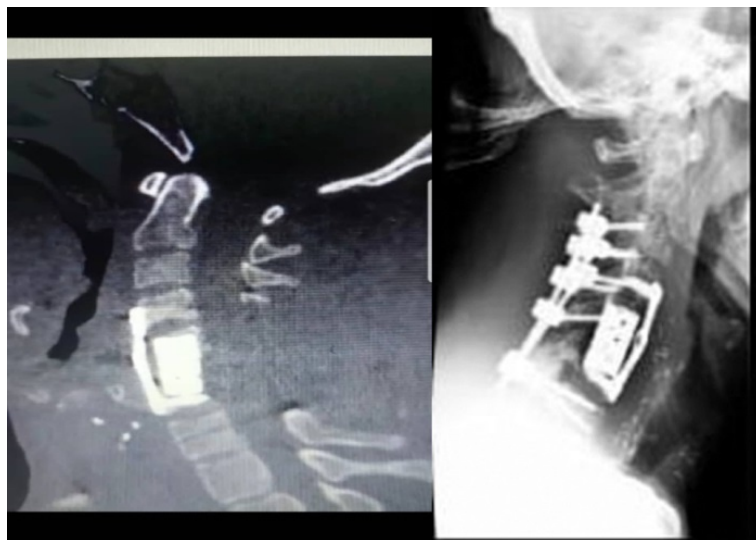


Figure 3. Post operation CT scan indicating relieved spinal cord.

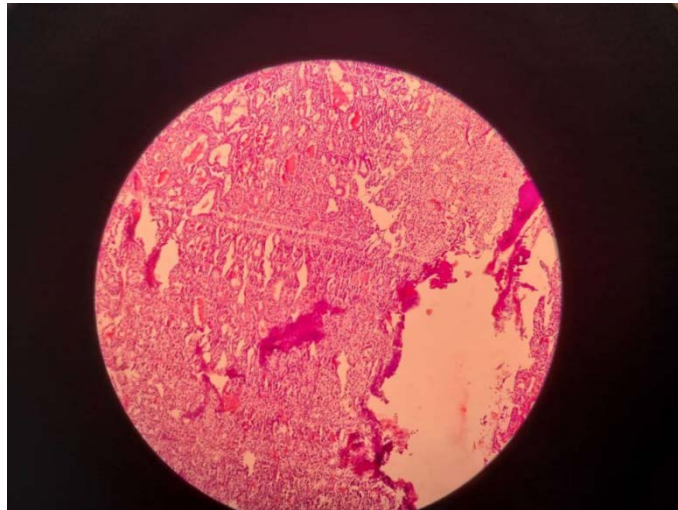


Figure 4. Pathology evaluation of the extracted tissue sample indicating metastatic follicular patterned thyroid carcinoma. Magnification time: 40×.

under the treatment of follicular thyroid carcinoma right now.

Written informed consent was obtained from the patient for anonymized patient information to be published in this article.

3. Discussion

This study presents a rare case of cervical myelopathy due to metastasis of thyroid cancer. The patient had severe pain in cervical spine region, gait disturbances and impairment in sensory and motor function of upper left extremity. These clinical presentations could be highly suggestive of cervical myelopathy. Cervical myelopathy due to metastasis is a relatively rare condition that only few cases have been reported.

Incidence of bone metastases in patients with thyroid malignancies is 2% - 13% [8]. Skeletal-related events (SRE) such as pathological fracture, spinal cord compression, hypercalcemia, and need for external beam radiation or bone surgery, is described in patients with bone metastasis from various origins. Although there are numerous studies on bone metastases and SREs in malignancies other than thyroid cancer, very little information exist about bone metastases of thyroid tumors and related SREs [10] [11] [12]. The risk of development of SREs in patients with bone metastases from non-small-cell lung cancer, prostate cancer, and breast cancer was reported to be 48%, 49% and 68% respectively [4]. There is little data about the risk of development of SREs' bone metastasis of thyroid cancer. However Pittas et.al showed only 14% of patients with bone metastasis of thyroid cancer developed cord compression and 27% suffered a pathologic fracture [7].

Although cord compression is a rare condition in patients with thyroid cancer, poor clinical outcome have been reported in these patients [7] [11] [13]. So early diagnosis and appropriate treatment strategy can prevent morbidity and mortality of patients with thyroid cancer and bone metastasis [9]. Proper diag-

nosis is an important point in cervical spinal cord myelopathy. In the present study, clinical presentation of the patient and imaging studies embraced that vertebral metastatic lesion is the most probable cause of cervical myelopathy. Subsequently the diagnosis was confirmed by pathologic assessment. Cervical lymph node ultrasound is a modality that can be helpful in diagnosis of metastatic lesion. Leboulleux *et al.* indicated that cystic appearance, hyperechoic punctuations, loss of hilum and peripheral vascularization of lymph nodes are major ultrasound criteria for involvement of cervical lymphatic system by malignant thyroid cells and therefore can be useful in the diagnosis of metastasis of thyroid cancer [14].

Cervical myelopathy due to metastatic thyroid cancer is a critical disease which can cause severe neurologic impairments as we observed in the case of the present study. Management of disease in patients with spinal metastasis requires a multidisciplinary approach which integrates surgery, radiotherapy, medical oncology, interventional radiology, and physiotherapy. Neurologic, oncologic, mechanical, and systemic (NOMS) decision framework enables health care providers to choose the most appropriate treatment strategy in the care of patients with spinal metastases [15]. As reported in the method section of the present study, we faced a low compliance patient who presented with symptoms of myelopathy and had discontinued his iodine therapy for several months. After spinal surgery, he restarted his chemotherapy sessions again. This comprehensive treatment strategy including surgical intervention, oncologic management, and rehabilitation program resulted in resolution of all symptoms of myelopathy and a satisfied patient after twelve month of follow up.

4. Conclusion

Cervical myelopathy due to metastasis is a rare condition and only few cases have been reported so far. In this study, we reported a 36-year-old male with previous diagnosis of FTC without proper adherence to his medical therapy. He presented with severe pain in cervical spine, gait disturbances and impairment in sensory and motor function of upper left extremity. Early diagnosis and multidisciplinary treatment approach to the patient led to satisfactory results. So we recommend health professionals to be aware that myelopathy may be a complication of metastatic thyroid cancer and requires comprehensive treatment strategy.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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