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Case Report

Surgery Section

# Polypoid Presentation of Neuroendocrine Tumour of Stomach: A Case Report

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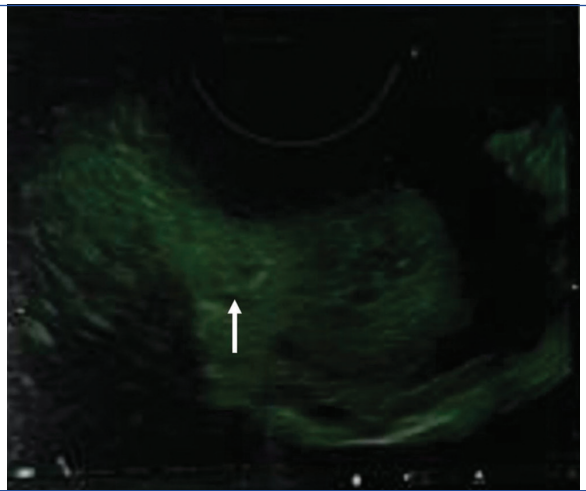
## ABSTRACT

Neuroendocrine Neoplasms (NENs) are rare epithelial tumours with neuroendocrine differentiation. We report a case of a 35-year-old female presenting with abdominal pain, haematemesis, and melena for four months. Clinical examination revealed generalised tenderness. Endoscopic Ultrasound (EUS) showed a well-defined, hyperechoic lesion in the third to fourth gastric wall layers, and Fine-Needle Aspiration Biopsy (FNAB) confirmed a well-differentiated Neuroendocrine Tumour (NET G2). Ga-68 DOTATATE Positron Emission Tomography-Computed Tomography (PET-CT) demonstrated a polyp on the posterior wall of the stomach with intense somatostatin receptor expression, localised to the gastric lesion with no evidence of distant metastasis. The patient underwent laparoscopic wide local excision with intraoperative endoscopic tumour localisation. Histopathology confirmed a well-differentiated NET. Gastric NETs, especially in young adults, are rare, and early multimodal diagnosis using imaging, histopathology, and molecular markers is crucial. This case underscores the importance of a multidisciplinary approach for effective management and the potential for positive outcomes in localised gastric NETs.


**Keywords:** Epithelial tumour, Haematemesis, Laparoscopy, Neoplasm

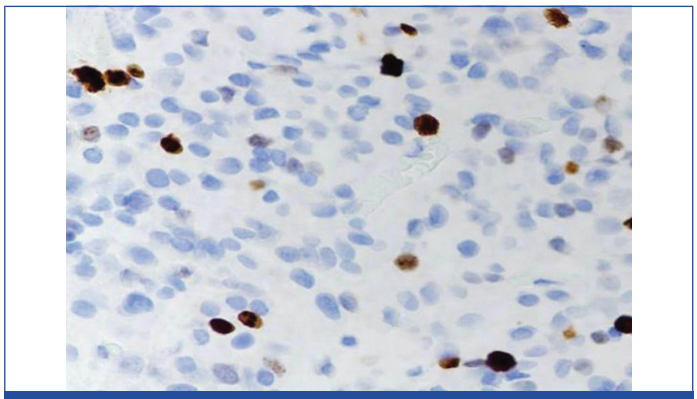
## CASE REPORT

A 35-year-old female, a homemaker by occupation, presented with abdominal pain, haematemesis, and melena for the past four months. On clinical examination, she had generalised abdominal tenderness. Laboratory investigations revealed significant anaemia, with a haemoglobin level of 6.5 g/dL (normal: 12.0-15.0 g/dL in females). An EUS was performed to characterise the finding further. It revealed a 13×13 mm homogeneous, hyperechoic lesion arising from the third to fourth layer of the stomach, with central umbilication and minimal vascularity [Table/Fig-1]. An FNAB was taken, which showed sheets of monotonous epithelial cells in a haemorrhagic background, with moderate cytoplasm, round nuclei, and indistinct nucleoli. These findings were suggestive of a well-differentiated NET. Immunohistochemistry (IHC) markers were positive for Cytokeratin (CK) AE1/AE3, synaptophysin, and Insulinoma-associated protein 1 (INSM1), with a Ki-67 proliferation index consistent with a well-differentiated NET, Grade 2/intermediate grade [Table/Fig-2]. Ga-68 DOTATATE PET-CT demonstrated a polyp on the posterior wall of the stomach with intense somatostatin receptor expression, confirming the diagnosis of a gastric NET [Table/Fig-3].

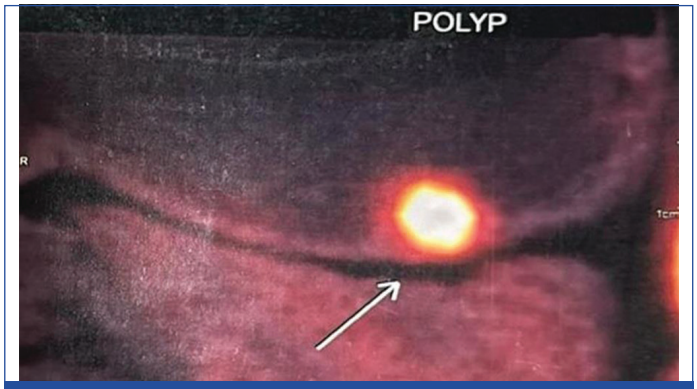


**[Table/Fig-1]:** Endoscopic ultrasound showing the lesion (indicated by white arrow).

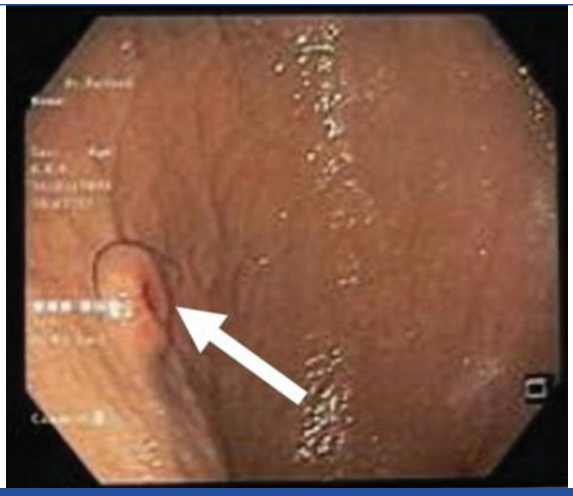
The patient was planned for diagnostic laparoscopy with possible partial gastrectomy under general anaesthesia. After port placement, the stomach was identified, and an intraoperative upper gastrointestinal endoscopy was performed to locate the tumour precisely [Table/Fig-4]. The lesion was stained with methylene blue to aid resection with appropriate margins. The tumour was identified along the posterior surface of the greater curvature in the pyloric antrum. A laparoscopic wide local excision of the tumour was performed, and the defect was sutured using V-LOC 2-0 [Table/Fig-5]. The excised tumour specimen [Table/Fig-6] was sent for Histopathological Evaluation (HPE). HPE results showed gastric mucosa with a circumscribed tumour primarily in the submucosa. Sheets of monotonous epithelial cells were observed [Table/Fig-7].



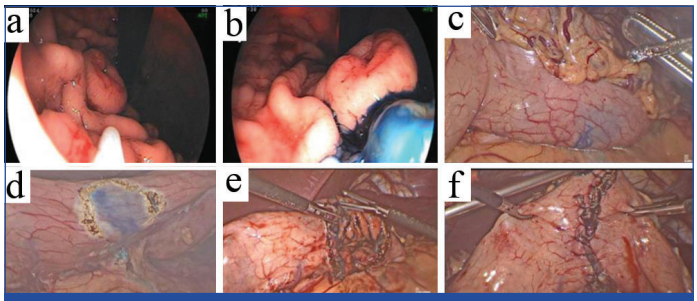
**[Table/Fig-2]:** Immunohistochemistry showing Ki67 proliferation index of 5%, consistent with a well-differentiated neuroendocrine tumour G2 (Nuclear stain, 400x).



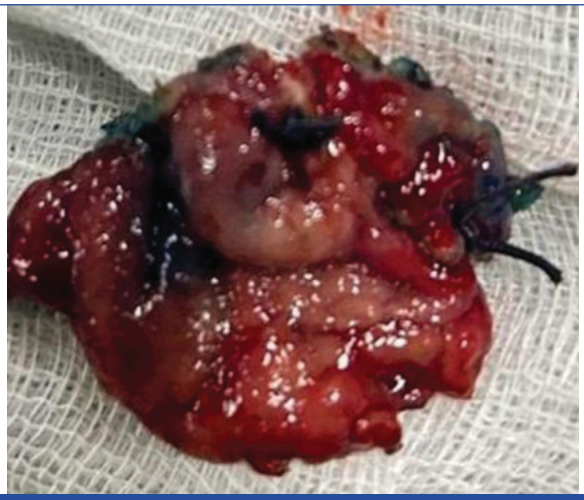

**[Table/Fig-3]:** Ga-68 DOTA scan showing polyp.



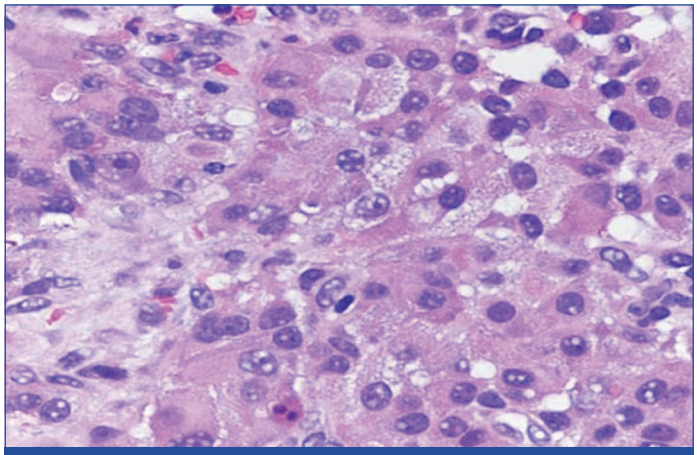
**[Table/Fig-4]:** Gastrointestinal endoscopy showing the polyp (white arrow).




**[Table/Fig-5]:** Laparoscopic guided excision. a) Tumour on Oesophago-Gastro-Duodenoscopy (OGDscopy); b) Staining the tumour with methylene blue dye; c) Stained tumour along with margins visible along the pylorus; d) Marking the margins of tumour for excision; e) Defect after excision of tumour; and f) Closure of the defect.



**[Table/Fig-6]:** Excised lesion.



**[Table/Fig-7]:** Histopathology of the excised specimen showing sheets of monotonous epithelial cells with moderate cytoplasm, round nuclear nuclei, and indistinct nucleoli.

The surgery was uneventful, and the patient was shifted to the postoperative room in stable condition. The patient was advised to have regular follow-ups for further management and surveillance.

## DISCUSSION

Neuroendocrine Neoplasms (NENs) are a heterogeneous group of epithelial neoplasms with predominant neuroendocrine differentiation [1]. Although rare, these tumours can arise in multiple anatomical sites with varied biological manifestations. NENs are commonly classified by their embryological origin into foregut (lung, bronchus, stomach, or duodenum), midgut (jejunum, ileum, appendix, or proximal colon), and hindgut (distal colon or rectum) tumours, with distributions of 34%, 30%, and 36%, respectively [2-5].

Gastric NENs are further categorised into NETs, NECs, mixed adeno-NEC, enterochromaffin cell tumours, serotonin-producing NETs, and gastrin-producing NETs [6]. NETs are subdivided into NET G1 (carcinoid tumours) and NET G2 (well-differentiated NETs/carcinomas), while NECs include NEC G3 (poorly differentiated NEC of small cell or large cell type) [7]. The classification of NENs into NETs or NECs is primarily based on cellular proliferation, including the mitotic count and Ki-67 index, which serve as critical markers for assessing tumour aggressiveness and prognosis [8]. Immunohistochemically, NENs are characterised by positive expression of synaptophysin and chromogranin A [9].

Gastric NENs are relatively rare, constituting less than 2% of all stomach cancers [10]. They are classified into three main types based on their pathophysiology and clinical behaviour [11]. Type I gastric NENs, which account for 70-80% of cases, are typically small, well-differentiated, and non-aggressive, with a low risk of metastasis [12]. They often occur in the setting of atrophic gastritis, autoimmune gastritis, or Helicobacter pylori infection [13,14]. Type II NENs, comprising 7-10% of cases, share similar characteristics with Type I but have a slightly higher metastatic potential and are frequently associated with Zollinger-Ellison Syndrome (ZES) and Multiple Endocrine Neoplasia type 1 (MEN1) [15]. Type III NENs, representing approximately 20% of cases, are usually larger (>2 cm), solitary tumours that can be well- or poorly differentiated [16]. These tumours tend to grow more rapidly and have a high metastatic risk, necessitating aggressive surgical management and, in some cases, systemic therapy.

In the presented case, the patient was diagnosed with a well-differentiated, intermediate-grade NET G2 based on histopathology and immunohistochemical findings. The tumour demonstrated positive expression of synaptophysin and INSM1, with a Ki-67 proliferation index consistent with an intermediate-grade NET. Maleki Z et al., have comprehensively reviewed the use of INSM1 as a novel and reliable biomarker for the diagnosis of NET [17]. Given the size of the lesion and location in the stomach, it was likely a Type III gastric NEN, which carries a higher risk of metastasis compared with Type I and II [12]. Chen X and Zhao H reported a case of well-differentiated Type III gastric NEN with liver metastasis [18]. Consequently, the patient underwent laparoscopic wide local excision, with intraoperative endoscopic guidance and methylene blue staining to ensure complete tumour removal. Kriger AG et al., have demonstrated that a combination of laparoscopy and gastroscopy can be an ideal option in removing the polyp and preserving organ function as well [19].

Although NETs may exhibit an indolent course, aggressive surgery and chemotherapy should be considered for NECs, especially poorly differentiated G3 NECs, which have a poor prognosis [11,20]. In this case, the patient's intermediate-grade tumour was managed surgically, and long-term follow-up with imaging and biomarker evaluation is crucial to monitor for recurrence or progression.

## CONCLUSION(S)

Gastric NETs are rare and require a multidisciplinary approach for accurate diagnosis and management. This case highlights

the importance of integrating imaging, endoscopic evaluation, histopathology, and IHC in diagnosing and classifying gastric NETs. Long-term surveillance is essential to monitor for recurrence or progression. Early identification and appropriate surgical intervention play a crucial role in optimising patient outcomes in gastric NENs.

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