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Case Report Open Access

# Spinal Cord Compression as Initial Presentation of Follicular Thyroid Carcinoma Thyroid

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**Abstract**

Spinal cord compression due to metastases of follicular thyroid cancer usually occurs as a late complication. We report two cases of metastatic follicular thyroid cancer who presented with spinal cord compression as initial presentation. In both the cases histopathologic diagnosis was made on core biopsy of the spinal lesions. These cases highlight the importance of a thorough preoperative work up for metastatic spine tumours. This should include evaluation of the thyroid consisting of thorough clinical history and examination. We summarize the clinical characteristics of these cases, the therapeutic measures used and their outcome.

**Keywords:** Follicular thyroid cancer; Spinal cord compression; Vertebral metastases; radiculopathy; Total thyroidectomy

## Introduction

The most common sites of metastases from follicular thyroid carcinoma are lungs and bone. In a small number of patients, bone metastases may be the first sign of disease [1]. Spinal cord compression due to metastatic follicular thyroid cancer is uncommon and occurs mainly in the later stage of the disease [2]. Spinal cord compression as the initial presentation of a follicular thyroid cancer, without there being any other symptoms of malignancy is rare [3]. We present two cases of metastatic follicular thyroid cancer, who first presented with symptoms of cord compression without any symptom related to the primary thyroid cancer. We stress on the need for appropriate evaluation of thyroid for a diagnosed case of spinal metastases of unknown origin.

## Case 1

A 58-year-old male presented to our clinic with a six month history of low back pain radiating to both lower limbs. He also experienced numbness and progressive weakness of both lower extremities more on the right side. The pain was exacerbated by standing or walking and improved with sitting. His medical history was otherwise unremarkable. Magnetic resonance imaging (MRI) of spine showed mass lesion 53 × 44 mm in the right posterior body and right pedicle of L2 vertebra. L2 vertebral body appeared iso intense on T1 and hyperintense on T2 weighted images (Figure 1). It also showed marked extradural pressure effects over anterior thecal space and right sided nerve roots at neural foramen. A computerized tomography (CT) guided core biopsy of the lesion was performed and histopathologic examination revealed a metastatic follicular carcinoma originating from the thyroid gland. This histopathologic diagnosis made us to investigate for the thyroid gland and neck palpation revealed a firm solitary nodule right lobe of the thyroid. USG evaluation of the neck showed right thyroid nodule 3.5 × 3 cms without any abnormal associated lymphadenopathy. USG guided FNAC was performed which showed atypical follicular cells, suggestive of follicular neoplasm. Bone scan did not show any other bony metastases except the lumbar region. Computerised tomography scan Abdomen and chest were normal without any metastatic lesions. Laboratory results including complete blood cell counts, erythrocyte sedimentation rate, C-reactive protein, etc. were within normal ranges. Tumor marker studies including carcino embryonic antigen, CA 19-9, Alpha fetoprotein, prostate specific antigen, neuron specific enolase, calcitonin, etc. were all within normal ranges.

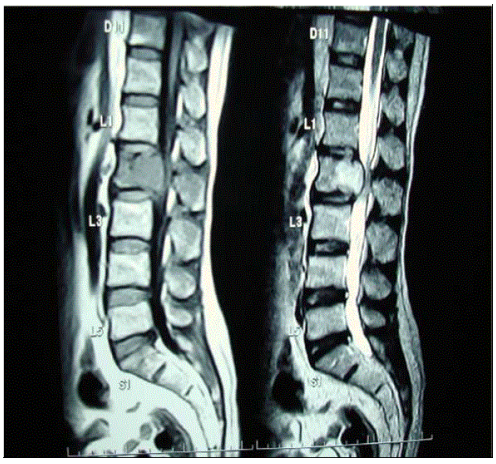


**Figure 1:** Contrast- enhanced sagittal Magnetic resonance imaging of spine (MRI) showing mass lesion 53 × 44 mm in the right posterior body and right pedicle of L2 vertebra isointense onT1 weighted image (R) and hyperintense on T2 weighted image (L). Significant compression of the spinal canal is evident on the MRI.

Since this was the only metastatic lesion apparent at the time of work up, so complete resection of the L2 vertebral body with an iliac bone allograft insertion was done. The L1- L3 spine was stabilized by spinal implants. Histological examination revealed a metastatic thyroid carcinoma with a predominantly follicular pattern. The patient then underwent total thyroidectomy and I 131 radioablation after 5

weeks after surgery. Gross examination of the specimen revealed a dominant large nodule 3.2 × 3 × 2.2 cms encapsulated with breach of capsule. Histopathological examination of the surgical specimen was reported as follicular thyroid carcinoma. Post operative period was uneventful and I 131 whole body scan at the end of the 5th week showed no residual thyroid tissue in the thyroid bed (neck), and ablative dose of 150 mci was given. He also received local port of radiotherapy for the spinal area. Patient has been put on thyroxin 150 microgram/day for life and kept under close follow up. Three years postoperatively, he is asymptomatic and in remission.

## Case 2

A 50-year-old male presented to our clinic with a 2-month history of pain in the neck with radiation to lateral forearm .He also experienced fatigue in the left arm on exertion. There were no other neurologic symptoms. On MRI spine a lobulated soft tissue mass hypointense on T1-weighted and hyperintense on T2-weighted images was noted causing destruction of the T2 vertebral body and lower portion of the T1 also.

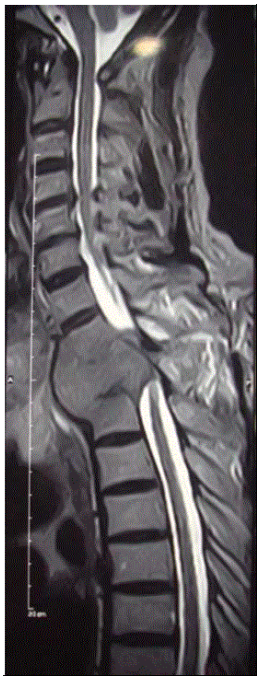

**Figure 2:** Sagittal T2 weighted Magnetic resonance image shows destruction of the T2 vertebral body with extradural cord compression by a mass behind T2 vertebral body.

The intraspinal portion of the mass was deemed to be causing extradural spinal cord compression at the level of T2 (Figure 2). Incidentally Magnetic resonance imaging of the spine showed a well-circumscribed mass in left lobe of the thyroid (Figure 3). Fine needle aspiration biopsy of the thyroid disclosed suspicious follicular carcinoma of the thyroid. 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, Alpha fetoprotein, prostate specific antigen, neuron specific enolase, calcitonin, etc. were all within normal ranges. Also, he showed a progressive weakness of left arm (grade III). Metastatic tumour was resected via anterior approach after sternotomy (Figure 4). There was no intradural invasion. At the same time total thyroidectomy was performed. Histopathological study confirmed metastatic follicular carcinoma of the thyroid. He received I131 ablation after five weeks of surgery. He also received local port of external beam radiation therapy as part of his treatment. Two years after surgery he develop huge recurrence involving the chest wall and extending into the thoracic cavity, not amenable to curative resection. He died of advanced nature of cancer recurrence after one year of treatment.

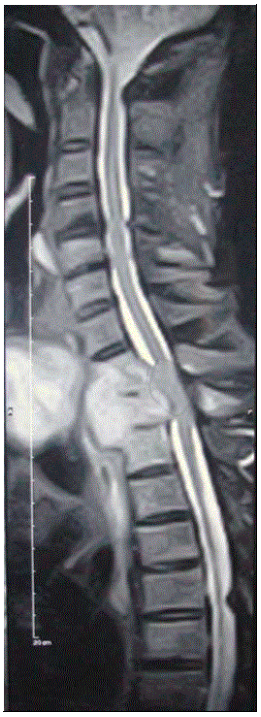

**Figure 3:** Contrast- Sagittal T2 weighted MRI image also shows well enhancing mass in the left lobe of the thyroid.

## Discussion

Follicular thyroid carcinoma usually metastasizes through the hematogenous route to the bone, lung, and central nervous system [4]. Follicular thyroid carcinomas are known to produce distant metastases without symptoms from a primary thyroid lesion [5]. Spinal cord compression as initial manifestation from follicular carcinoma is an extremely rare event. Review of English language literature reveals only few sporadic cases of spinal cord compression presenting as the initial manifestation of follicular thyroid carcinoma [2] Because of this rare clinical presentation, it may be diagnostic challenge to clinicians as well as the radiologists [6]. Routine physical examination and laboratory findings for spinal metastatic disease of an unknown origin are unlikely to raise a suspicion for an occult thyroid cancer. Therefore, routine work-up of the thyroid with CT or MR imaging in metastatic spinal tumors are not usually recommended. 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. If a mass is palpated within the thyroid, fine needle

aspiration is indicated to arrive at the diagnosis. The difficulty is evident from both of our cases as their initial presentation was due to the metastatic disease. Hence the primary care physicians had advised MRI spine as the initial investigation. In the first case core biopsy from the spinal lesion made the diagnosis of metastatic follicular carcinoma while in the second case the MRI scan incidentally picked up the synchronous lesion in the thyroid gland.

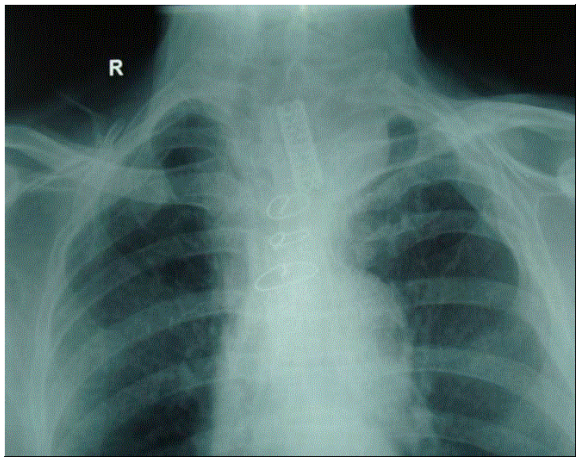


**Figure 4**: Post operative Chest X ray depicting the instrumentation used for fixing the spine (Tumour was resected via anterior approach after sternotomy).

Early recognition of the primary source of metastatic spinal disease is important because functional outcome depends on neurologic condition at the time of presentation. Therapeutic intervention should be done as early as possible after diagnosis to alleviate pain, preserve or improve neurologic function, achieve mechanical stability, optimize primary and metastatic site tumor control and hence improve quality of life. There are no definitive guidelines for management of the spinal metastases in well differentiated thyroid cancer as much of the literature on spinal metastasis in thyroid cancer is based on small case series. Surgical intervention at the metastatic site is indicated for patients with intractable pain, cord compression, neurological deficit or cervical instability [7]. Metastatic disease causing instability should be treated prefentially with anterior reconstruction and stabilization like in cervical spine [8]. Demura et al. are of the view that total en bloc spondylectomy (TES) provides better local control of thyroid cancer spinal metastasis, compared with debulking surgery only [9]. Not only did the risk of local recurrence decrease significantly (risk of recurrence 57%, c.f. 10% with TES) as compared to debulking only, but it was also associated with increased survival [9]. Stojadinovic et al. recommended surgery as the preferred method for resectable, locoregional recurrence, followed by radioactive iodine (RAI) therapy for iodide-concentrating thyroid cancer, or external-beam radiation for tumors that lack RAI avidity [10]. Patients who underwent complete metastasectomy had significantly improved survival than those having palliative resection (5-year DSS, 70% vs. 30%, P value = 0.004) [10]. Proye et al. demonstrated that differentiated thyroid cancer is usually less life threatening, and that early diagnosis and appropriate treatment for distant metastases can significantly prolong the life span and improve quality of life [11]. Therefore, it is important to treat the metastatic disease completely for better survival as indicated by the above mentioned studies. However, this may not always be possible as complete resection cannot be achieved without high morbidity. Shaha et al. also reported that total thyroidectomy followed by RAI therapy and thyroxine suppressive treatment extended long-term survival (10-15 years) in 44% of patients with metastatic follicular thyroid carcinoma [12].

Post-surgical adjuvant $^{131}I$ ablation also has been shown to be main form of adjuvant treatment for metastatic deposits of differentiated thyroid carcinoma. Radioiodine absorption is also a prognostic factor in such a situation [13]. Radioiodine ablation reduces the pain rating on a 4 point analogue scale, irrespective of whether selective embolization therapy was combined, in a number of patients with spinal metastasis [14]. We are in complete agreement with Hindie et al. as they recommend that young patients who have $I^{131}$ avid metastasis of well differentiated thyroid carcinoma , should be treated aggressively and also revieve $^{131}I$. Radioiodine therapy, however is not without adverse effects if treatment exceeding 600 mCi is used as it may may be deleterious to the health. In patients with non $^{131}I$ avid disease, or who are not showing any response to $^{131}I$, other treatment modalities should be considered and discussed in detail. Treatment modalities like selective emboliation therapy (SET), small molecule inhibitors like vascular endothelial growth factor inhibitors, bisphosphonates and radiotherapy may be used on case to case basis. Symptomatic relief and progression arrest can be achieved by combination of these mentioned modalities.

In conclusion aggressive treatment especially in young is indicated to control the primary and the metastatic disease. Surgery and radioiodine treatment is the best combined modality for the initial management. Radiotherapy, SET, bisphosphonates and small molecule inhibitors may be used for symptomatic relief and palliation.

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