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CASE REPORT

Case Report Of Liver Neuroendocrine Tumor Detected Incidentally During Ovarian Cyst Surgery; Liver Neuroendocrine Tumor and Ovarian Cyst

ABSTRACT

Introduction: Neuroendocrine tumors, which are also known as carcinoid tumors (also "Argentaffin" or "Kulchitsky Cells"), are derived from embryonal neural crest cells that have the potential to regulate hormone secretion. The aim of this article is to present a liver neuroendocrine tumor that was detected incidentally in a patient who underwent total abdominal hysterectomy and bilateral salpingo-oophorectomy due to an ovarian mass.

Case Report: A 73-year-old female patient applied with complaints of abdominal pain and swelling. A solid mass of 15 cm that originated from the right adnexal area was detected. During the surgery of this mass, the intra-abdominal evaluation revealed a nodular lesion in the liver incidentally. The final pathology result revealed an ovarian serous borderline tumor and liver neuroendocrine tumor.

Conclusion: During abdominal surgery, especially for mass surgery, manual exploration of the abdominal organs is very important even if not detected on preoperative imaging. Incidentally detected masses may be part of a syndrome or primary tumors. A differential diagnosis must also be made in terms of paraneoplastic syndrome.

Keywords: Neuroendocrine tumor, liver, adnexal mass, serous borderline

Introduction

Neuroendocrine tumors (NETs), also called carcinoid tumors (also called "Argentaffin" or "Kulchitsky cells"), derive from embryonal neural crest cells that may also have the potential to secrete hormones (1). It shows different clinical manifestations depending on its components and location (2). Recent epidemiologic analyses have indicated that neuroendocrine tumors (NETs) occur most frequently in the lung, with an incidence rate of 1.49 per 100,000 individuals, followed by 1.05 per 100,000 in the small intestine, 1.04 per 100,000 in the rectum, and 0.48 per 100,000 in the pancreas (3). However, the liver is a common site for metastatic NETs and neuroendocrine carcinomas (NECs), leading to difficulties in determining whether a neuroendocrine neoplasm in the liver is primary or metastatic (4).

It can be difficult to diagnose because of its nonspecific radiographic characteristics, often confused with other types of liver lesions. However, histopathology and immunohistochemistry may help to make the correct diagnosis of NETs (5).

Symptoms of undetected and untreated neuroendocrine tumors can be wide-ranging, such as uncontrolled hypertension, headache, facial flushing, sweating, flushing, heart rhythm disturbances, panic attack symptoms, and anxiety (6). They generally show a slow progression. Tumor burden might be asymptomatic or present quite severe clinical symptoms in proportion to the size of the mass. Classification is made according to the histological tumor grading (Table 1).

Its overall prognosis is better than other types of liver cancer with an average survival of 16.5 months (7). It may recur or metastasize within 1-10 years after surgical resection. The prognosis of primary hepatic NECs is extremely poor. The 5-year survival rate is only 5.8% and the 1-year survival rate is 23.5% for metastatic poorly differentiated NEC (7, 8).

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It is important to determine the diagnosis and differential diagnosis well. Symptoms may coexist in many ways. Chromogranin A, neurospecific enolase, pancreatic polypeptide, pancreastatin biomarkers can be used in diagnosis, treatment and monitoring (9).

The purpose of this case report was to present the coexistence of an independent liver NET and ovarian serous borderline tumor, which was operated in our clinic because of an adnexal mass and was not detected in preoperative imaging.

Case Report

The patient was 73 years old and presented to the clinic with complaints of abdominal pain and swelling. She had diabetes mellitus and coronary artery disease as comorbidities. Pelvic sonography revealed a thick-walled solid mass of approximately 15 cm in the right adnexal area with multiple nodularities. Preoperative tumor markers CA-125 (184 u/mL) and CA 19-9 (52.5 u/mL) were elevated. Contrast-enhanced magnetic resonance imaging of the whole abdomen revealed a cystic lesion in the right lower half of the abdomen (127x122x107 mm, hypointense on T1-weighted images, hyperintense on T2-weighted images, no contrast uptake after IVCM injection) and no pathologic findings were found in the liver. Hypointense nodular areas in the lesion wall on T2-weighted images were consistent with calcification.

The patient was taken into surgery after appropriate preoperative preparations. During abdominal observation, a 12x15 cm torsionized ecchymotic and necrotic cystic mass arising from the right ovary was detected. There were no findings suggestive of torsion in the preoperative imaging. The diagnosis was made intraoperatively. During surgery, all adnexal structures were found to be torsioned and adherent as a conglomerated mass. The torsiated mass was edematous and densely adherent to the proximal cecum and appendix. The mass was excised. During abdominal inspection, a nodular lesion was incidentally detected in the 6th segment of the liver. The hepatic mass was also excised for pathologic examination. The final pathology result revealed an ovarian serous borderline tumor and liver neuroendocrine tumor.

NET in the liver by Hematoxylin-Eosin (H&E) staining at 40x and 100x magnification is shown in figures 1 and 2. Postoperative PET CT results showed no other organ pathology, and the patient was followed up at short intervals. Patient management included postoperative check-ups on the 10th day, 1st month, and 3rd month.

Discussion

In this case report, we report a case of hepatic NET that was not detected on preoperative imaging but was detected on intraoperative inspection and palpation in a patient undergoing surgery for a possible gynecologic malignancy. This case demonstrates the importance of intraoperative inspection, even if preoperative imaging is negative.The most important point is to suspect criteria that may be symptoms of NET.Chronic hot flushes and/or diarrhea are typical symptoms of carcinoid syndrome caused by the release of serotonin and other vasoactive substances into the systemic circulation. Clinical signs such as hypertension, flushing, headache and excess serotonin may be indicative. Pain, gastrointestinal symptoms and fatigue are the most common initial symptoms (10,11). The rarity of PHNETs makes their diagnosis challenging. While imaging is not always significant, it clearly demonstrates the importance of exploration. The majority of liver NETs are metastases from the gastrointestinal tract or pancreas (10). Therefore, a comprehensive diagnostic approach with endoscopy, somatostatin receptor imaging, PETCT, and biochemical testing for activation biomarkers is necessary to exclude extrahepatic primary lesions. In our case, no extrahepatic primary focus was identified, confirming the diagnosis of a primary hepatic lesion. This approach is consistent with the recommendations of the North American Neuroendocrine Tumor Society (NANETS), which emphasizes systematic evaluation to determine tumor origin before definitive diagnosis and treatment.

The patient was diagnosed with acute hypertension during hospitalization, and vasomotor symptoms were not prominent. However, acute abdominal findings were the patient's most significant symptom.

In another clinical case with the same demographic characteristics as our case, liver metastases are frequently seen in NETs.Since Edmonson first reported primary hepatic neuroendocrine tumor (PHNET) in 1958, a total of 150 cases have been reported in the English literature and this number corresponds to approximately 0.3% of all NET cases (12). Carcinoid tumors most commonly metastasize to regional lymph nodes, liver, lung, bone and peritoneal cavity (12,13,14). Many patients present to the outpatient clinic with abdominal pain of unknown origin, fatigue, or incidental findings. In our patient, acute abdominal symptoms were the primary presenting symptoms; however, classic carcinoid findings, such as flushing, diarrhea, or bronchospasm, were absent. This clinical presentation can be explained by the literature, which indicates that hormonal symptoms are generally lacking in hepatic NETs due to the metabolism of vasoactive substances during the initial hepatic passage.

It is necessary to differentiate it from paraneoplastic syndromes or to determine the origin of this effect (15). Paraneoplastic syndromes are caused by factors such as adrenocorticotropic hormone and serotonin and vary depending on the biological activity of the tumor. Although the clinical findings are similar, the etiology is different (16). Endocrine and paraneoplastic findings can further complicate the clinical picture. Cases of paraneoplastic Cushing's syndrome due to ectopic adrenocorticotropic hormone (ACTH) secretion have been reported in gastrointestinal NETs (15). These syndromes can lead to severe metabolic and endocrine disorders that affect patient outcomes. Although these syndromes can mimic carcinoid features, their pathophysiologies are distinct and

require careful differentiation to guide appropriate treatment

The quality of life of cancer patients is affected not only by tumors and local malignancies but also by many symptoms. During abdominal surgeries, it is important to know the anatomy and to evaluate the adjacent organs in detail. Detection of incidental masses is an area that should be evaluated in case of detection of primary or metastatic lesions. Although imaging modalities can provide guidance, they should not be used alone.

Author contributions

We declare that all authors have accepted the submission and that the manuscript has not been published in whole or in part or submitted elsewhere.

Conflict of Interest: No conflict of interest was declared by the authors.

Table and Figures

Table 1. Classification for Neuroendocrine Neoplasms

Well-differentiated NETs	Ki-67 Index (%)	Mitotic Index
Grade 1	<3	<2/10HPF
Grade 2	3–20	2–20/10HPF
Grade 3	>20	>20/10HPF
Poorly-differentiated NECs		
Grade 3 (Neuroendocrine Carcinoma)	>20	>20/10HPF

Figure 1: Pathological image of liver neuroendocrine tumor

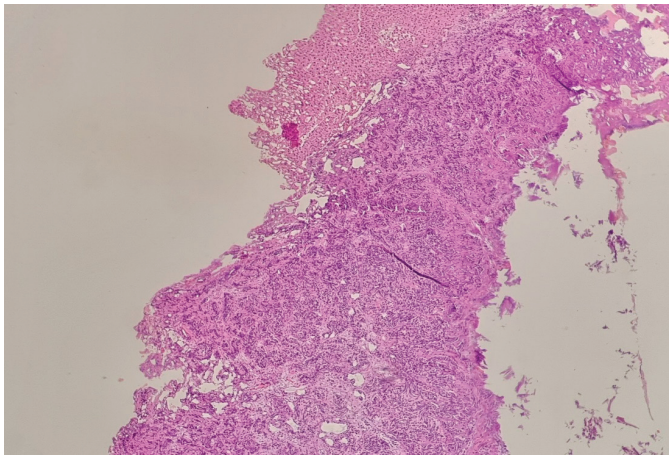

Figure 1 Liver Normal and Tumor Tissue H&E 40X

Figure 2: Neuroendocrine Tumor Cell

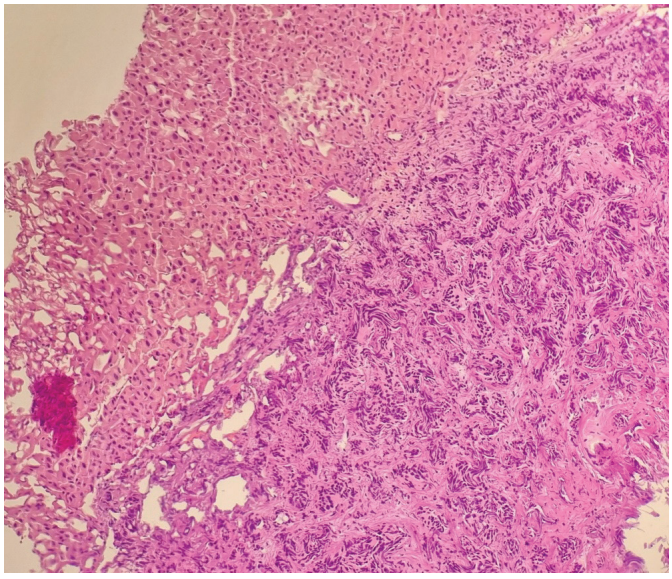

Figure 2 Islands consisting of oval and round cells and the trabeculae tumor with a crush artifact H&E 100X

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