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CASE REPORT

Rare behavior of follicular variant of papillary thyroid cancer

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Key Clinical Message

Follicular variant of papillary thyroid cancer typically favors nodal spread. We report a case with hematogenous spread including multi-organ involvement and describe our staged management approach. This is the first case to report follicular variant of papillary thyroid cancer with simultaneous adrenal and renal involvement.

Keywords

Distant metastatic thyroid cancer, follicular variant, papillary thyroid cancer.

Introduction

Papillary thyroid cancer (PTC) is the most common type of cancer affecting the thyroid gland; accounting for over 70% of all thyroid cancer cases [1]. Variants of papillary thyroid cancer include follicular, papillary microcarcinoma, tall cell, oncocytic, and columnar cell variants [2], each with characteristic histological features. In follicular variant of PTC (FVPTC), cells are arranged in colloid-filled follicles, but their nuclei show the typical features of PTC including ground glass appearance, nuclear pseudo-inclusions, grooves, and microfilaments [3]. Clinically, this variant mimics PTC; in that, it more often follows a nodal spread [3]. Follicular carcinoma of the thyroid, on the other hand, favors the hematogenous route for metastasis [3]. We are reporting a case of follicular variant of PTC with several unique features including widespread metastasis with multiple visceral involvement. We also describe the staged management approach in this patient with follow-up.

Case History/Examination

A 60-year-old man presented to our clinic complaining of left-sided neck swelling for the past 4 years. At the time of initial presentation, the mass had not been changing in size nor did the patient experience any compressive symptoms. The patient denied any family history of thyroid disease. Furthermore, he did not report any history of exposure to ionizing radiation. On physical examination, a 5-cm swelling was palpable in the left side of the front of the neck, which moved with swallowing.

Investigations and treatment

Ultrasound neck showed a slightly prominent right thyroid lobe measuring 4 × 1.1 cm with no focal lesions (Fig. 1). A large mass was found in the left thyroid lobe measuring 5.8 × 4.9 cm in diameter with cystic component and a small adjacent nodule. There was mild increase in perinodular vascularity on color-flow Doppler analysis. It also showed the presence of bilateral multiple cervical benign-looking lymph nodes. The largest was in the right middle cervical region and was 1.38 × 0.2 cm in size. Ultrasound-guided fine needle aspiration cytology showed the follicular nature of this mass. The sample was highly cellular, suggestive of follicular neoplasm (Bethesda class IV), clusters of follicular cells showing mild-to-moderate nuclear atypia were arranged in sheets, trabecular and microfollicular manners with areas of scanty colloid.

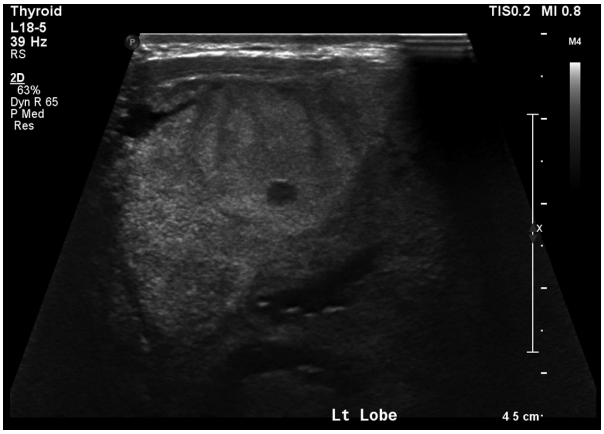

Figure 1. Ultrasound neck showing enlarged left thyroid lobe.

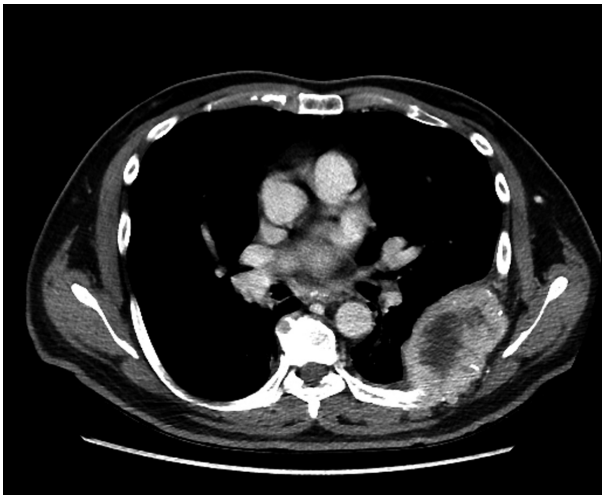

Figure 2. CT scan showing the metastatic chest wall lesion.

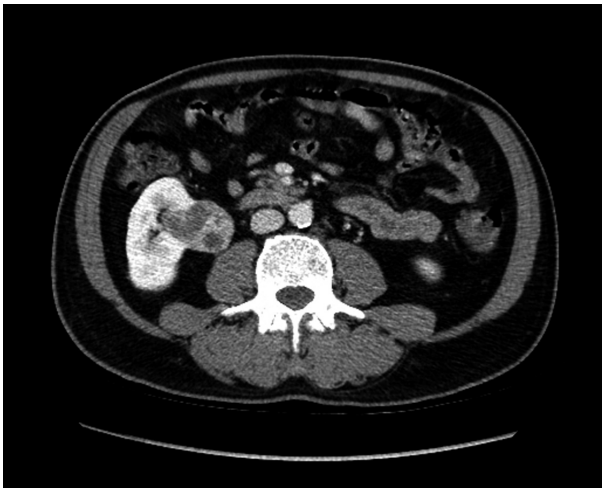

Figure 3. CT scan showing the metastatic lesion involving the right kidney.

Computed tomography (CT) scan of neck and chest (Fig. 2) showed a large mixed attenuation mass in the thyroid lobe with central area of necrosis. A destructive bony lesion involving the left 8th rib with large soft-tissue component and surrounding vascularity measures 7.3 × 5.5 cm with central area of necrosis. Subcentimetric mediastinal lymph nodes were seen with preserved fatty hila. No significant hilar or axillary lymph nodes were found.

A true-cut biopsy was taken from the chest wall mass revealing the presence of thyroid tissue. The findings were consistent with metastatic thyroid follicular carcinoma.

CT abdomen and pelvis (Fig. 3) showed multiple metastatic lesions throughout the abdomen involving the liver, right kidney, and both adrenals. Moreover, bony lesions were identified in the right iliac bone and the D5 vertebral body. These lesions were also identified on bone scan (Fig. 4) and appeared predominantly lytic lesions. The overall impression was a malignant process with distant metastasis. The suggested primary was thyroid cancer. To further support our diagnosis, I^{131} whole-body scan was performed (Fig. 5). The scan revealed multiple iodine avid foci involving the left chest wall, D5 vertebra, liver, right adrenal and kidney, and right iliac bone.

The patient's condition was discussed in a multidisciplinary tumor board meeting. The excellent functional performance of the patient at the time of presentation encouraged the treating team to use all available treatment modalities to overcome the disease with therapeutic intent. The management plan for this patient included four stages as follows: total thyroidectomy, surgical debulking of liver, renal and suprarenal metastatic lesions, chest wall resection and reconstruction, and finally radioactive iodine ablation. The surgical debulking was aimed to reduce the overall tumor burden, while iodine ablation acted to eradicate any remaining tumor cells. Furthermore, palliative radiation therapy was used to target the bony metastasis.

Total thyroidectomy was performed. The pathological diagnosis was capsulated follicular variant of papillary thyroid carcinoma involving the entire left lobe and part of the right lobe. Lymphovascular invasion was identified, although no extrathyroidal extension was present. Lymph node of the central neck compartment was negative for metastasis.

One month later, the patient was admitted for the debulking surgical procedures. He underwent segment 3 hepatic resection, bilateral adrenalectomy, and right partial nephrectomy. Pathology confirmed metastatic follicular variant of papillary thyroid carcinoma in all of the specimens removed. Follow-up in the clinic continued for

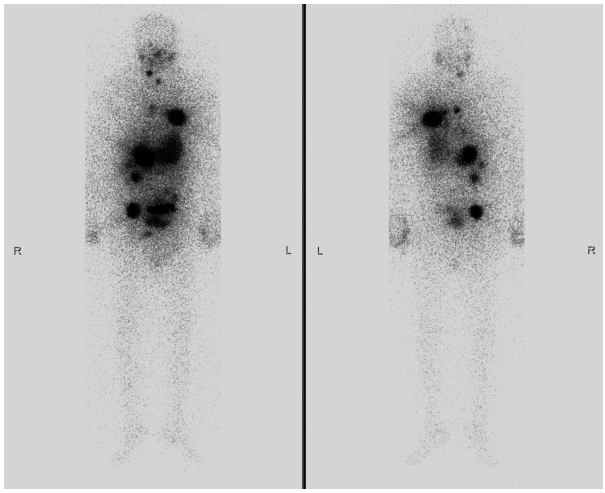

Figure 4. Bone scan showing uptake at metastatic sites.

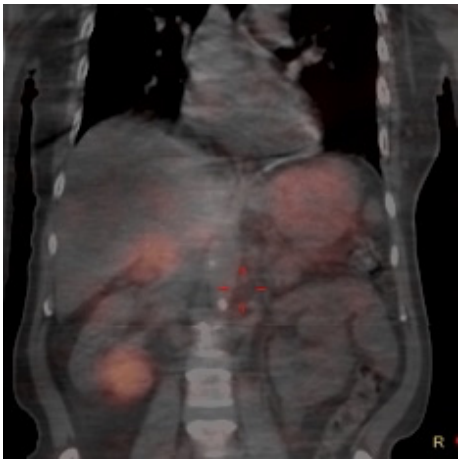

Figure 5. Iodine uptake scan showing visceral metastasis.

further hormonal replacement therapy. Follow-up CT was performed after these operations. CT neck revealed post-operative changes at the surgical bed with no gross residual or locally recurrent lesions. No cervical lymph nodes were seen either. The liver, adrenal, and renal masses had been surgically removed with no gross residual or obvious local recurrence. The destructive bony lesions and lung nodules were present and appeared stable in size. The pancreas, gallbladder, spleen, and left kidney remained grossly uninvolved.

Two months later, thoracotomy was performed to deal with the chest wall lesion. Chest wall resection and reconstruction involving the mass and parts of the left 6th, 7th, 8th, 9th, and 10th ribs were performed. The pathology report confirmed the presence of metastatic thyroid carcinoma showing follicular formation with negative surgical margins of excision.

Finally, the patient underwent iodine ablation and palliative irradiation to D5 vertebrae. The patient is now 8 months since his last surgical procedure and is in a stable remission state.

Discussion

The follicular variant of papillary thyroid cancer was first described as a separate entity in 1983. The characteristic nuclear features of papillary thyroid cancer were first reported by Lindsay in 1960. Twenty years later, Meissner claimed that the presence of these nuclear features in a follicular cancer warrants a different classification and termed such cases as "follicular variant of PTC" [4].

It is important to recognize these nuclear changes and identify FVPTC because it behaves differently than the follicular lesions it can be mistaken for. Follicular thyroid cancer typically metastasizes via the hematogenous route to distant organs. On the other hand, papillary thyroid cancer usually metastasizes to lymph nodes and only rarely spreads to other organs. FVPTC usually behaves as PTC invading the lymph nodes. However, cases have been reported in which FVPTC involved distant organ metastasis, similar to that seen in our case. In fact, a study has reported that FVPTC can behave differently depending on its subtype and pointed out the association of the nonencapsulated subtype of FVPTC with lymph node metastasis. It also stated that encapsulated FVPTC is like follicular thyroid cancer in its behavior and at the molecular level [1, 5].

Distant metastasis from differentiated thyroid cancer is rare [6]. It is even more rare for a follicular variant of PTC to metastasize to distant organs [6]. However, the most common metastatic sites are bone and lung [5]. Some cases have been reported when FVPTC has metastasized to the intra-abdominal organs [7–10]. However, the majority of these cases report involvement of one to two visceral organs in the absence of metastasis to other sites.

Our case is unique in that it combines the common sites, as well as the rare sites. Furthermore, we report the extensive involvement of visceral organs including the liver, the right kidney, as well as both adrenal glands. To the best of our knowledge, only one similar case has been reported in the literature which was FVPTC metastasizing to lungs, liver, both kidneys, and bone [8].

The presence of renal and concomitant adrenal involvement in the same patient has only been reported twice in the literature [6], once from a follicular thyroid cancer, and another from a papillary thyroid cancer [11]. This is the first case reporting follicular variant of papillary thyroid cancer involving these two organs simultaneously. Similarly, the latter case also involved the liver, lungs, and some bony tissue [11].

It has been observed that metastatic lesions from follicular variant of papillary thyroid cancer typically show papillary formation [12]. In our case, the follicular formation was seen at the primary tumor and at the metastatic sites.

Conclusions

We are reporting this rare metastatic case of FVPTC because of its interest for surgeons and physicians who are treating thyroid diseases. We also present protocol of palliative management carried out in stages to increase survival with good quality of life.

Authorship

All authors contributed significantly to the data retrieval, manuscript writing, and manuscript review.

Conflict of Interest

None declared.

References

1. Liu, J., B. Singh, G. Tallini, D. L. Carlson, N. Katabi, A. Shaha, et al. 2006. Follicular variant of papillary thyroid carcinoma. Cancer 107:1255–1264.
2. Lloyd, R. V., D. Buehler, and E. Khanafshar. 2011. Papillary thyroid carcinoma variants. Head Neck Pathol. 5:51–56.
3. Rosai, J. 2011. Rosai and Ackerman's surgical pathology. 10th ed. Elsevier Health Sciences, Edinburgh. Pp. 501–510.
4. Baloch, Z. W., and V. LiVolsi. 2000. Encapsulated follicular variant of papillary thyroid carcinoma with bone metastasis. Mod. Pathol. 13:861–865.
5. Gupta, S., O. Ajise, L. Dultz, B. Wang, D. Nonaka, J. Ogilvie, et al. 2012. Follicular variant of papillary thyroid cancer: encapsulated, non-encapsulated, and diffuse: distinct biologic and clinical entities. Arch. Otolaryngol. Head Neck Surg. 138:227–233.
6. Song, H. J., Y. LiXue, Z. L. Qiu, and Q. Y. Luo. 2012. Uncommon metastases from differentiated thyroid carcinoma. Hell J. Nucl. Med. 15:233–240.
7. Djenic, B., D. Duick, J. O. Newell, and M. J. Demeure. 2015. Solitary liver metastasis from follicular variant papillary thyroid carcinoma: a case report and literature review. Int. J. Surg. Case Rep. 6:146–149.
8. Lubana, S. S., N. Singh, S. S. Tuli, T. Bashir, I. Sachmechi, and M. M. Kemeny. 2015. Follicular variant of papillary thyroid cancer with bilateral renal metastases discovered incidentally during work-up of primary endometrial cancer: a rare occurrence. Am. J. Case Rep. 16:459–468.
9. Tur, G. E., Y. Asanuma, T. Sato, H. Kotanagi, M. Sageshima, Z. Yong-Jie, et al. 1994. Resection of metastatic thyroid carcinomas to the liver and the kidney: report of a case. Surg. Today 24:844–848.
10. Ginzburg, S., M. Reddy, C. Veloski, E. Sigurdson, J. A. Ridge, M. Azrilevich, et al. 2015. Papillary thyroid carcinoma metastases presenting as ipsilateral adrenal mass and renal cyst. Urol. Case Rep. 3:221–222.
11. Malhotra, G., T. S. Upadhye, E. Sridhar, R. V. Asopa, P. S. Garde, S. Gawde, et al. 2010. Unusual case of adrenal and renal metastases from papillary carcinoma of thyroid. Clin. Nucl. Med. 35:731–736.
12. Nwaeze, O., S. Obidike, D. Mullen, and F. Aftab. 2015. Follicular variant papillary thyroid carcinoma with a twist. Int. J. Surg. Case Rep. 8:107–110.