A case report of primary gastric melanoma causing massive upper gastrointestinal bleeding in an adult

Azhar Perwaiz[1*], Sankar Narayanan[2], Rashi Sharma[3], Amanjeet Singh[4]

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ABSTRACT

Background: Melanomas involving the gastrointestinal (GI) tract are usually metastatic from primary cutaneous sites. Primary GI melanoma is a rare entity and mostly presents with non-specific symptoms. The diagnosis in most of the cases is made retrospectively on the immunohistochemistry findings.

Case Presentation: A 32-year-old male presented with massive upper GI bleeding necessitating a total gastrectomy, and to our surprise, on immunohistochemical staining, the diagnosis of primary gastric melanoma was confirmed.

Conclusion: The possibilities of rare mesenchymal tumors of the stomach should be considered while treating such patients. A high index of suspicion in such atypical scenarios should warrant a positron emission tomography integrated with computed tomography to complete the staging workup. The natural course of the disease and its outcome is not known due to the paucity and rarity of this entity. Although the prognosis is dismal, it would help to prognosticate the patient and family before embarking onto a major surgical resection.

Keywords: Melanoma, primary gastric melanoma, melanin, S100, immunohistochemistry.

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Correspondence to: Azhar Perwaiz
*Associate Director of Esophago Gastric Surgery, Division of GI Surgery, GI Oncology, Minimal Access, and Bariatric Surgery, Medanta The Medicity, Haryana, India.
Email: azharperwaiz@gmail.com
Full list of author information is available at the end of the article.

Background

Melanoma is an aggressive tumor and usually arise from the skin, eye, and meninges, where melanocytes are natural inhabitants. Melanocytes do not form a part of the natural cell lineage in gastrointestinal (GI) tract except for the anal canal, where the occurrence of melanoma is known. Melanomas involving the GI tract are largely metastatic [1]. Primary GI melanoma (PGIM) is very rare with a possible incidence of one case or less per million, of which primary gastric melanoma (PGM) accounts for around 12.7% only [2,3]. We are reporting a case of PGM in an adult presenting with massive upper GI (UGI) bleeding with the intent to review this rare entity.

Case Presentation

A 32-year-old male presented with a history of an episode of UGI bleeding for which he had received eight units of blood transfusion. On examination, he was pale and hemodynamically stable. Blood investigations were unremarkable except hemoglobin of 5.8 g/dl. He underwent three units of blood transfusion followed by an UGI endoscopy, which revealed a large submucosal mass in the fundus and body of the stomach with an area of ulcerations covered with clots. A biopsy was not considered safe due to the fear of re-bleed. Endoscopic ultrasound (EUS) was performed, which showed an extramucosal mass, and the possibility of a GI stromal tumor of the stomach was considered. A contrast-enhanced computed tomography (CT) of the abdomen and chest revealed an enhancing mass in the proximal stomach extending along both the lesser and greater curvatures. There was no regional lymphadenopathy or metastatic disease elsewhere (Figure 1). The next day, the patient was taken up for a laparotomy which revealed a 14-cm gastric mass extending from cardia up to proximal two-thirds of the stomach (Figure 2). There were no significantly enlarged peri-gastric nodes or gross omento-peritoneal disease. Total gastrectomy with Roux-en-Y esophagojejunostomy was performed. The cut section of the specimen showed that the stomach was filled with clots, and there was an extramucosal mass in the proximal stomach with ulceration. The patient's postoperative recovery was uneventful. The histopathology with immunohistochemistry (IHC) of tumor (Figure 3) was consistent with malignant gastric melanoma. The resection margins were negative, whereas four out of 36 nodes were positive. On follow-up at 2 weeks, a clinical history was reviewed to exclude the possibilities of skin melanoma, and the fundus examination was normal. Positron emission tomography (PET) integrated with CT (PET-CT) was performed to exclude other systemic focus to confirm the diagnosis of this case to be of PGM. Tumor board discussion qualified him for additional adjuvant therapy. At follow-up of 7 months, the patient is doing well.

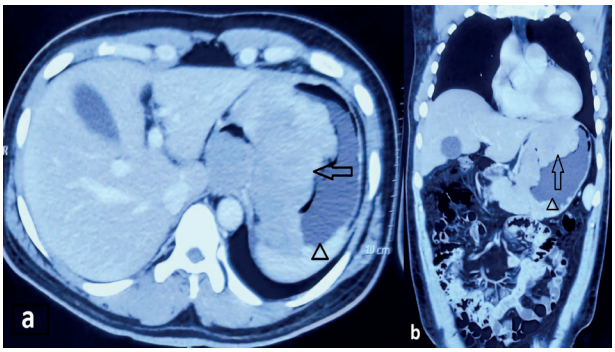

Figure 1. *Contrast-enhanced CT scan abdomen and chest (a-axial; b-coronal view) demonstrating mass in the proximal stomach extending along greater and lesser curvature (arrow) with hyperdense luminal content (arrow head) suggestive of recent bleed. Regional nodes are not enlarged. No evidence of liver or peritoneal metastases.*

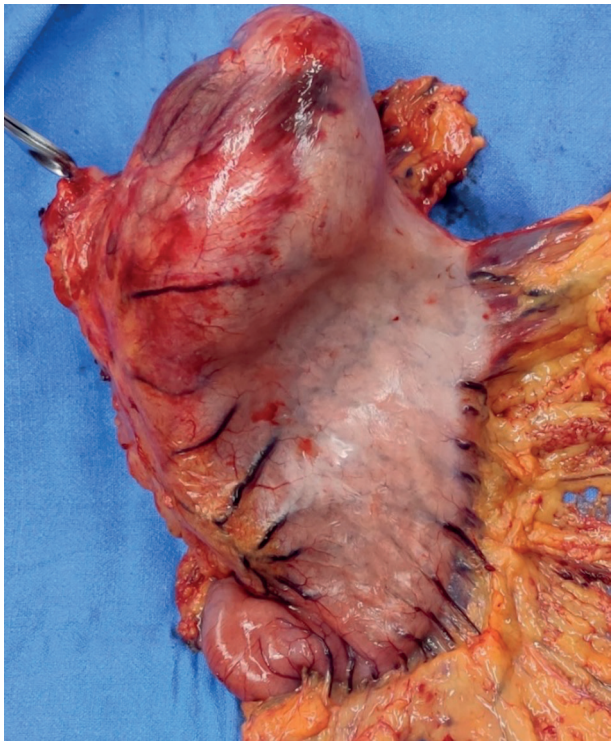

Figure 2. *Resected specimen showing a large mass involving the proximal stomach extending along lesser and greater curvature. No extraserosal extension. Few perigastric nodes were enlarged.*

Discussion

There are only 11 cases of PGM who have been reported so far [4,5], and the present case is possibly the 12th. Most of the patients with PGM have been males in the 6th or 7th decade of life, with tumor located in the proximal stomach (9 out of 12 in the fundus and body). The majority of them presented with non-specific symptoms such as generalized weakness, anemia, and weight loss. Presentation with massive GI bleeding like the current case is rare.

The theory behind the development of PGIM is largely speculative. Dedifferentiation of cells from amine precursor uptake and decarboxylation family leading to melanocyte transformation in the GIT [6] or melanocyte precursor migration from its native location [7] are the possible explanations.

UGI endoscopy is usually the first investigation, and three morphological patterns have been described for PGM, either a melanotic nodule, a mass lesion with melanosis, or submucosal mass with surface ulcerations giving bull's eye appearance [8]. At times, the lesion presents as ulcers or a mass without melanosis, where it is difficult to differentiate it from gastric malignancies [9]. Being an extra mucosal tumor, the possibilities of other common mesenchymal tumors of the stomach come as differential diagnosis, where a EUS is often useful, but the definitive EUS characteristics are not known which can differentiate a PGM from other stromal tumors of the stomach. A cross-section imaging such as CT or magnetic resonance imaging can help to identify the tumor and its loco-regional extent as lymphadenopathy is not uncommon in PGM; however, more relevant information is desired here to exclude the presence of extravisceral or systemic disease, where PET-CT may be helpful. The use of fluorine-18 fluorodeoxyglucose (FDG) PET has been investigated extensively for skin melanomas [10], which have been shown to help in early tumor detection, characterization, and extent of lesions and detection of recurrences with added benefits of monitoring treatment response following immunotherapy and mutation-driven treatments. However, its role in PGIM is not known due to the rarity of this clinical entity. Since this case was diagnosed retrospectively, FDG-PET was performed postoperatively to exclude primary skin or extraintestinal disease before labeling it as PGM.

The diagnosis of PGM is established by either an endoscopic biopsy with IHC or on the final histopathology after surgical resection of the specimen as was in this case. It showed the typical picture of a gastric wall lined by foveolar epithelium with submucosal sheets of pleomorphic cells composed of vesicular nuclei, prominent nucleoli, and moderate pale cytoplasm with intracytoplasmic coarse granular brown melanin pigment. On IHC, the neoplastic cells are positive for vimentin, melan A, and S100 (Figure 3).

Gastrectomy is an accepted treatment for PGM which is an independent predictor of outcome [3], but the overall survival even after complete removal is not satisfactory. The role of adjuvant therapy for PGM is not known. The use of Bacille Calmette-Guerin serum, levamisole, combination chemotherapy with dacarbazine [11], and interferon-alpha [12] have been explored to improve the outcomes in cutaneous melanoma. Based on these data, these agents have also been tried in PGM with moderate success. Recently, the National Comprehensive Cancer Network (version 2.2020) recommends the use of immunotherapy with vivolumab for cutaneous melanoma. It is programmed cell

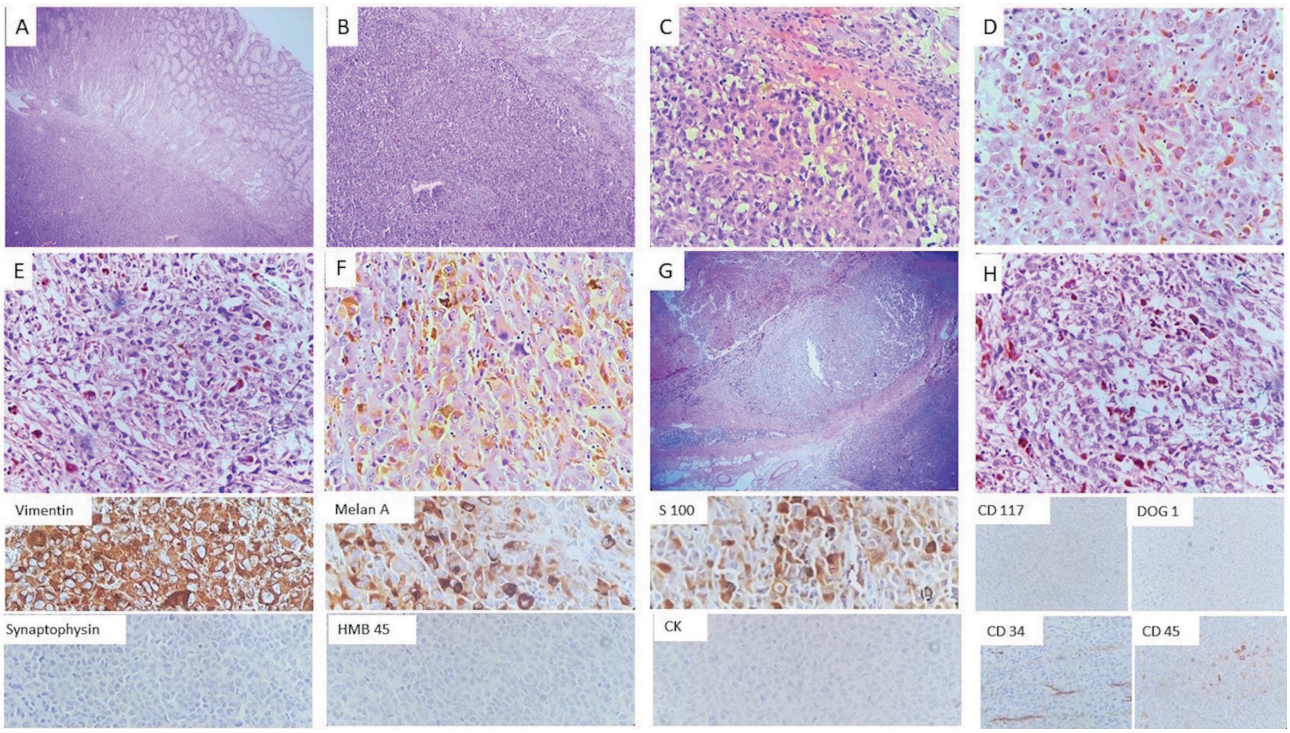

Figure 3. *Microscopic findings with IHC. A, B, and C: H and E stained slides show gastric wall lined by foveolar epithelium. The submucosa shows sheets of neoplastic cells arranged in sheets. D, E, and F: show sheets of moderately pleomorphic cells composed of vesicular nuclei, prominent nucleoli, and moderate pale cytoplasm with intracytoplasmic coarse granular brown melanin pigment. G and H: show lymph node infiltrated by neoplastic cells with similar morphology and intracytoplasmic melanin pigment. On IHC, the neoplastic cells are positive for vimentin, melan A, and S100 and negative for CD117, DOG1, CD34, synaptophysin, HMB 45, Cytokeratin, and CD45.*

death protein 1 and programmed death-ligand 1 inhibitor, which suppresses immune checkpoint proteins located on tumor cells surface and modulates tumor growth. Whether this strategy can effectively be applicable for PGIM, which is not validated yet but with limited available evidence and considering the young age of the patient with high-risk features, he was offered systemic vivolumab.

Conclusion

Melanoma irrespective of the site is an aggressive disease with a median survival of 12 months or less, and the majority of those with metastatic disease succumb early [13,14]. A high index of suspicion in such atypical scenarios should warrant a PET-CT to complete the staging workup. The natural course of the disease and its outcome is not known due to the paucity and rarity of this entity. The patient is possibly the youngest and the first to present with massive UGI bleeding, and at follow-up at 7 months, he is alive and free from disease recurrence or appearance of a new lesion.

What is new?

There are only 11 cases of PGM who have been reported so far, and this case is possibly the 12th. The patient in this case report was a 32-year-old male (young adult) in contrast to 6th and 7th decade age group in all other case reports. This case is possibly the youngest among reported in the literature and the first case of PGM presenting with massive UGI bleeding.

List of Abbreviations

CT	Computed tomography
EUS	Endoscopic ultrasound
FDG	Fluorine-18 fluorodeoxyglucose
GI	Gastrointestinal
IHC	Immunohistochemistry
PET-CT	Positron emission tomography integrated with CT
PGIM	Primary gastrointestinal melanoma
PGM	Primary gastric melanoma
UGI	Upper gastrointestinal

Consent for publication

Written informed consent was taken from the patient.

Ethical approval

Ethical approval is not required at the institution for publishing an anonymous case report.

Author details

Azhar Perwaiz[1], Sankar Narayanan[2], Rashi Sharma[3], Amanjeet Singh[4]

1. Associate Director of Esophago Gastric Surgery, Division of GI Surgery, GI Oncology, Minimal Access, and Bariatric Surgery, Medanta The Medicity, Haryana, India
2. Associate Consultant, Division of GI Surgery, GI Oncology, Minimal Access, and Bariatric Surgery, Medanta The Medicity, Haryana, India
3. Department of Histopathology, Medanta The Medicity, Gurgaon, Haryana, India
4. Director and Head of Colorectal Surgery, Division of GI Surgery, GI Oncology, Minimal Access, and Bariatric Surgery, Medanta The Medicity, Haryana, India

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Summary of the case

1	**Patient (gender, age)**	32-year-old male
2	**Final diagnosis**	Primary gastric melanoma
3	**Symptoms**	Massive upper gastrointestinal bleed
4	**Medications**	Vivolumab
5	**Clinical procedure**	Total gastrectomy with Roux-en-Y esophagojejunostomy
6	**Specialty**	GI oncology