JDCR
Journal of Digestive Cancer Research
https://doi.org/10.52927/jdcr.2025.13.2.194
pISSN: 2950-9394 eISSN: 2950-9505
Journal of Digestive Cancer Research 2025;13(2):194-196

CASE REPORT

Metastatic Small Cell Neuroendocrine Carcinoma Presenting with Liver Metastasis

Hye Yeon Chon[1,2]

[1]Department of Internal Medicine, Yonsei University College of Medicine, Seoul, [2]Division of Gastroenterology, Yongin Severance Hospital, Yonsei University Health System, Yongin, Korea

Received July 15, 2025
Revised July 26, 2025
Accepted July 26, 2025

Corresponding author:
Hye Yeon Chon
E-mail: chen061922@yuhs.ac
https://orcid.org/0000-0003-4009-8180

A 72-year-old female presented with weight loss and poor oral intake. Multiple hepatic masses and enlarged lymph nodes (LNs) observed on imaging raised the suspicion of metastatic disease. Esophagogastroduodenoscopy and colonoscopy were unremarkable. Liver biopsy confirmed the diagnosis of metastatic small cell neuroendocrine carcinoma, with immunohistochemistry (IHC) findings indicative of the primary tumor being from the lungs (CK [AE1/3]+, TTF-1+, INSM1+, CD45-, Vimentin-). Widespread metastases to the liver, LNs, and bones were evident on positron emission tomography-computed tomography. The patient underwent four cycles of chemotherapy with etoposide and cisplatin (EP regimen); however, pneumonia and anemia complicated the treatment and the patient had to be referred to hospice care. This case highlights the importance of IHC in diagnosing metastatic disease and the challenges of managing extensive metastases in elderly patients with comorbidities.

Key Words: Neuroendocrine carcinoma; Neoplasm metastasis; Immunohistochemistry

INTRODUCTION

Neuroendocrine carcinoma is a rare type of tumor, most frequently found in the lungs, pancreas, or gastrointestinal tract, although their primary site is undetermined in certain cases [1]. Here, we discuss a neuroendocrine carcinoma case in which initially presented with liver metastasis and identified the primary site with immunohistochemistry (IHC).

CASE

A 72-year-old female was transferred due to suspected liver metastasis on an abdominal pelvic computed tomography (CT) scan performed for poor oral intake. She was social drinker and had a history of smoking one pack per day but had quit three months prior to admission. There was no significant family history. Notably, her weight had decreased from 53 kg to 39 kg. During evaluation for weight loss, she was diagnosed with atrial fibrillation and diabetes mellitus. She was also on mediation for hypertension and dyslipidemia.

The patient was admitted to the hepatology department for further evaluation, including identifying the primary lesion and obtaining a tissue biopsy. On physical examination, no remarkable findings were observed. Vital signs were as follows: blood pressure, 155/100 mmHg; heart rate, 96 beats per minute; respiratory rate, 18 breaths per minute; and body temperature, 36.4℃.

Contrast enhanced chest CT revealed multiple enlarged mediastinal lymph nodes (LNs), bilateral pleural effusion, subpleural interstitial thickening in the bilateral lower lobes, and subpleural nodular opacity in the left lower lobe (Fig. 1). Liver dynamic pelvis CT demonstrated multiple hepatic masses, the largest measuring 2.8 cm, along with multiple enlarged retroperitoneal LNs (Fig. 2). Esophagogastroduodenoscopy and colonoscopy were unremarkable.

A liver biopsy was performed. The result was compatible

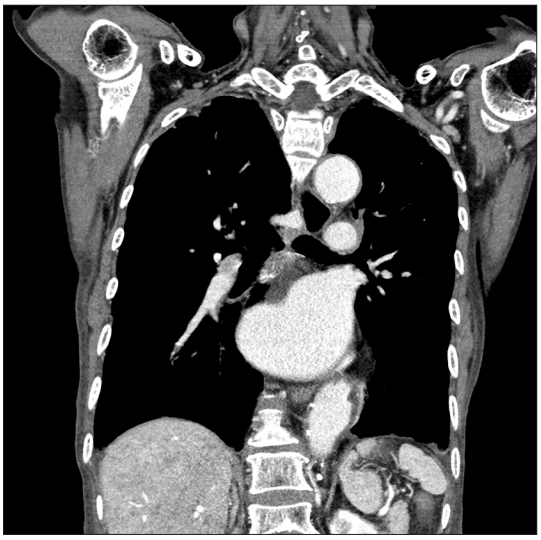

Fig. 1. Contrast enhanced chest computed tomography revealed multiple enlarged mediastinal lymph nodes and subpleural nodular opacity in the left lower lobe.

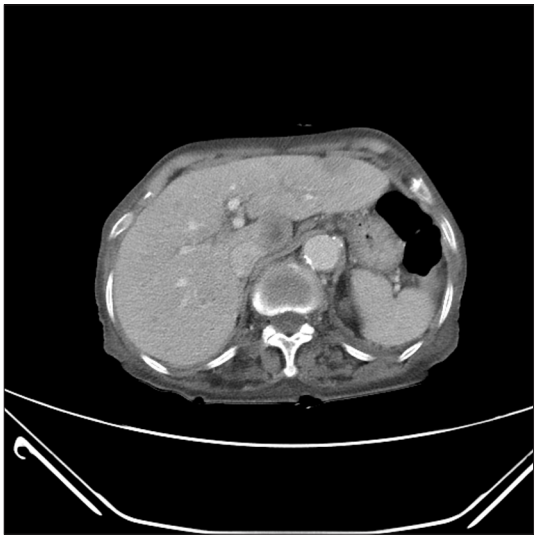

Fig. 2. Liver dynamic pelvis computed tomography demonstrated multiple hepatic masses, the largest measuring 2.8 cm.

with metastatic small cell neuroendocrine carcinoma regarding IHC staining results which were as follows: CK (AE1/3) positive, thyroid transcription factor 1 (TTF-1) positive, INSM1 positive, CD45 (LCA) negative, Vimentin negative.

18F-fluorodeoxyglucose positron remission tomography-CT showed increased fluorodeoxyglucose uptake in the hepatic mass, multiple LN metastasis (right lower neck, mediastinum, upper abdomen), several small pleural/subpleural nodules and throughout the whole axial and proximal appendicular skeleton, confirming extensive metastatic disease (Fig. 3).

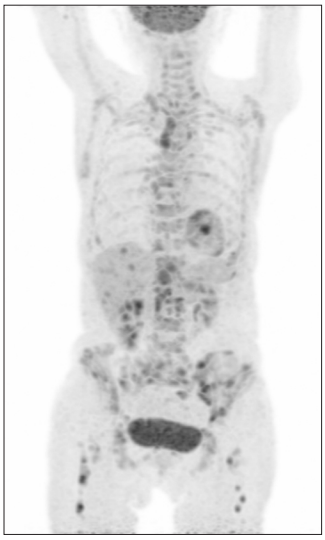

Fig. 3. 18F-fluorodeoxyglucose positron remission tomography-computed tomography showed increased fluorodeoxyglucose uptake in the hepatic mass, multiple lymph node metastasis and whole axial and proximal appendicular skeleton.

The patient was transferred to the oncology department. Although she underwent four cycles of chemotherapy with etoposide and cisplatin at a 50% dose reduction due to thrombocytopenia, her general condition deteriorated owing to pneumonia and anemia, leading to hospice care referral.

DISUCSSION

Neuroendocrine neoplasm are a diverse group of tumors characterized by neuroendocrine differentiation and can develop in various organ throughout the body [1]. Histologically, neuroendocrine neoplasm is categorized into two primary types; well-differentiated neuroendocrine tumors and poorly differentiated neuroendocrine carcinoma. The most common site is gastrointestinal tract, followed by lung, head and neck, thymus, thyroid, breast, skin and genitourinary system [2]. However, in certain cases, neuroendocrine neoplasms are diagnosed through histological analysis, but their primary source remains unidentified. In those cases, IHC could help to figure out the origin of the tumor. Among

them, TTF-1 typically present in pulmonary tumor [3].

Small cell neuroendocrine carcinoma is an aggressive malignancy with rapid progression and early metastatic spread. The majority of newly diagnosed small cell lung cancer (around 67%) have extensive stage disease, with 17% suffering from liver metastasis, a condition that corresponds to a poor 1-year survival rate of 19% [4]. In patients with unresectable extensive stage disease, the main treatment strategy is systemic chemotherapy with etoposide and platinum-based chemotherapy [5].

This case highlights a scenario where the neuroendocrine carcinoma first manifested as hepatic metastasis. The patient's clinical course underscores the importance of early diagnosis, comprehensive metastatic evaluation, and the need for close monitoring during chemotherapy to manage complications such as thrombocytopenia and infection. This case emphasize the role of IHC in determining the primary tumor origin and the challenges associated with managing extensive metastatic disease in elderly patients.

FUNDING

None.

CONFLICTS OF INTEREST

Hye Yeon Chon is an editorial board member of the journal, but was not involved in the review process of this manuscript. Otherwise, there is no conflict of interest to declare.

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