Radiology Case Reports 18 (2023) 2279–2281

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

Case Report

A case report of diagnosis of liver metastasis of medullary thyroid carcinoma by multimodal ultrasound ☆,☆☆

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ARTICLE INFO

Article history:
Received 11 January 2023
Revised 12 March 2023
Accepted 17 March 2023

Keywords:
Liver metastasis of medullary thyroid carcinoma
Multimodal ultrasound

ABSTRACT

Medullary thyroid carcinoma is a rare malignant neuroendocrine tumor. Distant metastasis is difficult to detect early. It is most common in lung, liver, bone and brain. This case was reported as liver metastasis of medullary thyroid carcinoma in an elderly woman, but routine ultrasound findings were atypical. After a series of relevant imaging examinations, contrast-enhanced ultrasound and ultrasound-guided puncture biopsy were used to confirm the nature of the intrahepatic lesions. Therefore, we believe that multimodal ultrasound is of great value in the diagnosis of liver metastasis of medullary thyroid carcinoma.

Introduction

Medullary thyroid carcinoma is a rare malignant neuroendocrine tumor originating from thyroid parafollicular cells [1]. The liver is the most common site of NENs metastasis, which is often detected at initial diagnosis, but its routine ultrasound findings lack specificity, which often leads to delayed development of the disease. In this paper, we report a case of liver metastasis with medullary thyroid carcinoma and analyze its multimodal ultrasound and other imaging features.

The patient, female, 69-year-old, was admitted to hospital for liver and lung space occupation 1 month after physical examination. In 2018, she had the "radical thyroidectomy and modified dissection of right cervical lymph nodes" for medullary thyroid carcinoma. Preoperative ultrasound examination showed slightly strong echoic nodules in the right lobe of liver, considering the possibility of hemangioma (Fig. 1).

☆ Acknowledgments: Funded by the Horizontal Research Fund of Qingdao University (Item number: RH2000001632).
☆☆ Competing Interests: The authors report no conflicts of interest in this work.
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https://doi.org/10.1016/j.radcr.2023.03.036

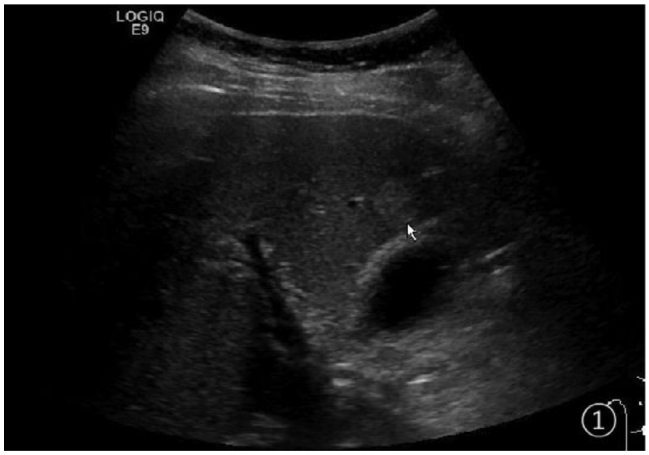

Fig. 1 – Preoperative hepatic ultrasound showed slightly strong echoic nodules in the liver, about 1.6 × 1.2 cm in size, indicating the hemangioma.

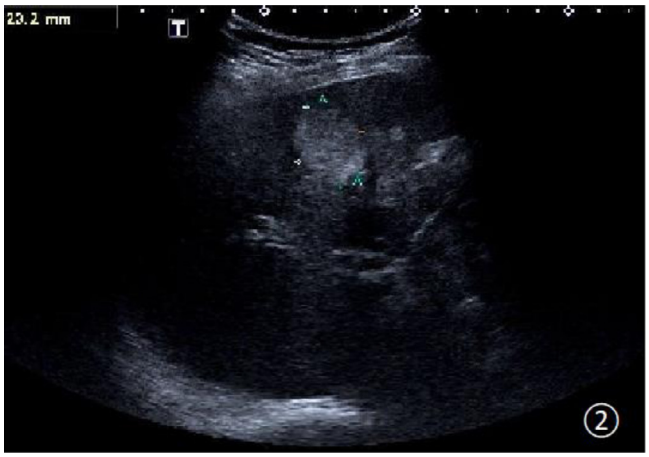

Fig. 2 – The slightly strong echoic nodules in the liver were reexamined in this admission, and the larger ones were about 3.0 × 2.3 cm.

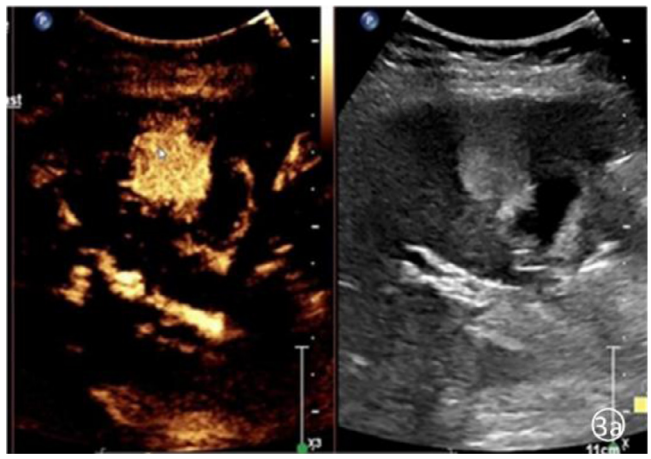

Fig. 3(A) – Liver contrast ultrasound showed that the perfusion of nodules was earlier than that of surrounding normal liver parenchyma, showing uniform and high enhancement.

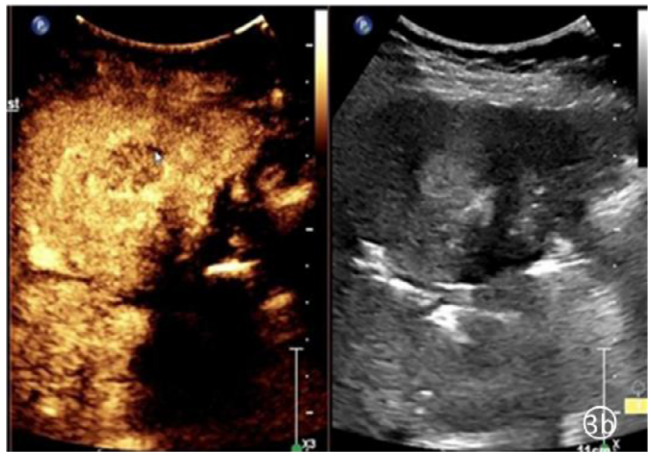

Fig. 3(B) – After rapid dissection, the nodules showed low enhancement, and the lesions showed "fast forward and fast out."

After radical thyroidectomy operation, serum calcitonin level did not decrease to normal and fluctuated greatly (fluctuation range: 742.6~1535 pg/mL). The patient was not examined or treated at another hospital during this period. Laboratory examination in this hospital showed that the serum calcitonin was more than 2000 pg/mL (normal range: 0.00~6.40 pg/mL). The ultrasound of liver showed that there are many slightly strong echoic and hypoechoic nodules in the right lobe of liver, which are larger and more than before, and the larger one was about 3.0 × 2.3 cm, not excluding the possibility of hemangioma (Fig. 2). Contrast-enhanced ultrasound examination of liver indicated that nodule perfusion was earlier than the surrounding normal liver parenchyma, showing uniform high enhancement, low enhancement after rapid clearance, and the enhancement mode was "fast forward and fast out" (Figs. 3A and B), suggesting the possibility of malignant tumor. Further enhanced MRI examination showed that there was multiple round-like and slightly longer T1 and T2 signal shadows in liver parenchyma, and DWI showed high signal intensity. Enhanced scanning showed obvious enhancement in arterial phase, and decreased enhancement in venous phase and delayed phase, suggesting multiple space occupying in liver, which did not exclude the possibility of malignant lesions (Fig. 4). Based on the above imaging findings and serological indicators, the possibility of liver metastasis of medullary thyroid carcinoma was considered. Ultrasound-guided biopsy of intrahepatic nodules was performed. The pathological results showed infiltration of cancer in liver tissue, and the positive rate of TTF-1 (+), CK19 (a small amount of weak +), Syn (+), CgA (+) and Ki67 was about 5%. TTF-1 (+) suggests that the tumor originated from lung or thyroid tissue. Syn (+) and CgA (+) suggest that the origin of neuroendocrine tumors. The results supported neuroendocrine tumors (low grade) and accorded with liver metastasis of medullary thyroid carcinoma (Fig. 5).

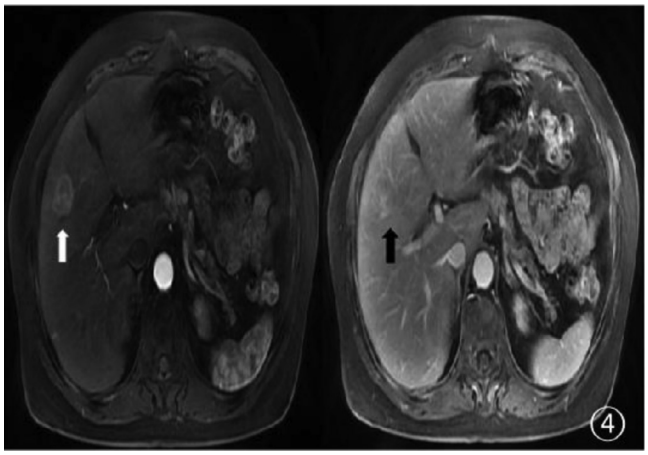

Fig. 4 – Enhanced MRI images of nodules: The left side showed obvious enhancement in arterial phase, the right side showed decreased enhancement in delayed phase, and the arrow shows the lesion site.

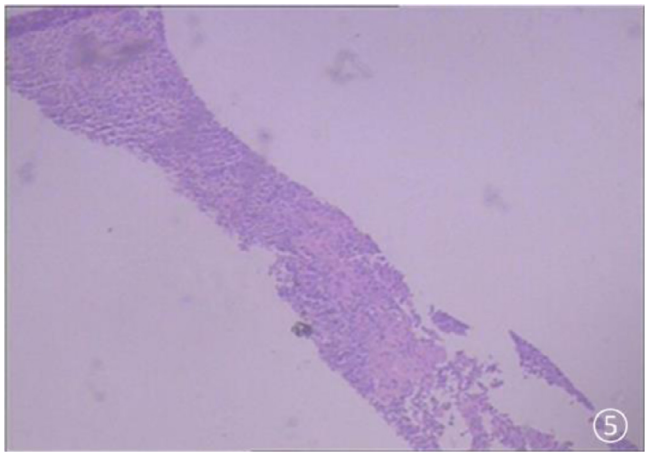

Fig. 5 – Intrahepatic nodule puncture biopsy pathologically showed cancer infiltration in liver tissue, which supported neuroendocrine tumor (low grade) and accorded with liver metastasis of medullary thyroid carcinoma.

Discussion

Medullary thyroid carcinoma (MTC) originates from parafollicular cells (C cells) of the thyroid gland and can secrete calcitonin (Ctn) in large quantities. It is a kind of rare malignant neuroendocrine neoplasms (NENs), accounting for 1% ~ 2% of thyroid carcinoma, and the mortality rate is about 8.6% [1]. If the Ctn level in human body continues to increase after MTC, it often indicates the risk of local recurrence, cervical lymph node metastasis or distant metastasis [2,3]. Lung, bone, brain and liver are common distant metastasis sites of MTC. At present, the detection of metastatic lesions mostly depends on CT, MRI and other imaging methods, and the ultrasonic manifestations of liver metastasis of MTC are rarely reported.

Liver is the most common metastatic site of NENs, and about 2/3 of NENs patients have liver metastasis at the first diagnosis [4,5]. Some studies [6] show that the conventional ultrasound manifestations are mainly high and low echo, which is different from the "bull's eye sign" of common liver metastases and lacks specificity. In this case, liver metastasis is secondary to medullary thyroid carcinoma, which is difficult to distinguish from hyperechoic hemangioma by conventional ultrasound, while contrast-enhanced ultrasound shows high enhancement and "fast-forward and fast-out" perfusion characteristics, thus ruling out the diagnosis of hemangioma. Ultrasound-guided puncture biopsy was used to obtain tumor tissue, which provided a more reliable basis for the determination of tumor characterization and tissue origin.

To sum up, the positive rate and sensitivity of conventional ultrasound for liver metastasis of medullary thyroid carcinoma are higher [7], but the specificity is lower. It is necessary to combine multimodal diagnosis and treatment of contrast-enhanced ultrasound and ultrasound-guided puncture biopsy to provide more image information and accurate pathological diagnosis for clinical diagnosis and treatment of this disease.

Patient consent

I confirm that the patient's written informed consent was obtained for publication of her case.

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