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Case Report

# Neuroendocrine Carcinoma of the Stomach; A Case Report

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ABSTRACT

Gastric neuroendocrine carcinoma is a rare tumor which has a poor prognosis. Herein, we present a 55-year-old woman who presented with complaints of recurrent vomiting, hematemesis and weight loss. Endoscopic examination showed a large ulcerated mass in the antrum. Microscopic evaluation of the specimen taken through biopsy was compatible with a small round cell tumor. However, definitive histopathological diagnosis was made after surgical resection which revealed a neuroendocrine neoplasm immunohistochemically positive for Chromogranin A and Neuron specific enolase. As a result a diagnosis of neuroendocrine carcinoma of stomach was made for the patient.

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## Introduction

Neuroendocrine carcinoma of stomach is a rare neoplasm with poor prognosis and accounts for less than 1% of all gastric tumors.[1,2] They can be subclassified into 3 distinct groups: Type 1 is associated with chronic atrophic gastritis/pernicious anemia (70%-80%), Type 2 is associated with Zollinger-Ellison syndrome and multiple endocrine neoplasia type 1 and Type 3 comprise sporadic neuroendocrine tumors of the stomach (15%-20%).[3] Here, we describe a case of sporadic neuroendocrine carcinoma of the stomach whose exact pathological diagnosis was made after histopathological review of surgical specimens while biopsied material could not characterize the diagnosis.

## Case Presentation

A 55-year-old woman presented with a history of recurrent vomiting and hematemesis for 4-5 days and weight loss for the last 3 weeks. Hemogram was normal except for mild anemia. Computed tomography of the abdomen revealed an ill-defined soft tissue density in the gastric antrum measuring 7×5.6 cm with contiguous involvement of stomach and duodenum and obliterating fat planes between the lesion and gall bladder. Upper gastrointestinal endoscopy showed a large ulcerated mass in the antrum through which biopsy was performed and a small round cell tumor was found. A distal partial gastrectomy with gastrojejunostomy was performed. On gross examination, the specimen was measured to be 15 cm along greater curvature and 8cm along lesser curvature (figure 1 A and B). On cut section an ulcero-infiltrative tumor measuring 7×5 cm was identified in the gastric antrum along the lesser curvature.

Microscopically, the tumor was composed of round to cuboidal cells with vesicular nuclei and dispersed chromatin with tumor cells arranged in sheets forming nests at some places. The tumor was mitotically active with 6-7 mitoses/HPF and was penetrating serosa with vascular invasion. The resected margins, adjacent gastric mucosa and omental fat were histologically unremarkable.

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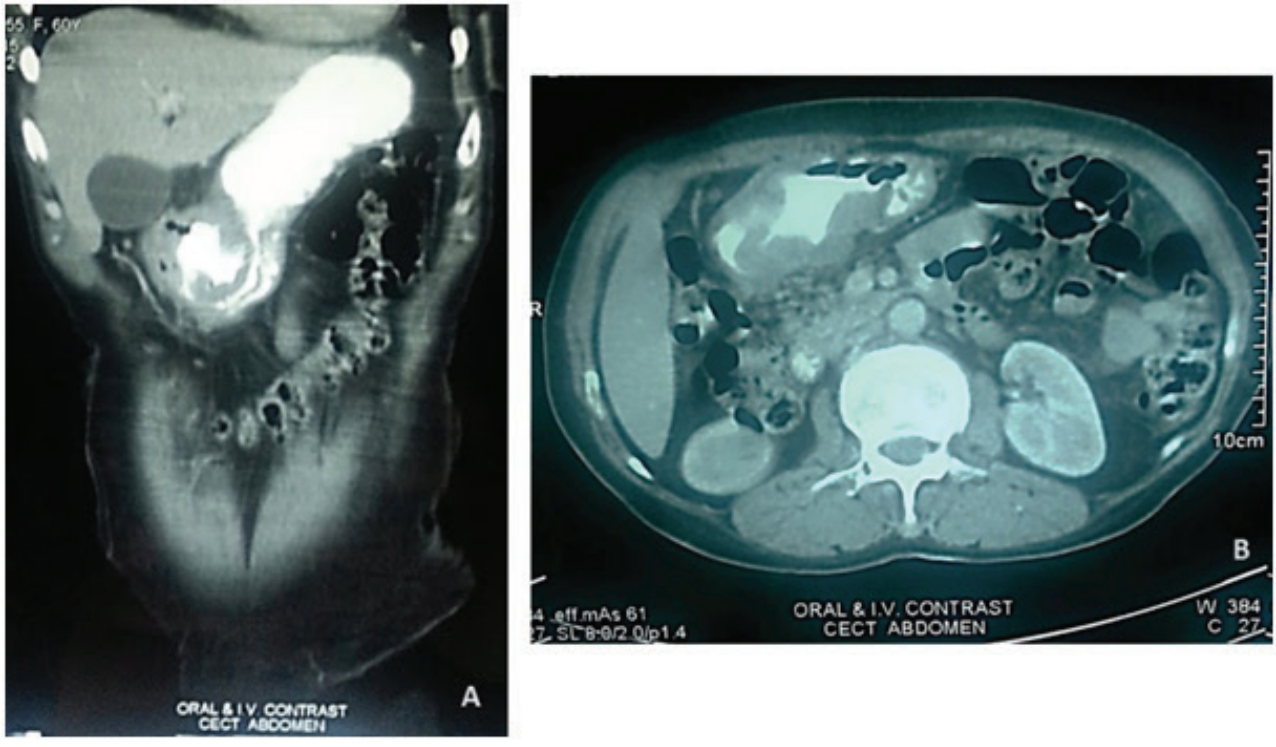



**Figure 1:** A&B) Contrast Enhanced Computed Tomography (CECT) of the abdomen. Well distended stomach showing circumferential thickening and mass within the gastric wall. There is peri-gastric fat infiltration and lymphadenopathy.

Out of the ten lymph nodes dissected out, four showed metastatic deposits of the tumor.

Immunohistochemically, the tumor cells were positive for Chromogranin A and neuron Specific Enolase (NSE) (figures 2 A-D). Based on histological tumor patterns, positivity for neuroendocrine markers and mitotic figures and according to recent WHO criteria, a diagnosis of neuroendocrine carcinoma of stomach Grade 3 was made. The post-operative period was uneventful and she was discharged on 10th post-operative day.

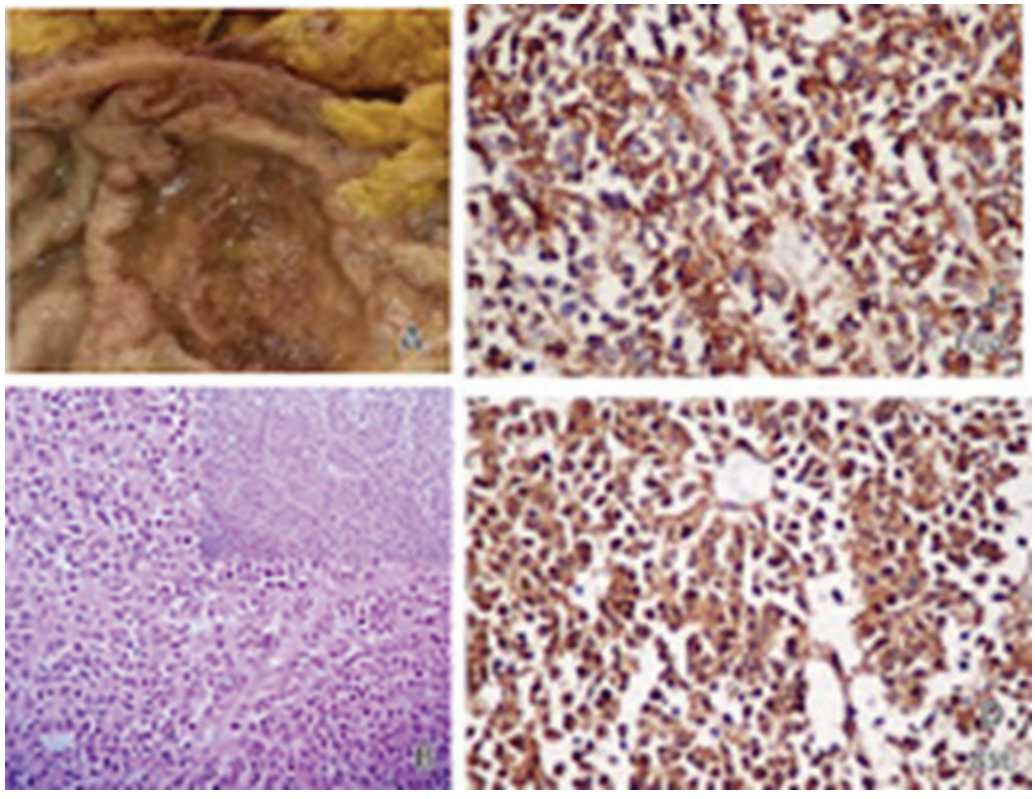


**Figure 2:** A) Gross photomicrograph of gastrectomy specimen showing a large ulcerated growth infiltrating in to serosa. B) (H&E 400×): Small to medium sized tumor cells with moderate to scant amount of cytoplasm. Coarse, salt-pepper chromatin with tumor cells arranged in sheets, trabeculae and rosettes (inset). C) (Chromogranin A; CGA): Tumor cells stained strongly positive for immunostain Chromogranin A. D) (Neuron specific Enolase; NSE): Tumor cells stained strongly positive for immunostain NSE.

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## Discussion

Gastric neuroendocrine neoplasms (NENs) comprise a group of tumors that exhibit a spectrum of histopathological variations, ranging from clearly benign tumors to highly malignant ones. NEN is an epithelial neoplasm with predominant neuroendocrine differentiation and is an uncommon tumor with multiple sites of occurrence.[4] Neoplasms may originate from any of the endocrine cells of the gastric wall, most commonly the enterochromaffin-like cells (ECL) of the oxyntic mucosa. Proliferation of these ECL cells could result in hyperplasia, dysplasia and neoplasia.[5] The first reports of tumors with the characteristics of gastrointestinal NETs can be traced in the medical literature of the late 19th century. Lubarsch (1888)[6] is credited with the first detailed description of such tumors in autopsy material while Ranson (1890)[7] described a patient with a tumor of the terminal ileum, hepatic metastases, diarrhea and postprandial exacerbation of dyspnoea. In 1907, Oberndorfer coined the term "carcinoid" (Karzinoid) to distinguish the more benign course of these rare tumors from that of the much commoner adenocarcinomas.[8] Askanazy reported the first two cases of gastric NET in 1923.[9] Christodoulopoulos and Klotz reported 79 cases of carcinoid tumor of stomach mainly diagnosed at autopsy.[10] Neuroendocrine carcinoma of stomach is a rare neoplasm with poor prognosis and accounts for less than 1% of all gastric tumors.[1,2] It occurs mostly in adults, has a prelidiction for females and is rare in children.[11]

Recently WHO classified the gastric neuroendocrine carcinoma to well differentiated neuroendocrine tumor, well differentiated carcinoma and poorly differentiated carcinoma based on the biological behavior, tumor size, tumor infiltration and angioinvasion.[12]

The proliferative rate of the tumor is assessed based on number of mitoses/10 HPF or the percentage of neoplastic cells immunolabelleling for Ki-67, a proliferative marker.[12] Also lymph node involvement is a significant predictor of survival, because the lymph node involvement is an important indicator in the Tumor Node Metastasis (TNM) staging of gastric NENs.[13] In present case, non-Hodgkin's lymphoma and poorly differentiated carcinoma were diagnosed on tumor specimen taken through endoscopic biopsy whereas subsequently a diagnosis of neuroendocrine carcinoma was made based on tumor patterns such as nesting, typical neuroendocrine chromatin and mitotic count of >50 mitoses/10HPF considering recent WHO criteria of neuroendocrine neoplasms.

Our diagnosis was further supported by positivity of tumor cells for chromogranin and NSE stains.

## Conclusion

Although a rare tumor, neuroendocrine carcinoma should be considered a potential diagnosis in endoscopic biopsies. An early diagnosis and appropriate treatment can be instituted before lymphatic spread and dissemination is supervened.

**Conflict of Interest:** None declared.

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