Gastrointestinal stromal tumour (GIST) in a young man with unprovoked haematemesis

Vahe Shahnazarian, Laura Fazio

Ross University School of Medicine, North Brunswick, New Jersey, USA

Correspondence to
Vahe Shahnazarian,
vaheshahnazarian@gmail.com

SUMMARY

This case involves a 27-year-old Hispanic man who presented to the emergency department with two episodes of haematemesis with no other associated symptoms. In addition, he has no medical history, denies alcohol abuse, denies non-steroidal anti-inflammatory drug use and has never experienced these episodes before. Esophagogastroduodenoscopy evaluation showed a large gastric mass, and histological results obtained from several biopsies of the mass supported a diagnosis of gastrointestinal stromal tumour. His abdominal CT scan also supported this finding. However, the unprovoked haematemesis and young age of the patient does not fit the typical presentation of a gastrointestinal stromal tumour.

BACKGROUND

This case represents an interesting presentation to a diagnosis of gastrointestinal stromal tumour. The presentation of a 27-year-old man with two episodes of haematemesis with no associated symptoms and no significant medical history placed gastrointestinal stromal tumour (GIST) on our list of differential diagnoses; however, the uncommon presentation was not supportive of the diagnosis initially. This case underlines the importance of proper evaluation and diagnosis so as to not miss a potentially deadly disease in otherwise healthy individuals.

CASE PRESENTATION

A 27-year-old Hispanic man with a medical history of anaemia presented to the emergency department following two episodes of haematemesis, which occurred unprovoked upon waking up that same morning. He denies any prior episode of haematemesis or retching. The patient states that he has been fatigued for the last few months, but denies any feelings of dizziness or episodes of syncope. He denies fever, chills, weight loss, abdominal pain or diarrhoea. He denies recent changes in bowel habits and states that he maintains a good appetite. He denies alcohol, tobacco and illicit drug use as well as the use of non-steroidal anti-inflammatory drugs. He denies any family history of cancer, hypertension or diabetes. The patient recently emigrated from Mexico, within the last year. Regarding his anaemia, the patient states that he is noncompliant with taking his iron supplements. He is unaware of his baseline haemoglobin level.

On presentation, his temperature was 97.9°F, blood pressure was 129/79 mm Hg, heart rate was 95 bpm, and respiratory rate was 20/min. On physical examination, he appeared pale and fatigued. On abdominal examination, bowel sounds were

heard, he was tympanitic in all four quadrants, and his abdomen was soft, non-distended and non-tender to palpation. There was no organomegaly and no masses were palpated. The rest of his physical examination was within normal limits.

In the emergency department, the patient was transfused with two units of packed red blood cells to a haemoglobin of 8.3 g/dl. He was started on intravenous protonix and intravenous fluids while being kept non per os (NPO).

INVESTIGATIONS

A naso-gastric tube was placed and the lavage produced 200 cc of 'coffee ground' fluid. His laboratory studies included: white blood cell count 7.08 th/mm³, red blood count 3.12 mil/mm³, haemoglobin 6.2 g/dl, haematocrit 21.5%, mean corpuscular volume 68.9 mcm³ and platelet count 243 th/mm³. His ferritin was 1 ng/ml, serum iron was 13 µg/dl and total iron binding capacity was 333 µg/dl. All other labs, including his blood urea nitrogen (BUN) and creatinine, were normal. His chest x-ray showed no abnormalities.

DIFFERENTIAL DIAGNOSIS

A Mallory Weiss tear was on our list of differentials because the patient presented with haematemesis. However, the history obtained from the patient helped us to rule this differential out, as he denied retching or alcohol use. Leiomyoma, leiomyosarcoma and GIST were all on our list of differentials as well. An esophagogastroduodenoscopy (EGD) would allow us to visualise these masses if they were present.

OUTCOME AND FOLLOW-UP

The patient was upgraded to the intensive care unit for close monitoring while awaiting EGD, which was scheduled for the following day. The patient's EGD revealed a 5 cm ulcerated, exophytic, multi-lobed mass located in the proximal body of the stomach (noted in figures 1 and 2). The mass was very friable and bled on contact with the tip of the scope. Multiple biopsies were obtained for histopathology. The patient was continued on intravenous protonix therapy and serial complete blood counts (CBCs) were monitored. Recommendations for haematology/oncology and general surgery consults were made. A CT scan of the thorax, abdomen and pelvis with contrast was ordered to rule out distant metastases. It showed no evidence of intrathoracic metastatic disease, no intra-abdominal or retroperitoneal lymphadenopathy and a 5.5×2.2 cm gastric mass (noted in figures 3 and 4). The histopathology report showed a foci of GIST, spindle cell type, involving gastric submucosa and

To cite: Shahnazarian V, Fazio L. *BMJ Case Reports* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008018

Figure 1 Gastrointestinal stromal tumour, located in the proximal body of the stomach; note the ulceration.

mucosa. There was chronic, non-specific gastritis with focal activity and an increased number of intraepithelial lymphocytes, as may be seen with lymphocytic gastritis. Giemsa stain failed to reveal helicobacter pylori in the tissue. It was positive for CD117, CD34 and focally for smooth muscle actin (SMA); it was negative for desmin and S100. Ki67 labelling index was not elevated. There was only mild nuclear atypia and no mitotic activity or tumour necrosis was seen. CD8 immunostaining highlighted the intraepithelial lymphocytes.

His haemoglobin stabilised with two findings of 8.6 and 8.9 g/dl, not going below that for the rest of his admission. The haematology/oncology attending noted that the patient would not benefit from chemotherapy and that the tumour was fully resectable. The general surgeon agreed with that consultation and the patient was optimised for surgery. He was scheduled for a laparoscopic partial gastrectomy. The tumour was fully resected and he tolerated the procedure very well. He was discharged with no complications.

DISCUSSION

Gastrointestinal stromal tumours are tumours of the gastrointestinal tract composed of spindle cells, epithelioid cells and sometimes pleomorphic mesenchymal cells.¹ A majority of them

Figure 2 Gastrointestinal stromal tumour; a pedunculated mass with friable tissue.

Figure 3 Gastrointestinal stromal tumour on CT scan of the abdomen with contrast (shown at the tip of the white arrow).

express KIT, which is a stem cell factor receptor (CD117).^{1 2} They come about owing to a mutation in the KIT or PDGFRA genes—a very small percentage (9–15%) do not have a mutation in either gene, and they are known as ‘wild type’.² Both KIT and PDGFRA are on chromosome 4q12, and they both encode homologous transmembrane glycoproteins; these glycoproteins belong to a type 3 tyrosine kinase receptor family.³ These tumours usually occur in people over the age of 50, with a median of 55–65 years of age.¹ They are quite uncommon in patients under the age of 40.^{1 2} In fact, the incidence in patients 20–29 years of age has been reported to be 0.06/million/year.²

GISTs are usually found in the submucosa of the stomach, large intestine and small intestine. However, there are instances of GIST in the oesophagus, mesenteric adipose and greater omentum as well.¹ The majority are found in the stomach (approximately 60%), most being in the fundus.^{2 4} They can range in size from a few millimetres up to greater than 40 cm, with the mean size being 6 cm.¹ Clinically, the tumour usually remains ‘silent’ until it has progressed to a large size (approximately 6 cm).^{2 4} Symptoms are typically non-specific and include fatigue, abdominal pain, dyspepsia, weight loss, anorexia, nausea, obstruction and fever. However, the most common presentations include abdominal pain with or without gastrointestinal (GI) bleeding.^{2 4} Some present with chronic or acute GI bleeding or haemorrhage due to ulceration or rupture. Some patients will even present with a palpable mass.² That being said, only about 70% of patients with GISTs will develop

Figure 4 Gastrointestinal stromal tumour CT scan, showing dimensions (5.5 cm×2.2 cm).

Table 1 Risk assessment of gastrointestinal stromal tumour (National Institute of Health 2002)²

Risk category	Size (cm)	Mitotic count (50 HPF)
Very low risk	<2	<5
Low risk	2–5	5
Intermediate risk	5	6–10
	5–10	5
High risk	>5	>5
	>10	Any mitotic rate
	Any size	>10

HPF, high-power fields.

symptoms; the rest are diagnosed incidentally.⁴ Common modalities for diagnosis include imaging (such as CT scan), EGD and endoscopic ultrasonography—the mass can be biopsied and put through histopathological investigations. The majority of the tumours are positive for CD117/KIT (over 95% of them), although those findings are not an absolute requirement in diagnosis. GISTs usually also express CD34, nestin, SMA, caldesmon, calponin, vimentin and embryonic smooth muscle myosin.⁴ The findings of GIST in histopathology are KIT positive, DOG1 positive, desmin negative, SMA positive, h-Cal positive, S100 negative and CD34 positive.²

Prognosis depends on tumour size, mitotic rate and location of the tumour. Table 1 shows the risk stratification used to give the risk of malignancy and metastases of GIST.

In summary, a combination of smaller tumour size, lower mitotic rate of the tumour and a tumour located in the stomach, provide the best prognosis.^{1 2} Also, a recent study noted that if the specimen showed a higher index for Ki67, the tumour would evolve faster, indicating a poorer prognosis. Owing to this, Ki67 immunohistochemical evaluation should definitely be done prior to surgical resection or done to the resected specimen in order to help with overall prognostic stratification.⁵ Treatment revolves around surgical resection and the use of tyrosine kinase inhibitors. If the tumour is localised, surgical resection is the only curative measure. Lymph node dissection is generally unnecessary as the tumour does not typically metastasise to the nodes.^{2 6} Recently, a study reported that 127 patients who underwent tumour resection had a 5-year recurrence-free survival rate of 63%.² Patient with localised tumour may also

receive a year of postoperative imatinib therapy, which has been shown to improve the 1-year recurrence-free rate (98% vs 83% with placebo).² Some patients even receive imatinib therapy prior to resection in order to decrease tumour size.¹ In metastatic or unresectable disease, patients are generally first treated with imatinib; if patients still have progressive disease after the imatinib, then they are reassessed for surgical therapy. The timing of the surgical therapy, however, is very important; the optimal time is when the patient has achieved maximum benefit from the imatinib.²

Learning points

- ▶ Although the median age is 55–65 years of age, do not overlook a diagnosis of gastrointestinal stromal tumour (GIST) in a patient with suspicious symptoms.
- ▶ Early diagnosis with smaller tumour size at the time of diagnosis will provide patients with a better overall prognosis.
- ▶ It is more important to stratify the risk of a GIST as opposed to simply labelling it as benign or malignant.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- Beham AW, Schaefer I, Schuler P, *et al.* Gastrointestinal stromal tumors. *Int J Colorectal Dis* 2012;27:689–700.
- Zhao X, Yue C. Gastrointestinal stromal tumor. *J Gastrointest Oncol* 2012;3:189–208.
- Downs-Kelly E, Rubin BP. Gastrointestinal stromal tumors: molecular mechanisms and targeted therapies. *Patholog Res Int* 2011 April 14. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3090201/> (accessed 7 Nov 2012).
- Tan CB, Zhi W, Shahzad G, *et al.* Gastrointestinal stromal tumors: a review of case reports, diagnosis, treatment, and future directions. *ISRN Gastroenterol* 2012 April 12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3332214/> (accessed 7 Nov 2012).
- Neto RA, Logullo AF, Stavale JN, *et al.* Ki-67 expression score correlates to survival rate in gastrointestinal stromal tumors (GIST). *Acta Cir Bras* 2012;27:315–21.
- Linhares E, Goncalves R, Valadao M, *et al.* Gastrointestinal stromal tumor: analysis of 146 cases of the center of reference of the National Cancer Institute—INCA. *Rev Col Bras Cir* 2011;38:398–406.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow