

Anaesthetic Management of Total Thyroidectomy in a Patient with Spinal Cord Compression due to Metastatic Follicular Thyroid Carcinoma

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Vascular invasion is characteristic for follicular carcinoma of the thyroid and distant metastasis is common. Spinal cord compression due to metastases of differentiated thyroid carcinoma as the initial presentation is an extremely rare condition. We report a case of asymptomatic metastatic thyroid cancer which presented with spinal cord compression. This patient with metastasized follicular carcinoma of the thyroid to the spinal cord and narrowing of the airway posed many challenges to the anesthetist.

Keywords: thyroidectomy, anaesthesia, cord compression, thyroid carcinoma

Introduction

Follicular cancer is one of the few cancers of the head and neck region which has an excellent prognosis with higher survival rates. But the survival rates will reduce by 50% in metastatic disease. The 10-year survival will further reduce if bone metastases are present.

Case presentation

A 56-year-old bed bound patient with a large goiter in the neck diagnosed as follicular cancer of thyroid was admitted for total thyroidectomy. The patient initially presented to a neurologist after being bed bound for eight months with lower limb weakness of gradual onset. Clinical examination revealed a long-standing asymptomatic goiter and the primary lesion was suspected to be in the thyroid gland. By this time, she had developed near complete lower limb paralysis without bowel and bladder involvement. She did not have any symptoms suggestive of hyperthyroidism or hypothyroidism. There were no features suggestive of autonomic dysreflexia like

headache, flushing, sweating, nasal congestion. She was allergic to paracetamol. There was a family history of goiters among first cousins.

On examination, the right side of the thyroid gland was significantly larger than the left lobe. On neurological examination there was significant wasting of the lower limbs. There were contractures and involuntary spasms. Tone was increased and the power was 2/5. Lower limb reflexes were exaggerated. Babinski sign was positive. Respiratory muscles were not affected. On airway assessment, there were no signs of sleep apnoea. The Mallampati grading was two and thyromental distance was 3 finger breaths. Delikan's sign was positive. CT findings relevant to airway showed 2 heterogeneously enhancing masses in the right lobe of the thyroid with foci of calcifications which caused severe compression and significant narrowing of the trachea. The minimum tracheal diameter was 6.3 mm. She was biochemically euthyroid.

MRI showed metastatic bone disease involving T1, T2, L1, and upper sacral elements. Thoracic spinal cord, cauda equina and conus medullaris were compressed. Ultrasound (US) scan of the neck showed a 3.4cm x 4.3cm size hyperechoic lesion in the right lobe without cervical lymphadenopathy. US guided fine needle aspiration showed highly vascular lesion (Bethesda 3). MRI guided TRUCUT® biopsy of the spinal lesion showed metastatic deposit of follicular cancer. CECT suggested an appearance of the thyroid nodules likely representing locally

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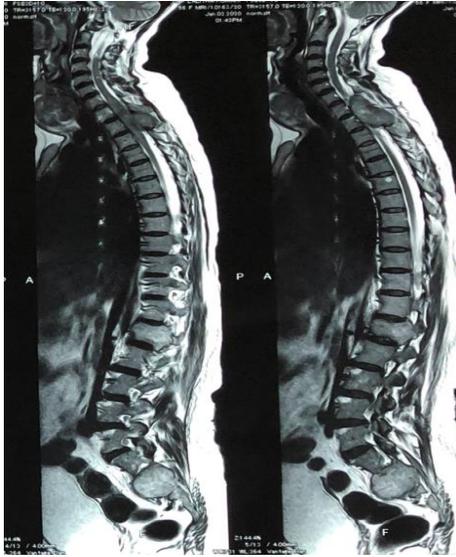
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Figure 1: MRI -metastatic bone disease involving T1, T2, L1, upper sacral elements. Thoracic spinal cord, cauda equina and conus medullaris are compressed.



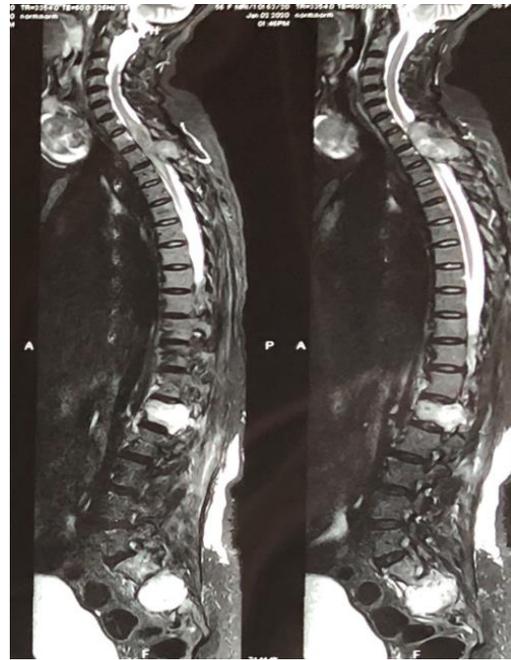
advanced follicular carcinoma with multiple bone metastasis and thoracic spinal cord compression at the level of T1.

Informed written consent was taken from the patient. Perioperative anaesthetic management, possible surgical and anaesthetic complications were discussed with the surgical team. An ICU bed was booked for postoperative care.

Positioning on the operating table was done carefully to avoid further damage to the spinal cord. She had muscle spasms which complicated positioning. Difficult intubation was anticipated. We had a clear plan for intubation according to difficult airway society guidelines. Patient was induced with sevoflurane and gently ventilated to check for the ability to ventilate. Then suxamethonium was given. Intubation was done using a video laryngoscope. Surgery lasted for one and half hours and it was uneventful. The patient was transported to the ICU with a plan to extubate the next day. Extubation was done on the following day using Cook airway exchange device. Early feeds and early physiotherapy were initiated. She was started on oral thyroxine 125 µg mane and was sent to the ward on the second postoperative day. She was referred to the National Cancer Institute, Maharagama for chemoradiation.

After one month, patient was contacted. She had a marked improvement of her neurological condition. She could feel touch and pain in the lower limbs and motor weakness has also improved. She could mobilize with help and was undergoing physiotherapy.

Figure 2: CT -Thoracic spinal cord compression at the level of T1



Discussion

Follicular thyroid cancer (FTC) accounts for 15% of all differentiated thyroid carcinomas. Distant haematogenous metastases to the bone, lung and central nervous system occur as a common complication of follicular thyroid carcinoma. Bone is one of the common sites of metastasis 7–20%, out of which 60–80% is thoracic, 15–30% lumbar and <10% cervical^{2, 3}. Prevalence of spinal metastasis is highest among individuals between the 4th and 7th decade of life⁴. However, spinal cord compression as initial manifestation is extremely rare.⁵ Primary thyroid lesion may be asymptomatic, posing challenges to the clinician. American Thyroid Association (ATA) guidelines recommends surgical resection and stereotactic external beam radiation therapy (EBRT) for central nervous system (CNS) metastases and radioiodine (RAI) therapy and concomitant

glucocorticoid therapy if CNS metastases concentrate RAI.⁶ Research shows increased survival with ¹³¹I avidity and complete bone metastasis resection. Early detection and treatment therefore are crucial. Studies suggest in those patients below the age of 45 years that treatment should be aggressive and aim for cure. In those patients in whom curative treatment is not an option, palliative treatments are available.⁷ In most cases the treatment of thyroid carcinomas results in long-term remission. Survival is excellent in younger patients and recurrence is more likely at extremes of age.⁸ Poor outcomes can be expected in patients with metastasis and advanced disease at diagnosis. The usual presenting complaints are localised back pain and radicular pain due to nerve root compression. MRI is the gold standard to diagnose metastatic lesions in the spinal cord. Chronic spinal cord compression can lead to dreadful risk for autonomic dysreflexia. It is characterized by a massive disordered autonomic response to certain stimuli below the level of the lesion, such as bladder and bowel distension. Severe hypertension can lead to raised intracranial pressure resulting in seizures and intracranial haemorrhage and cardiac complications including myocardial ischaemia, arrhythmias, and pulmonary oedema.⁹ Our patient did not develop autonomic dysreflexia. Large, long-standing goiters can compress the trachea and lead to difficult intubation. Although our patient had narrowing of the trachea with a diameter of 6.3 mm, intubation did not pose any difficulties. We adhered to Difficult Airway Society Extubation guidelines. It was done in the ICU after checking for air leak and using the Cook's airway exchanger.

Conclusion

Spinal cord compression as an initial presentation is extremely rare in follicular thyroid carcinoma. These patients pose challenges to the clinician and thorough clinical evaluation is necessary to identify the primary cause and plan rational management. The anaesthetic management is complicated by the presence of airway compromise, difficulty in positioning and the

possibility of life-threatening autonomic hyperreflexia.

Reference

1. H. Hakeem, "Spinal Cord compression as Initial Presentation of Follicular Thyroid Carcinoma" *Journal of Thyroid Disorders & Therapy* 2014;**3**:3 doi:[10.4172/2167-7948.1000166](https://doi.org/10.4172/2167-7948.1000166)
2. Jason A. Wexler. Approach to Thyroid Cancer Patient with Bone Metastases, *The Journal of Clinical Endocrinology & Metabolism*, August 2011, **96**(8), 1, Pages 2296-2307. <https://doi.org/10.1210/jc.2010-1996>
3. Ramadan, S., Ugas, M.A., Berwick, R.J. *et al.* Spinal metastasis in thyroid cancer. *Head Neck Oncol*, 2012,**4**(39) <https://doi.org/10.1186/1758-3284-4-39>
4. Harel R. Angelov L. Spine metastasis: current treatments and future directions. *European journal of cancer* 2010;**46** :2696-2707 <https://doi.org/10.1016/j.ejca.2010.04.025>
5. Khan, Md Nuruzzaman *et al.* "Spinal cord compression as initial presentation of metastatic occult follicular thyroid carcinoma." *Journal of neurosciences in rural practice* 2014, **5**(2): 155-9. doi:10.4103/0976-3147.131661
6. Bryan R Haugen, Erik K Alexander *et al* "2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer": *The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer*; 2016 Jan;**26**(1):1-133 DOI: [10.1089/thy.2015.0020](https://doi.org/10.1089/thy.2015.0020)
7. Ramadan, S., Ugas, M.A., Berwick, R.J. *et al.* "Spinal metastasis in thyroid cancer". *Head Neck Oncol* 2012, **4** (39). <https://doi.org/10.1186/1758-3284-4-39>
8. Ernest L. Mazzaferri, Richard T. Kloos, Current Approaches to Primary Therapy for Papillary and Follicular Thyroid Cancer, *The Journal of Clinical Endocrinology & Metabolism*, April 2001, **86**(4), 1, Pages 1447–1463. <https://doi.org/10.1210/jcem.86.4.7407>
9. Petsas, A. and J. Drake. "Perioperative management for patients with a chronic spinal cord injury." *BJA Education*, 2015, **15**: 123-130. <https://doi.org/10.1093/bjaceaccp/mku024>