Case Report

Gastrointestinal stromal tumor presenting with spontaneous tumor rupture and intratumoral hemorrhage: A rare encounter

Swapnil Sen[1], Nibedita Sen[2], Ishita Laha[3], Achintya Kumar Das[4]

From [1]RMO Cum Clinical Tutor, Department of General Surgery, Raiganj Government Medical College and Hospital, Raiganj, [2]Senior Resident, Department of Oncology, Howrah District Hospital, Howrah, [3]Post Graduate Trainee, [4]Professor, General Surgery, Vivekananda Institute of Medical Sciences, Kolkata, West Bengal, India

ABSTRACT

Gastrointestinal stromal tumors (GISTs) are typically benign tumors that most commonly occur along the GI tract. Most commonly, patients with these tumors present with GI bleeding, which may present as an acute bleed with melena or hematochezia. GISTs presenting with spontaneous tumor rupture and intratumoral hemorrhage leading to hemoperitoneum is an uncommon complication. We report an atypical presentation of a GIST presenting with tumor rupture and intratumoral hemorrhage in an 81-year-old gentleman, who presented with heaviness in the left side of the upper abdomen for the past 3 weeks associated with anorexia and fullness after meals. On clinical examination, an intra-abdominal intraperitoneal mobile lump was palpable in the left upper quadrant approximately 7.5 cm in diameter, firm in consistency, moving with respiration which spontaneously ruptured 2 days before the planned elective operation. Emergency exploratory laparotomy with wide local excision had to be undertaken.

Key words: Gastrointestinal stromal tumor, Imatinib, Intratumoral hemorrhage, Tumor rupture

Gastrointestinal stromal tumors (GISTs) are typically benign tumors that most commonly occur along the GI tract. While only comprising 0.1–3% of all GI malignancies, these tumors are the most common mesenchymal tumors of the GI tract [1]. Most GISTs remain "silent" until reaching a large size. Aggressive GISTs have a defined pattern of metastasis to the liver and throughout the abdomen or both [2]. Spreading to the lung and bone in advanced cases has been reported [3]. Metastasis often occurs 10–15 years after the initial surgery [2]. Most commonly, the patients with these tumors present with GI tract bleeding, which may present as an acute bleed with melena or hematochezia, or as chronic bleeding with associated anemia [4]. In addition to GI tract bleeding, GISTs may also present with signs and symptoms of a mass effect caused by the tumor such as abdominal pain or discomfort, early satiety, abdominal distension, or palpable mass. In an additional 15–30% of cases, GISTs are found incidentally on surgery, imaging, or autopsy [5]. Immunohistochemistry represents the basis for the diagnosis of GIST. The most common markers are c-KIT and discovered on GIST-1 (DOG 1). Approximately, 95% of the GISTs stain are positive for c-KIT. The remaining 5% are diagnosed on GIST 1 (DOG1), along with cluster of differentiation (CD) 34, which are considered diagnostic with the appropriate morphologic features [6].

Access this article online	
Received - 05 May 2021 Initial Review - 21 May 2021 Accepted - 26 May 2021	Quick Response code
DOI: 10.32677/IJCR.2021.v07.i06.004	

CASE REPORT

An 81-year-old gentleman presented with heaviness in the left side of the upper abdomen for the past 3 weeks associated with anorexia and fullness after meals for the same duration. There was no history of hematemesis, melena, or significant weight loss. The patient had a history of sudden onset pain abdomen 2 days before the day of elective operation, with hypotension.

On clinical examination, an intra-abdominal intraperitoneal mobile lump was palpable in the left upper quadrant approximately 7.5 cm in diameter, firm in consistency, moving with respiration. No visible peristalsis and no free fluid were clinically noted. No generalized or cervical lymphadenopathy was noted.

Blood investigations were haemoglobin-11 g/dl, total leukocyte count – 8900/mm^3, differential leukocyte count was neutrophil: 65%, lymphocyte: 27%, monocyte: 3%, eosinophil: 4% and basophil: 1%, platelet count: 200,000/mm^3, prothrombin time (PT) Test – 13 s, PT Control-11 s, and INR -1.18. Other tests such as liver function tests (alanine transaminase-56 IU/l, aspartate transaminase-82 IU/l, total bilirubin: 1.3 mg/dl, conjugated bilirubin: 0.6 mg/dl, and unconjugated bilirubin: 0.7 mg/dl),

Correspondence to: Dr. Nibedita Sen, Department of Oncology, Howrah District Hospital, Howrah, West Bengal, India. E-mail: nibedita.doctor@gmail.com

renal function tests (serum urea: 54 mg/dl, serum creatinine: 1.1 mg/dl), electrolytes levels (serum sodium: 135 meq/l, and serum potassium: 4.6 meq/l), and the chest skiagram were within normal limits. Serology-HIV, anti-hepatitis C virus, and HBsAg were non-reactive. Contrast-enhanced computed tomography (CECT) scan of the whole abdomen was suggestive of a large exophytic heterogeneously enhancing mass lesion arising from the greater curvature of the stomach with a small intraluminal component measuring approximately 12.6 cm × 9.5 cm × 11.2 cm displacing adjacent bowel loops (Fig. 1). CECT thorax was normal.

The patient was resuscitated and an emergency exploratory laparotomy was undertaken as he was hemodynamically unstable. The abdomen was opened by a standard midline incision. Large clots were evacuated. No peritoneal metastasis or lymphadenopathy was found. A ruptured exophytic lump was found originating from the greater curvature of the stomach adhered to the transverse colon. Wide local excision with a 5 cm margin on all sides with a cuff of the stomach was done after freeing the colon from the tumor mass. The stomach was closed in two layers. Hemostasis was secured. Thorough peritoneal toileting was done. The abdomen was closed in a single layer after the placement of the drain in the left paracolic gutter (Fig. 2). Two units of packed red blood cells were transfused which were started intraoperatively.

The histopathology report revealed a GI stromal tumor, spindle cell type, high-grade, and high-risk category, pT4Nx. Resection margins were free from tumor. Immunohistochemistry revealed the tumor cells were strongly and diffusely positive for CD117, DOG-1, and h-Caldesmon, focally positive for CD 34 and smooth muscle Actin; while they were negative for Desmin, S100 and cytokeratin.

The post-operative period was uneventful. Enteral nutrition was started after 2 days and the drain was removed after 3 days. Stitches were removed after 8 days. Postoperatively, the patient was started on Imatinib 400 mg once daily after 2 weeks of surgery. The patient was followed up after the 1st and 3rd months. He was doing well, with no significant complaints, normal appetite, regular bladder, and bowel habits. Complete hemogram, liver, and renal function tests, and CECT chest revealed no abnormality.

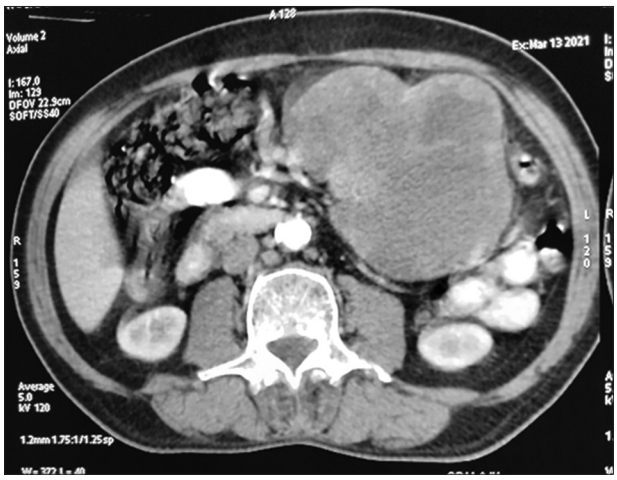

Figure 1: Computed tomography image showing a large exophytic heterogeneously enhancing mass lesion arising from the greater curvature of stomach with small intraluminal component measuring approximately 12.6 cm × 9.5 cm × 11.2 cm displacing adjacent bowel loops

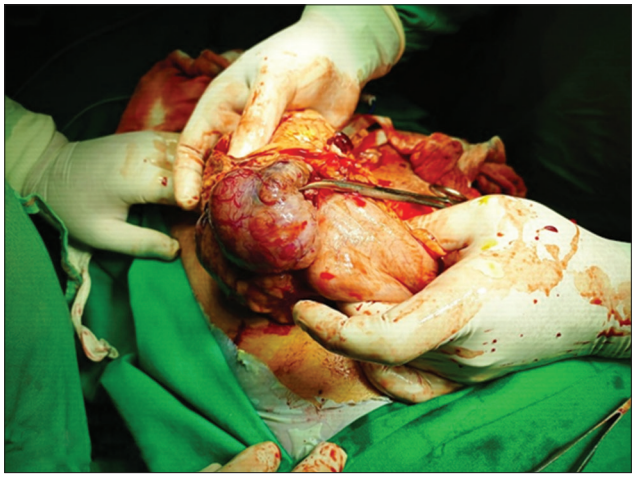

Figure 2: Intra-operative image of the tumor originating from the stomach and adherent to the colon

DISCUSSION

GIST is the most common mesenchymal neoplasm in the GI tract which originates from intestinal pacemaker cells known as the Interstitial cells of Cajal and has emerged from a poorly understood and treatment-resistant neoplasm to a well-defined tumor entity since the discovery of particular molecular abnormalities, *KIT*, and platelet-derived growth factor receptor-alpha (*PDGFR-α)* gene mutations. GIST mainly affects middle-aged to elderly adults, typically in their 60s [7] with no clear gender predilection. GISTs are uncommonly seen in patients younger than 40; however, cases in children and young adults have been reported.

Most GISTs contain gain-of-function, that is, oncogenic mutations in c-KIT or in PDGFR-alpha, which appears to be the major initiating event that drives the pathogenesis for GIST. Furthermore, mutations in either of these genes appear to be required for tumor growth and progression. This scenario can be thought of as "oncogenic addiction" and is one of the major reasons why some GISTs respond significantly to therapies that target these mutant receptors [8].

Like many other GI malignancies, the treatment of GISTs is largely dependent on the extent of the disease. The management of GISTs <2 cm may be monitored with endoscopic ultrasound [1]. For localized, resectable disease >2 cm, surgical resection is the treatment of choice. For patients with locally advanced disease, where it is thought that complete surgical resection is not attainable, pre-operative imatinib can be used to help reduce tumor burden before resection. For patients with high-risk disease, unresectable or metastatic disease, tyrosine kinase inhibitors preferentially imatinib is given. The patients should be monitored for response to medical therapy, most commonly with a CT scan [9].

Spontaneous rupture with hemoperitoneum is an uncommon complication of gastric GIST [10]. Pera *et al*. reported the first

case in 1999 in which an 83-year-old patient presented with intraperitoneal hemorrhage and hypovolemic shock [11]. The diagnosis of ruptured gastric GIST is often not considered at presentation and only disclosed by CT findings. Furthermore, the CT findings can sometimes mimic other pathologies, only to be revealed during exploratory laparotomy. Fiscon *et al*. reported a case of ruptured gastric GIST with hemoperitoneum that was initially reported as ruptured cavernous angioma of the liver on CT scan [12].

GIST should be considered when acute non-traumatic hemoperitoneum is present, particularly if a heterogeneous mass consisting of a necrotic cavity and high vascularity is detected on CT as described by Bucher *et al*. in a previously healthy 49-year-old man who presented with acute abdominal pain and severe hypotension [13]. Shively *et al*. reported a case of spontaneous hemoperitoneum due to the rupture of GIST in a 63-year-old female with a medical history of hypertension and ulcerative colitis who presented to the emergency department with worsening epigastric pain [14]. The differential diagnoses of GISTs include Leiomyoma, Leiomyosarcoma, Lymphoma, Metastatic Melanoma, and Schwannoma. Immunohistochemistry helps in differentiating GISTs from these lesions.

CONCLUSION

The rapid expansion of molecular and clinicopathological knowledge of GIST has given this disease a promising future. The molecular targets for therapeutic interventions are of importance for the treatment of GIST patients and also help in the development of novel drugs for targeted therapy. For treatment selection and assessment of the disease progression, molecular testing of GISTs should be performed. Spontaneous rupture of GIST, although rare, has been reported in the literature. Therefore, a high index of suspicion should be there while planning elective surgery as patients may present with life-threatening hemorrhage and hemodynamic instability which may need urgent surgical intervention.

REFERENCES

1. El-Menyar A, Mekkodathil A, Al-Thani H. Diagnosis and management of gastrointestinal stromal tumors: An up-to-date literature review. J Cancer Res Ther 2017;13:889-900.
2. DeMatteo RP, Lewis JJ, Leung D, Mudan SS, Woodruff JM, Brennan MF. Two hundred gastrointestinal stromal tumors: Recurrence patterns and prognostic factors for survival. Ann Surg 2000;231:51-8.
3. Miettinen M, Furlong M, Sarlomo-Rikala M, Burke A, Sobin LH, Lasota J. Gastrointestinal stromal tumors, intramural leiomyomas, and leiomyosarcomas in the rectum and anus: A clinicopathologic, immunohistochemical, and molecular genetic study of 144 cases. Am J Surg Pathol 2001;25:1121-33.
4. Ueyama T, Guo KJ, Hashimoto H, Daimaru Y, Enjoji M. A clinicopathologic and immunohistochemical study of gastrointestinal stromal tumors. Cancer 1992;69:947-55.
5. Joensuu H, Hohenberger P, Corless CL. Gastrointestinal stromal tumor. Lancet 2013;382:973-83.
6. Nishida T, Blay JY, Hirota S, Kitagawa Y, Kang YK. The standard diagnosis, treatment, and follow-up of gastrointestinal stromal tumors based on guidelines. Gastric Cancer 2016;19:3-14.
7. Nilsson B, Bumming P, Meis-Kindblom JM, Odén A, Dortok A, Gustavsson B, *et al*. Gastrointestinal stromal tumors: The incidence, prevalence, clinical course, and prognostication in the preimatinib mesylate era--a population-based study in Western Sweden. Cancer 2005;103:821-9.
8. Tarn C, Godwin AK. The molecular pathogenesis of gastrointestinal stromal tumors. Clin Colorectal Cancer 2006;6:S7-17.
9. Burch J, Ahmad I. Gastrointestinal stromal cancer. In: StatPearls. Treasure Island, FL: StatPearls Publishing; 2021.
10. Bae JM, Kim SW. Hemoperitoneum due to ruptured gastric gastrointestinal stromal tumor. Korean J Gastroenterol 2009;54:123-5.
11. Pera M, Sáenz A, Fernández-Cruz L. Hemoperitoneum due to a ruptured gastric stromal tumor. Dig Surg 1999;16:248-9.
12. Fiscon V, Portale G, Isoardi R, Frigo F, Migliorini G. Spontaneous rupture of giant gastric GIST presenting as hemoperitoneum and mimicking cavernous liver angioma. Tumori 2009;95:233-5.
13. Bucher P, Poletti PA, Myit S, Morel P. Spontaneous rupture of a gastrointestinal stromal tumour associated with life-threatening nontraumatic hemoperitoneum. Can J Surg 2008;51:E38-9.
14. Shively J, Ebersbacher C, Walsh WT, Allemang MT. Spontaneous hemoperitoneum from a ruptured gastrointestinal stromal tumor. Cureus 2020;12:e9338.

Funding: None; Conflicts of Interest: None Stated.

How to cite this article: Sen S, Sen N, Laha I, Das AK. Gastrointestinal stromal tumor presenting with spontaneous tumor rupture and intratumoral hemorrhage: A rare encounter. Indian J Case Reports. 2021;7(6):232-234.