International Journal of Surgery Case Reports 109 (2023) 108541

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

Unveiling follicular thyroid carcinoma by solitary spinal metastasis causing severe neurological deficit in a 67-year-old female: A case report

Yumna Njoum [a,*], Lila H. Abu-Hilal [a], Duha Barghouthi [a,*], Khaled Alshawwa [b], Tawfiq AbuKeshek [c], Mohammed Maree [b]

[a] Faculty of Medicine, Al-Quds University, Jerusalem, Palestine
[b] Department of Surgery, Al-Makassed Hospital, Jerusalem, Palestine
[c] Department of Radiology, Al-Makassed Hospital, Jerusalem, Palestine

ARTICLE INFO

Keywords:
Follicular thyroid carcinoma
Metastasis
Spinal lesion
Malignancy
Thyroid cancer

ABSTRACT

Introduction and importance: Follicular thyroid carcinoma (FTC) exhibits the ability to metastasize hematogenously to distant organs. Spinal metastasis is an unusual site for metastasis that even when it does, spinal metastasis manifests late in the course of the disease and is frequently linked to advanced disease and a bad prognosis. Until 2019, the literature only showed 29 cases of FTC with spinal metastasis as the first presenting feature.

Case presentation: We present a case of a 67-year-old female who presented with an acute onset of severe neurological deficit that ended up bedridden. Magnetic resonance imaging of the spine revealed a spinal lesion causing severe spinal cord compression. Urgent surgical decompression was performed, and the histopathology confirmed metastatic FTC. Subsequent comprehensive evaluation, unveiled a primary thyroid tumor.

Clinical discussion: FTC accounts for 1 % of all malignancies, Therefore, regardless of how irrelevant symptoms may appear at first, it is important to understand all risk factors, screening recommendations, diagnostic techniques, treatment, and the vast range of potential presenting symptoms. Just like our patient, who had incontinence and abrupt loss of motor and sensory function in her lower limbs to be diagnosed with spinal cord compression by metastatic FTC.

Conclusion: This instance emphasizes how crucial it is to consider FTC as a possible differential diagnosis in cases with spinal metastasis, even when there is no known primary thyroid cancer. Prompt diagnosis, comprehensive staging, and multidisciplinary management are crucial in optimizing outcomes.

1. Introduction

Thyroid cancer ranks among the top-ten most prevalent cancers globally and stands the most frequent endocrine malignancy which poses the possibility of arising of very distinctive, wide range of0020presentations. However, local thyroid nodules remain the most common classic presentation. Its incidence is particularly notable in females aged 45–54 years [1].

The majority are classified as differentiated thyroid cancer, including papillary and follicular cancer, which together account for more than 85 % of cases, with papillary thyroid cancer (PTC) being the most prevalent accounting for 70–75 % of cases and FTC causing 15–20 % of cases [1,2].

While distant metastasis is a reported characteristic of FTC, cord compression from spinal involvement is a rare feature, furthermore, most of the spinal metastases occur in the late stage of the disease, and presentation of the disease with spinal metastasis is extremely rare during initial diagnosis, and especially if the urgent, disabling sequelae of the spinal metastasis was the presenting symptom.

2. Case presentation

A 67-year-old female with insignificant past history was admitted complaining of a one-month history of mid-back pain that was continuous, progressive, and increased at night, which gradually developed to significant paresthesia, numbness of the trunk and lower limbs from nipples and below that progressed to develop lower limbs weakness leading her to ambulate by the assistance of a walker before she became bedridden and resultant incontinence. Physical examination showed a

* Corresponding author at: Ramallah, Palestine.
E-mail address: Duhabarghouthi@gmail.com (D. Barghouthi).

https://doi.org/10.1016/j.ijscr.2023.108541
Received 20 June 2023; Received in revised form 6 July 2023; Accepted 15 July 2023
Available online 21 July 2023

bedridden conscious oriented and alert patient, her Glasgow coma scale was 15/15, pupils were equal, round, and reactive to light and accommodation. Grossly intact cranial nerves, upper limbs showed power + 4/5 and positive Hoffman sign on the right upper limb with intact sensation. She had paresthesia on the distribution of the D4 dermatome below the nipple, and her lower limbs examination showed severe spastic paraparesis, hyperreflexia, and positive Babinski's sign bilaterally. Radiological examination via computerized tomography (CT) shows a large soft tissue lesion eroding the left lower endplate of the D3 vertebral body with extension to the spinal canal and left neural foramina resulting in canal stenosis. Also, extension to the lower disc space (i.e. D3-D4 disc) resulting in relative widening of disc space (Fig. 1).

MRI shows a large soft tissue lesion centered on the left lower endplate of the D3 vertebra with hypointense signal intensity on T1 WI and heterogeneous signal predominately hyperintense on T2WI with intense post-contrast enhancement. The lesion extension to spinal canal resulting in severe canal stenosis and extrinsic spinal cord compression without definite evidence of myelomalacia, and the lesion extension of the left neural foramina resulted in severe foraminal stenosis (Figs. 2 and 3).

Due to the urgent presentation of severe spinal cord compression and complete lower limb paralysis, the surgical approach was unequivocally prioritized over alternative modalities, such as selective embolization therapy, given the significantly limited availability of treatment options within the hospital, she underwent D2-D3 laminectomy with decompression of the spinal cord, D3 transpedicular tumor debulking with D1.2-D4.6 transpedicular fixation under neuromonitoring with no immediate complications, Post-operatively, the patient had dramatic improvement of her disability, regained her ability to walk with assistance, and improved spastic paraparesis and complete resolution of her radicular pain.

A cervicodorsal CT scan without contrast was done postoperatively that showed gross total resection of the tumor with optimal instrumentation, on day five postoperatively, a cervicodorsal MRI was done and showed postoperative changes with an increase in kyphotic angle.

Pathological examination of the resected tumor showed a strongly positive TTF-1 stain on immunohistochemistry, positive pan-cytokeratin, and negative chromogranin highly suggestive of metastatic carcinoma, thyroid in origin, follicular in type (Figs. 4, 5).

The patient then denied any history of dysphagia, dyspnea, hoarseness of voice, weight loss, or loss of appetite, she also denied symptoms of hyper or hypo-functioning thyroid. Examination of the neck did not reveal any palpable thyroid nodules or masses, neither were any palpable cervical lymph nodes and her thyroid stimulating hormone levels were within normal range. Leading the patient towards thyroid ultrasound which revealed a well-defined hypoechoic nodule that shows internal foci of microcalcifications measuring 8 × 6 mm seen in the lower portion of the right thyroid lobe classified as TI-RADS 5 according to Thyroid Imaging Reporting & Data System.

Ultrasound-guided fine needle aspiration showed FTC. Staging CT of the body did not show locally advanced disease, adjacent structure invasion or further metastatic lesions. She received multiple spine radiotherapy cycles and underwent total thyroidectomy with no immediate or early complications, pathology specimen of the resected thyroid gland confirmed the aforementioned pathology reports with the diagnosis of FTC with a strongly positive TTF-1 stain and the remainder of the thyroid gland showing goitrous changes.

Neurosurgical follow-up one month postoperatively showed improved spasticity in the lower limbs, improved sensation, positive Babinski's bilaterally and positive Hoffman on the right side, and +2 bilateral lower limb hyperreflexia and the patient now walks with assistance. MRI Imaging showed a tumor resection cavity with good instrumentation of the screws with no increase in kyphosis. Surgical follow-up 2 weeks post-thyroidectomy showed a well-healed scar, normal complete blood count ranges, and calcium levels. The patient was then referred for regular oncologic follow-up for tumor recurrence and received one session of radioactive iodine with a good response.

3. Discussion

Thyroid cancer constitutes approximately 1 % of all new malignant diseases, which gives it high importance of understanding all the possible wide variety of presenting complaints exactly as our patient who presented with acute severe loss of motor and sensory function of his lower limbs and incontinence [4,5].

FTC is associated with a worse prognosis than PTC [2] and tends to metastasize distantly in only 7 % of patients due to its hematogenous spread, primarily affecting organs such as the bones and lungs. Early detection is essential for survival as distant metastasis of FTC has a considerable impact on patient survival, making it a critical prognostic factor [2,3].

Despite its rarity, only 29 cases of FTC's initial manifestation have been reported presenting with spinal metastasis until 2019 [6]. Interestingly, only 1 % of patients with FTC present with distant metastasis as

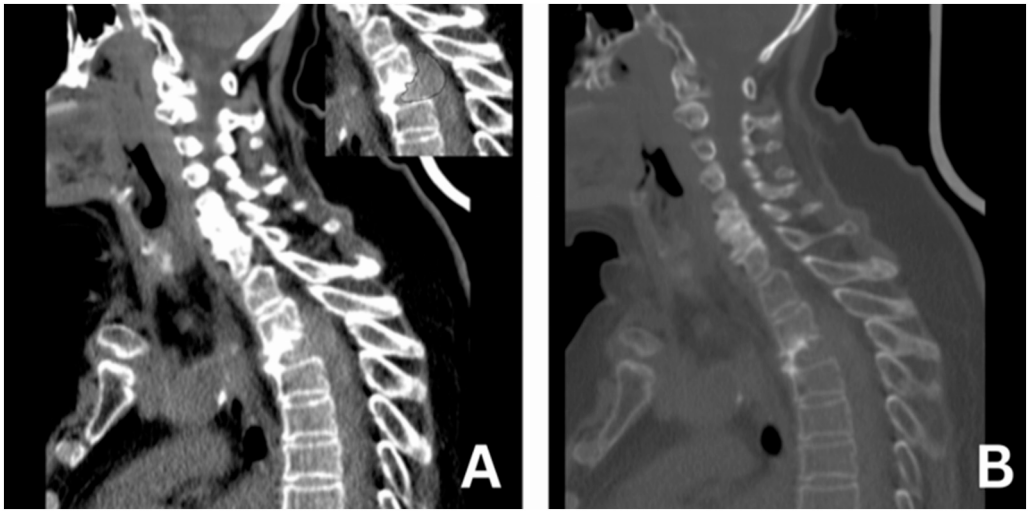

Fig. 1. Cervico-dorsal spine CT Image of sagittal reformat soft tissue window (A) shows soft tissue lesion eroding the left lower endplate of D3 vertebra with spinal canal extension (magnified and delineated in the left upper corner of the image), Image of sagittal reformat bone tissue window (B) better attest the relative widening of disc space below in comparison with other levels.

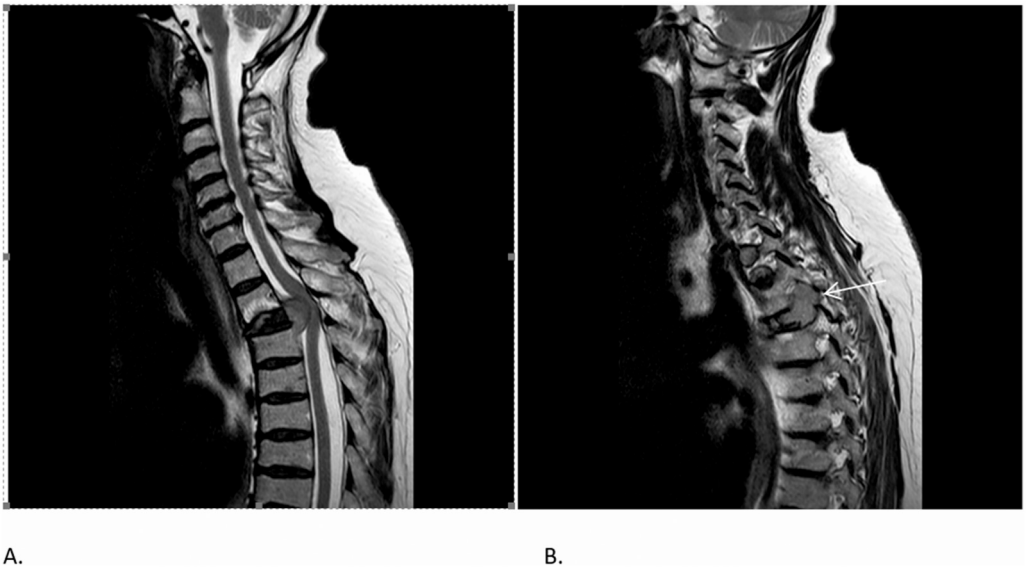

Fig. 2. Cervico-dorsal spine MRI T2 (WI) sagittal plane midline (A) and to the left foraminal level (B) shows the soft tissue extradural extramedullary lesion at D3-D4 disc level causing severe extrinsic compression over spinal canal which is pushed posteriorly, at left foraminal level (B) the lesion (white arrow) extension resulting in severe foraminal stenosis with the extension to disc space also appreciated.

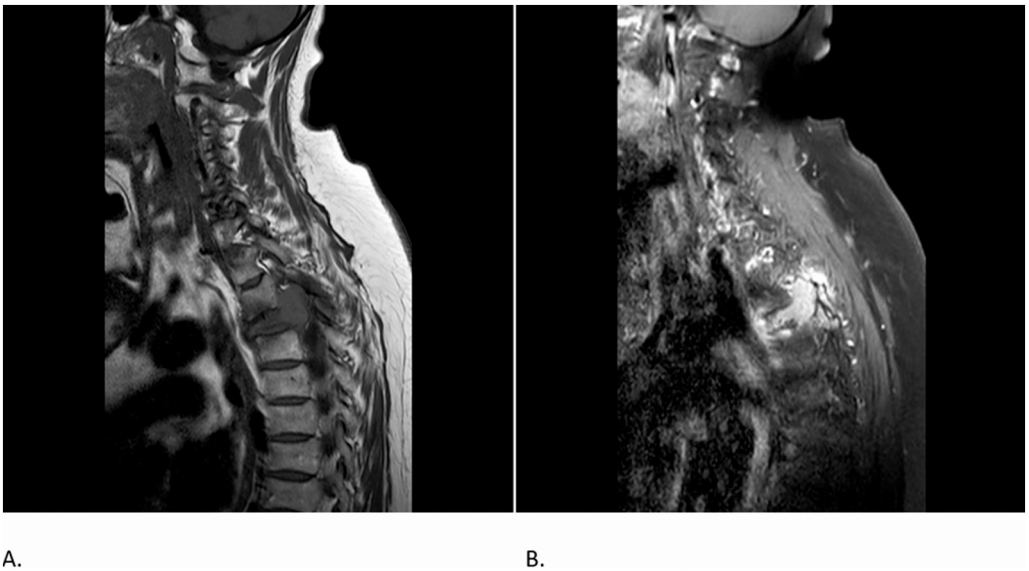

Fig. 3. Cervico-dorsal spine MRI T1 (WI) pre (A) and post contrast administration (B) shows the intense enhancement of the lesion.

their initial manifestation, especially in elderly people in which age has been identified as a significant risk factor for distant metastasis of FTC [2], which can occur even after initial management as recurrence [2,5].

The 10-year survival rate being 80–95 % in DTC without metastasis. When distant metastasis occurs, it dramatically drops to about 40 % [5]. Tumor type and stage at the time of diagnosis tell a lot about the prognosis and treatment approach. Management necessitates a multidisciplinary approach, given the absence of a definitive treatment protocol. Several studies have explored different treatment modalities, ranging from established methods to potential novel alternatives [5]. It is crucial to identify people with unusual presentations as neurological dysfunction and pathological fractures even in the absence of thyroid-related symptoms due to the poor survival outcomes of patients with metastatic FTC. The presenting clinical features and neurological symptoms observed in this case are striking and symptomatology progressed rapidly, the patient's functional decline, necessitating the use of a walker and subsequent bedridden state with incontinence, further emphasizes the severity and impact of spinal metastasis in FTC [5].

Challenges in diagnosis observed via the need for further multidisciplinary diagnostic approaches of the underlying malignancy after pathological evidence of metastatic FTC without a previously diagnosed source or clinical evidence of primary thyroid lesion, which included pathological examination of the resected tumor, Ultrasound evaluation, and further confirmatory fine needle aspiration, the impact on patient outcomes, and the importance of multidisciplinary approaches witnessed by the multimodal approach to treatment, including neurosurgical management of the unstable spine, chemoradiotherapy, thyroidectomy, and radioactive iodine. This makes this case a contribution to the existing literature and provides valuable information for clinicians involved in the care of patients with metastatic thyroid cancer.

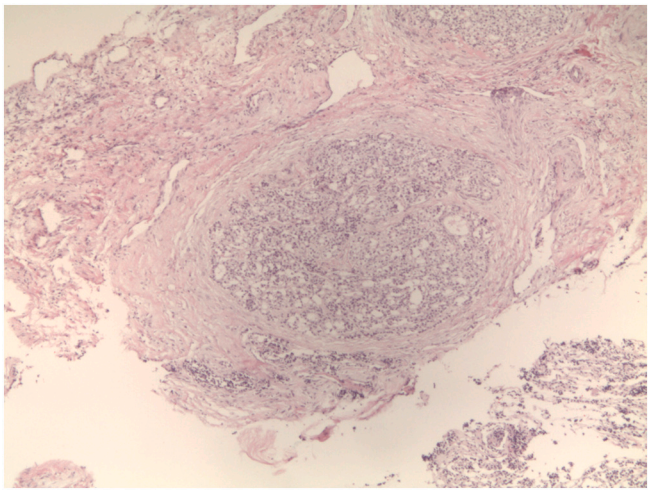

Fig. 4. H&E 5×: Soft tissue involved by metastatic follicular thyroid carcinoma.

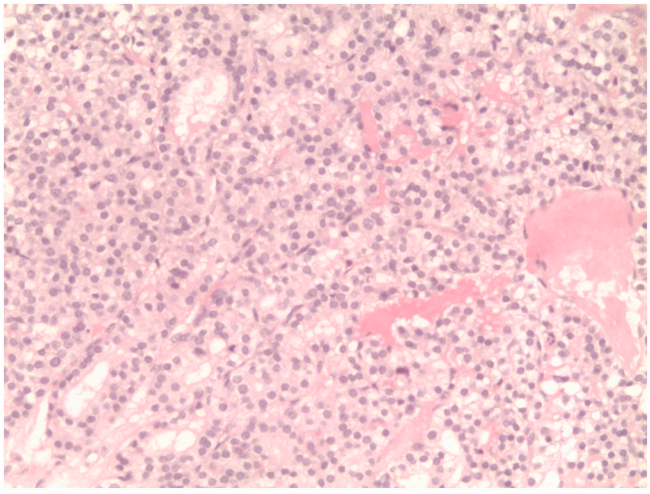

Fig. 5. H&E 20×: Tumor composed of variable-sized follicles. No nuclear features of PTC were seen.

4. Conclusion

Our case demonstrates the rarity of spinal metastases from follicular thyroid carcinoma and the extremely unexpected unique presentation of a patient who initially presented bedridden with severe paraparesis before being diagnosed with severe cord compression from metastatic follicular thyroid carcinoma. The difficulties in identifying and keeping track of patients at risk for distant metastases, the severe neurological symptoms brought on by spinal involvement, and the value of a multidisciplinary treatment strategy in cases of limited time window before permanent neurological damage which emphasizes the importance of early detection, multidisciplinary management, and timely intervention in cases of spinal metastasis from FTC.

Methods

The work has been reported in line with the SCARE criteria [7].

Consent for publication

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. Also, all authors read and approve the final manuscript.

Ethical approval

The study is exempt from ethical approval in our institution: Al-Makassed Hospital, Jerusalem, Palestine. As only written informed consent from the patient was required.

Funding

This case report received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Yumna Njoum + Khaled Alshawwa: Literature review and manuscript preparation.

Lila H. Abu-Hilal: Literature review and manuscript preparation.

Duha Barghouthi and Mohammed Maree: Manuscript review and editing.

Tawfiq AbuKeshek: Radiology description and figures + diagnosis part.

Patient consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Guarantor

Dr. Mohammad Maree, Email: mohammedmaree1983@gmail.com.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data availability

The original contributions presented in this study are included in this article/supplementary material, further inquiries can be directed to the corresponding authors.

Acknowledgments

We would like to express our sincere gratitude to the patient who participated in this case report and allowed us to share their medical information. We would also like to thank the healthcare staff who provided excellent care and support throughout the patient's treatment. Without their contributions, this report would not have been possible.

References

[1] Q.T. Nguyen, E.J. Lee, M.G. Huang, Y.I. Park, A. Khullar, R.A. Plodkowski, Diagnosis and treatment of patients with thyroid cancer, Am Health Drug Benefits. 8 (1) (2015) 30–40. Feb.

[2] M.H. Wu, Y.Y. Lee, Y.L. Lu, S.F. Lin, Risk factors and prognosis for metastatic follicular thyroid cancer, Front. Endocrinol. 13 (2022), 791826, https://doi.org/10.3389/fendo.2022.791826.

[3] T. Li, Z. Ma, C. Lu, Q. Zhou, Z. Feng, X. Wu, Y. Luo, D. Li, X. Cheng, X. Liu, Chest wall lymph node metastasis from follicular thyroid carcinoma: a rare case report, Diagn. Pathol. 14 (1) (2019) 130, https://doi.org/10.1186/s13000-019-0907-0.

[4] G. Toshkezi, M. Galgano, S. Libohova, S. Marawar, Isolated spinal metastasis with spinal cord compression leads to a diagnosis of a follicular thyroid carcinoma, Cureus 7 (10) (2015), e346, https://doi.org/10.7759/cureus.346.

[5] S. Ramadan, M.A. Ugas, R.J. Berwick, M. Notay, H. Cho, W. Jerjes, P.V. Giannoudis, Spinal metastasis in thyroid cancer, Head Neck Oncol. 4 (2012) 39, https://doi.org/10.1186/1758-3284-4-39.

[6] Tufan, Azmi, et al. 'Spinal Metastasis as Presenting Feature of Follicular Type Thyroid Carcinoma: A Case Report and Review of the Literature/Spinal Metastazla Belirti Veren Follikuler Tip Tiroid Karsinomu: Olgu Sunumu ve Literatur Taramas?" *Bagcilar Medical Bulletin*, vol. 4, no. 1, Mar. 2019, pp. 1+. Gale Academic OneFile, link.gale.com/apps/doc/A659742588/AONE?u=anon~6d0780b&sid=googleScholar&xid=20c82657. Accessed 22 May 2023.

[7] R.A. Agha, T. Franchi, C. Sohrab, G. Mathew, A. Kirwan, A. Thomas, et al., The SCARE 2020 guideline: updating consensus Surgical Case Report (SCARE) guidelines, Int. J. Surg. 84 (1) (2020) 226–230.