Case Report / Olgu Sunumu

Well differentiated papillary carcinoma of thyroid presenting as metastatic liver mass

Metastatik karaciğer kitlesi olarak ortaya çıkan iyi diferansiye papiller tiroid karsinomu

Biswajit Mishra, MD.,[1] Anupama Tandon, MD.,[1] Neelam Wadhwa, MD.,[2] Gopesh Mehrotra, MD.,[1] Shuchi Bhatt, MD.,[1] Shalini Rajaram, MD.[3]

[1]*Department of Radiodiagnosis and Imaging, University College of Medical Sciences and Guru Teg Bahadur Hospital, New Delhi, India*
[2]*Department of Pathology, University College of Medical Sciences and Guru Teg Bahadur Hospital, New Delhi, India*
[3]*Department of Obstetrics and Gynaecology, University College of Medical Sciences and Guru Teg Bahadur Hospital, New Delhi, India*

ABSTRACT

Well differentiated papillary carcinoma of thyroid frequently metastasizes to regional lymph nodes and the patients usually present with cervical or mediastinal lymphadenopathy. In this article, we report a case of papillary thyroid carcinoma with hepatic metastasis presenting as liver mass in absence of lymph nodal metastasis, a presentation not previously reported to the best of our knowledge.

Keywords: Hypervascular metastasis; liver metastasis; metastatic papillary carcinoma of thyroid.

ÖZ

İyi diferansiye papiller tiroid karsinomu sıklıkla bölgesel lenf nodlarına metastaz yapar ve hastalarda genellikle servikal veya mediastinal lenfadenopati olur. Bu yazıda, bildiğimiz kadarıyla daha önce bildirilmemiş bir görünüm olan lenf nodu metastazı olmadan karaciğer kitlesi olarak ortaya çıkan hepatik metastazlı bir papiller tiroid karsinomu olgusu sunuldu.

Anahtar Sözcükler: Hipervasküler metastaz; karaciğer metastazı; metastatik papiller tiroid karsinomu.

Papillary carcinoma is the most common neoplasm of the thyroid gland and accounts for about 80% of all thyroid carcinomas.[1] This carcinoma is generally well differentiated and has a propensity to invade lymphatics rather than blood vessels.[2] Clinical presentation typically is with enlarged neck nodes and often the primary mass is detected only on imaging. Hematogenous dissemination is rare, though 10-15% patients can have metastasis to lungs and bones at the time of diagnosis.[3] Distant metastasis to the liver is even rarer with a reported frequency of only 0.5%. Only 10 cases of liver metastasis could be found on extensive literature search.[4]

CASE REPORT

A 42-year-old female presented with right hypochondrial pain of gradually increasing severity over one month duration. The general physical examination was unremarkable except

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Correspondence / İletişim adresi: Anupama Tandon, MD. Department of Radiodiagnosis and Imaging, University College of Medical Sciences and Guru Teg Bahadur Hospital, 110095 New Delhi, India.
Tel: +91 986 839 95 75 e-mail *(e-posta):* anupamatandon@hotmail.com

for mild pallor. Systemic examination revealed mild tender hepatomegaly with the liver palpable 2 cm below the costal margin; the rest of the abdominal examination was normal. Ultrasonography of the abdomen revealed a well-defined large isoechoic soft tissue mass in the right lobe of the liver measuring 11.3x9.9 cm (Figure 1). It was heterogeneous in appearance with few eccentric hypoechoic areas but no calcification or hemorrhage seen within. On color Doppler the lesion was highly vascular with multiple branching arteries traversing from the periphery to the center of the lesion. In addition, sonography also revealed multiple small hyperechoic focal lesions randomly scattered in both lobes of the liver, a few of these showing central hypoechogenicity. These lesions were too small to be characterized by color Doppler. The portal vein was normal in course, caliber and demonstrated normal flow. The rest of the abdominal organs were unremarkable.

Triple phase contrast-enhanced computed tomography (CT) of the abdomen done on a 64-slice CT scanner revealed a large well defined soft tissue lesion in the right lobe of liver, which showed moderate heterogeneous enhancement in the arterial phase of contrast study becoming hyperdense to the rest of the liver parenchyma. It continued to enhance in the portal phase and became hypodense to liver parenchyma in the equilibrium phase (Figure 2). There were eccentric non-enhancing areas in the lesion which could represent areas of necrosis or a non-enhancing scar. Another small hypodense lesion was seen in the left lobe of the liver (Figure 2), but the multiple small lesions seen on sonography could not be visualized on CT of the abdomen. The rest of the solid organs and bowel loops were unremarkable, no evidence of significant lymphadenopathy or ascites was seen, and the adrenals appeared normal. In addition, a well-defined, lytic punched out lesion was seen in the iliac bone adjacent to the right sacroiliac joint.

The imaging differentials considered were fibronodular hyperplasia, fibrolamellar carcinoma or metastatic disease from a hypervascular tumor. As metastasis was a differential, screening of the neck, breast and thorax was done to look for a possible primary and other sites of metastasis. Ultrasonography of the neck revealed an ill-defined hypoechoic lesion with microcalcification in the left thyroid lobe measuring 2.3x1.8 cm (Figure 3). There was internal vascularity with high resistance flow (RI-0.8). No evidence of significant cervical and mediastinal lymphadenopathy or pulmonary metastasis was seen. A sonographic diagnosis of malignant thyroid nodule was considered.

Ultrasound guided fine needle aspiration of the thyroid nodule was performed with 21-guage needle attached to a 10 mL syringe under aseptic conditions. Both May Grunwald Giemsa and Papanicolaou stained smears were highly cellular and colloid was scant. Thyroid follicular cells were present in clusters and papillary fragments. The cells had powdery

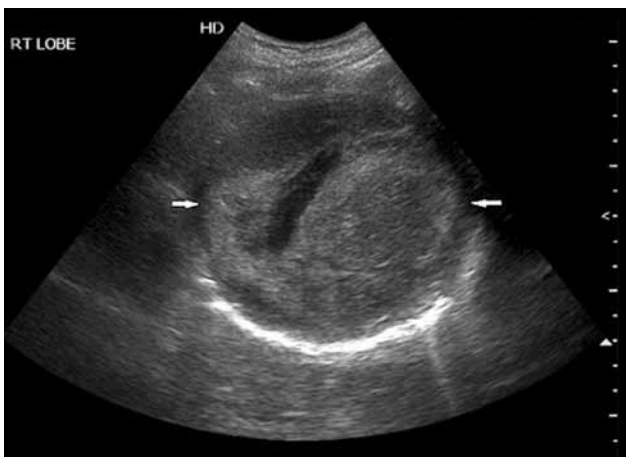

Figure 1. *Ultrasound showing a large well defined metastatic lesion in the right lobe of the liver (arrows).*

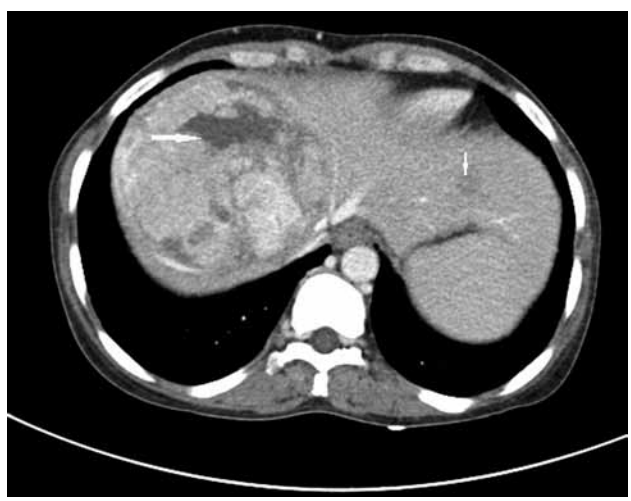

Figure 2. *Triple phase contrast enhanced computed tomography of the abdomen in portal phase showing a large heterogeneous lesion with central necrosis (large arrow) and a small heterogeneous lesion in the left lobe (small arrow).*

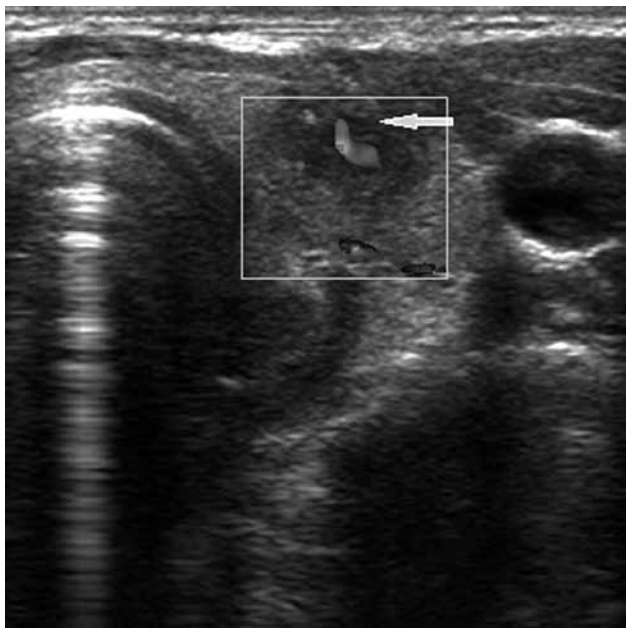

Figure 3. *Ultrasound showing hypoechoic lesion in the left lobe of the thyroid with central vascularity (arrow) and areas of microcalcification diagnostic of papillary carcinoma.*

nuclear chromatin. Many cells showed nuclear grooves and few had intranuclear cytoplasmic inclusions; features characteristic of papillary carcinoma of the thyroid (Figure 4).

Fine needle aspiration of the liver mass was also performed under ultrasound guidance. Clusters of malignant epithelial cells with nuclear features typical of papillary carcinoma were identified scattered in between sheets of reactive

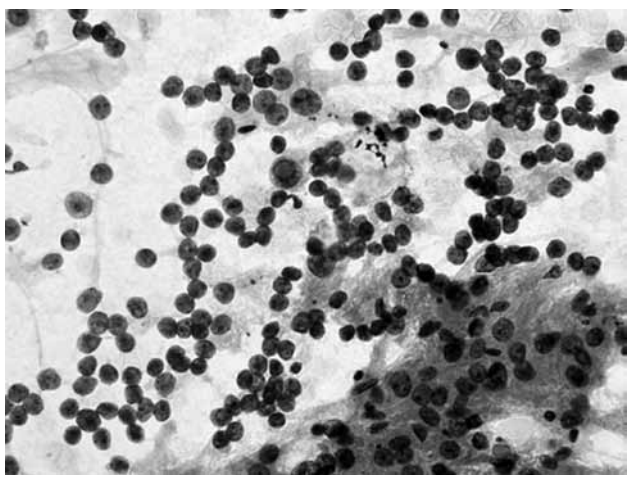

Figure 5. *Fine needle aspiration of the liver mass: Clusters of malignant cells with nuclear features similar to those seen in the thyroid aspirate scattered amongst hepatocytes (Papanicolau stain x 400).*

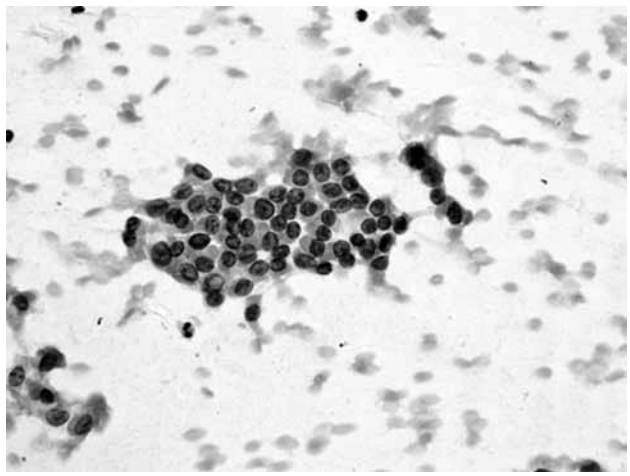

Figure 4. *Fine needle aspiration cytology of the thyroid nodule: Cluster of thyroid follicular epithelial cells with intra-nuclear inclusion (arrow) and nuclear grooves characteristic of papillary carcinoma (Papanicolau stain x 400).*

hepatocytes (Figure 5). Cytological diagnosis of papillary carcinoma of thyroid metastatic to the liver was rendered.

The patient was referred to the department of oncology for co-management. She underwent total thyroidectomy with radical neck dissection. Thyroidectomy specimen showed a grey white tumor in the left lobe distinct from the adjacent mahogany brown healthy thyroid gland. The specimen was processed in toto. Sections showed a carcinoma with predominant papillary

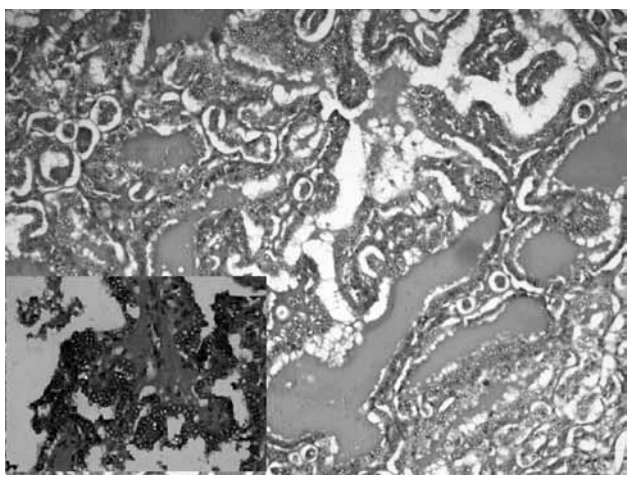

Figure 6. *Histopathology of the thyroid gland: Typical papillary configuration with broad branching fibro-vascular cores and lining tumor cells with inset (x 400) showing optically clear nuclei with nuclear overlapping characteristic of papillary carcinoma of the thyroid.*

architecture. The tumor cells had characteristic nuclear features of intranuclear inclusions and nuclear grooves. The histology was typical of papillary carcinoma of the thyroid (Figure 6). None of the 15 lymph nodes recovered from neck dissection showed tumor metastasis.

The patient had a post-surgery thyroid-stimulating hormone level of 31 mU/L, thyroglobulin 360 µg/L and normal hepatic function tests including normal prothrombin time, partial thromboplastin time, serum albumin, total bilirubin aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase. Thereafter she was given radioactive iodine-131 therapy (150 mCi). Post-treatment thyroglobulin level at 10 weeks was reduced to 28 µg/L suggesting reduction of iodine concentrating tissue in the liver. Although written informed consent for these procedures and their reporting had been obtained from the patient, further follow-up could not be done as the patient left the hospital against medical advice.

DISCUSSION

Papillary carcinoma of the thyroid is a relatively slow growing neoplasm and has a less severe clinical course, behaving unlike other thyroid cancers such as follicular and anaplastic carcinoma that are more aggressive and often metastasize or infiltrate locally.[5,6]

Papillary carcinoma readily metastasizes to loco-regional lymph nodes. Several studies have indicated that cervical lymph node metastasis may be present at the time of initial diagnosis in approximately one third of patients with well-defined thyroid carcinoma and is more common in papillary than in follicular carcinoma.[7] Distant hematogenous dissemination is rare, though 10-15% patients can have metastasis to lungs and bones at the time of diagnosis.[3] Other rare sites of metastasis are liver and brain. Liver metastasis has been found in only 0.5% cases of well-differentiated papillary carcinoma with only 10 cases reported in the English literature.[4]

Metastases from thyroid carcinoma are hypervascular. These metastases are usually echogenic on sonography and show increased vascularity on Doppler study. On non contrast CT metastases may be hypo or hyperdense. Some lesions may show central hypodensity (due to necrosis) or calcification. The enhancement pattern is characteristic, showing diffuse enhancement in the arterial phase, with washout in the portal phase often becoming hypodense in the equilibrium phase. On magnetic resonance imaging these metastases are hypointense on T_1-weighted and hyperintense in T_2-weighted images. Post iron oxide T_2-weighted images are most sensitive in detecting liver metastasis. The imaging differentials of hypervascular focal liver masses in a middle aged female patient are fibronodular hyperplasia, fibrolamellar carcinoma, large hemangioma and hypervascular metastasis.

Fibronodular hyperplasia is a solitary tumor that shows diffuse immediate enhancement in arterial and portal phase becoming hypodense in delayed phase. There exists a hypodense scar at the center of the lesion that enhances in the delayed phase. In the present case absence of central scar and presence of multiple small lesions in both lobe of liver were against this diagnosis.

Fibrolamellar carcinoma usually has a lobulated surface with calcification at the center. 50% of fibrolamellar carcinomas show lymph nodal metastasis. Absence of these features and presence of multiple lesions in both lobe of liver made this diagnosis less likely in our case.

Hemangiomas are hyperdense on non contrast CT and show characteristic enhancement pattern. There is peripheral globular enhancement on contrast administration with gradual centripetal filling, and delayed preservation of contrast unlike metastasis which enhance diffusely in the arterial phase with washout in the equilibrium phase.

Our case is unique in that there is distant spread of thyroid papillary carcinoma resulting in hepatic metastasis without cervical lymphadenopathy. To the best of our knowledge this is the first reported case of papillary carcinoma of the thyroid presenting as a liver mass.

In view of the hematogenous distant metastasis in this case, the surgeon's choice was radical neck dissection, however a less extensive procedure like modified neck dissection was a valid option.[8]

Differentiated thyroid cancer is usually indolent with good prognosis and long-term

survival. Distant metastasis is often a grave event and accounts for most disease specific mortality. The presence of distant metastasis is the most significant poor prognostic factor for survival with only 50% of patients with metastasis surviving after 10 years.

To conclude, rare metastases from well-differentiated papillary carcinoma, due to their extremely low incidence are usually not taken into account in routine clinical practice. However, recognizing the patterns of these rare metastases have a significant impact on clinical decision making and prognosis of the patients.

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