

# Intramural gastric hematoma imitating a gastrointestinal stromal tumor – case report and literature review

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## SUBSTRACT:

The article presents a case report of a patient with an intramural gastric hematoma. Diagnostic examinations were suggestive of a suspected gastrointestinal stromal tumor. Normal image was observed in gastroscopic examination while abdominal CT scan revealed a nodular lesion along the greater curvature of the stomach extending from the posterior wall and adjoining the pancreas and the spleen. The patient was qualified for surgical treatment. Laparotomy was performed followed by total gastric resection and Roux-en-Y reconstruction of the gastrointestinal tract. Post-operative histopathological examination revealed the presence of an extensive hematoma penetrating the perigastric fat tissue along with numerous hemosiderinophages and segmental indicators of formation of inflammatory granulation tissue suggestive of a chronic nature of the lesion. Immunohistochemical GIST assays (CD117, DOG-1, CD34, CD31, SMA, S-100, CKAE1/AE3, Ki-67) were negative. No complications were observed in the post-operative course. Patient is subject to continued follow-up and observation. Follow-up gastroscopy and abdominal CT scan performed 6 months after the surgery revealed an unremarkable image.

## KEYWORDS:

Intramural gastric hematoma, gastrointestinal stromal tumor, total gastric resection

## INTRODUCTION

Gastrointestinal stromal tumors (GIST) are the most common mesenchymal tumors of the gastrointestinal tract [1,2]. They are located mainly within the stomach (60-70% of cases) and the small intestine (25-30% of cases) or, much less commonly, within the esophagus (<5% of cases), colon (1% of cases) and rectum (5% of cases) [1,2,3]. GISTs are particularly rare within the omentum, mesentery, or retroperitoneal space. In addition, in rare cases the primary location cannot be determined due to multifocal intraperitoneal spread of the tumor [2,3]. Gastric location of the tumor is associated with better prognoses than in the case of other organ locations [1]. GISTs account for about 0.1-3% of gastrointestinal cancers [1]. The estimated incidence in Poland is about 120-190 of new cases each year [2]. The tumors are diagnosed as submucosal, intramural, or subserosal [3]. Due to the tumor location, the available diagnostic methods are not always sufficient for diagnosing GIST with the diagnosis being commonly made only on the basis of histopathological examinations of surgical specimens.

Intramural gastric tumors may be of non-cancer nature. These include ectopic foci of pancreatic tissue, vascular malformations, abscesses, intramural hematomas, and other lesions.

The article presents a case report of a patient in whom an intramural gastric hematoma imitated a gastrointestinal stromal tumor. Several case reports on patients with similar conditions can be found in the literature. Intramural gastric hematomas are most commonly observed in patients with gastric and duodenal ulcers, chronic pancreatitis, or hematological disorders, patients on chronic oral anticoagulation treatment, patients after endoscopic examination of upper gastrointestinal tract, patients after intra-abdominal trauma or rupture of an aneurysm within the visceral arteries that supply blood to the stomach [4,5]. Usually, they are

diagnosed in post-surgical histopathological examinations since the imaging techniques are characterized by poor specificity and sensitivity for detection of these lesions.

Intramural gastric tumors are a diagnostic conundrum with the final solution being provided only by histopathological examination. Panels of immunohistochemical assays are often required for final diagnosis. The case described herein illustrates the need for comprehensive assessment and rare hematomas being taken into consideration in differential diagnostics of intramural gastric tumors.

## CASE REPORT

A male patient, aged 26, was admitted to a regional hospital due to acute pain within the lower abdomen. During hospitalization, the patient was subjected to gastroscopy that revealed an unremarkable presentation of gastric mucosa. Abdominal CT scan revealed an extensive, perimural, nodular mass located within the entire gastric body along the greater curvature. The lesion was characterized by thickness of up to 61 mm and density on the order of 56-77 HU, not subject to significant contrast enhancement; it extended downward along the pancreatic tail to the transverse colon level. Suspicion of GIST was made on the basis of the imaging studies and physicians' assessment and the patient was discharged home with referral for further treatment at the Cancer Center.

Upon admission to the 1<sup>st</sup> Department of Oncological and General Surgery of the Greater Poland Cancer Center, the patient reported no complaints of any kind. The patient had not been hitherto treated for any chronic diseases and had not received any continuous medication. The family history of cancer was negative. No significant abnormalities were revealed in physical examination. Abdominal CT scan was reassessed by radiologists who confir-

med the diagnosis of GIST. After completion of diagnostic examinations, the patient was finally qualified for surgical treatment. After laparotomy, a tumor of cyst-like structure and ca. 8 cm in diameter was revealed protruding from the posterior stomach wall. No metastatic lesions were observed in other organs upon intraoperative assessment. Perigastric lymph nodes were not enlarged upon macroscopic inspection. The lesion covered the entire posterior wall of the stomach extending from the antrum to the pylorus. The tumor adjoined the anterior pancreatic wall. Due to the extent of the lesion, a decision to perform total stomach resection was made intraoperatively due to the impossibility of partial or wedge resection. Gastrointestinal tract was reconstructed by means of Roux-en-Y anastomosis. No complications were observed in the post-operative course. The patient was discharged home in good general condition and without any complaints on day 11 after the surgery.

Post-operative macroscopic histopathological examination revealed a hemorrhagic lesion sized 9x5x4,8 cm, extending within the posterior stomach wall along the greater curvature, with unchanged gastric mucosa above the lesion along with an erosion, ca. 0,2 cm in size, within the pyloric region (Figure 1). Microscopic examination revealed the presence of rodent hemorrhagic changes reaching down to the lamina muscularis propria, and extending into an extensive hematoma penetrating the perigastric fat tissue along with numerous hemosiderinophages and segmental indicators of formation of inflammatory granulation tissue suggestive of a chronic nature of the lesion (Figure 2). Immunohistochemical assays (CD117, DOG-1, CD34, CD31, SMA, S-100, CKAE1/AE3, Ki-67) precluded the presence of a GIST-type lesion.

The patient is subject to continued care in the Oncological Surgery Outpatient Clinic where he attends follow-up visits. In January 2016, a follow-up gastroscopic examination was performed to reveal unremarkable presentation of gastroesophageal anastomosis and an abdominal CT scan was acquired also to produce an unremarkable image.

## DISCUSSION

Most common intramural gastric lesions include stromal tumors that may present clinically as benign (70%) or malignant tumors (30%) [6]. Benign lesions are usually diagnosed incidentally upon endoscopic or radiological examinations or intraoperatively during surgical procedures. Numerous methods are employed in preoperative diagnostics of lesions suspected of GIST nature, including gastrointestinal endoscopy, endoscopic ultrasound (EUS), abdominal ultrasound scan, abdominal and pelvic CT scan, and, sometimes visceral angiography [2]. Diagnostic difficulties encountered in GIST cases are due to the specific morphological features of the neoplastic tumor including submucosal and non-infiltrative growth, exophytic location relative to the gastrointestinal tract lumen, poor connection to the organ of origin and the presence of a cyst-like component [7]. In case of suspected GIST lesions, thin-needle biopsy may be collected under EUS control or open biopsy may be performed upon laparotomy, preferably with a part of the freshly collected material being retained and frozen for potential molecular tests [2]. Due to the submucosal growth of the tumor and the lack of the endophytic component of ingress to the gastrointestinal lumen,



Fig. 1. Macroscopic image of the stomach with hematoma after resection

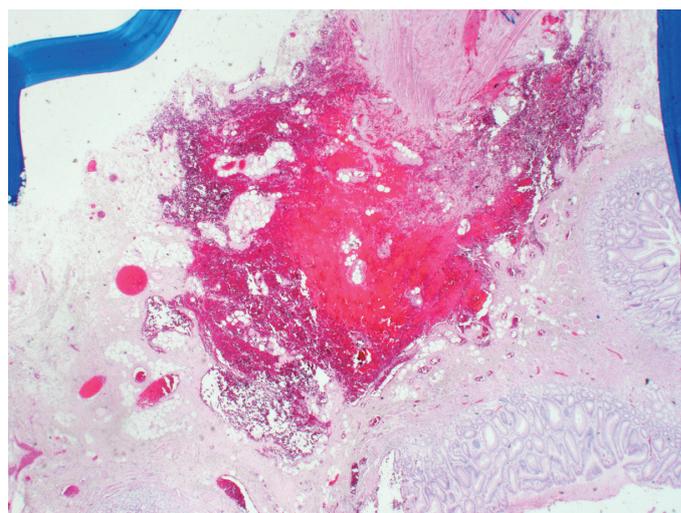


Fig. 2. Microscopic image of the hematoma – H+E staining

histopathological confirmation is usually difficult in the case of endoscopic biopsy which precludes the collection of a sufficiently deep material using the standard biopsy forceps. The mucosa above the tumor is usually unremarkable, sometimes umbilicated; mucosal ulceration may be present in the case of extensive lesions. According to some authors in cases of suspected GIST the material should be collected from deep inside the ulcer rather than from its perimeter as is usually done since in contrast to gastric cancer, mucosal ulceration in the course of GIST is non-cancerous in nature [7]. BAC facilitates preoperative diagnosis of GIST in 80-90% of lesions. It is an efficient and safe diagnostic tool provided that a sufficient amount of material is collected in a proper manner. One should keep in mind that the biopsy specimen should be collected from the peripheral, solid part of the tumor. The material collected from the central part of the tumor may be non-diagnostic as it undergoes necrotic and regressive changes and may not contain living cancer cells [7]. In abdominal ultrasound scans, GISTs present as hypochole-

nic lesions, with small lesions being of homogeneous and large tumors being of more heterogeneous echogenicity. In abdominal CT, GISTs present as contrast-enhanced cystic or cystic/solid lesions. In the reported case no biopsy was performed upon gastroscopic examination a no changes were observed within the gastric mucosa.

Intramural hematomas within the gastrointestinal tract are non-cancerous lesions that are mostly located within the esophagus of the duodenum [4,5]. Hematomas of an extent limited to stomach only are very rare. By the year 2010, as few as 33 cases were reported [8]. The first well-documented case of a patient with an intramural gastrointestinal hematoma was described by MacLachlan in 1838 [9]. In 1904, Sutherland reported a case of a patient suffering from Schönlein-Henoch purpura in whom an intramural hematoma became a cause of gastrointestinal tract obstruction [9]. Intramural hematomas develop due to the broken continuity of terminal arteries at points of penetration of the lamina perivascular of the alimentary tract. They are more common in male patients [9]. The mean age of patients presenting with these lesions is 38 years [8]. Most commonly, the lesions are located within the stomach body and less commonly within the antrum or pylorus region. Hematomas covering the entire stomach were observed only in 4,5% of cases [10]. The dimensions of the lesions were not reported in 45% of cases; in 22% of the documented cases, the diameter of lesions was larger than 10 cm [10]. Also in the case reported herein, the largest dimension of the lesion was larger than 9 cm. Usually, intramural hematomas are asymptomatic and very rarely cause any complaints such as nausea, blood-stained vomit or epigastric pain. In addition, hematomas may impact the osmotic gradient within the gastrointestinal tract wall leading to hemorrhagic effusion into the peritoneal cavity [5]. Intramural gastric tumors are observed mainly in patients with hematological disorders, particularly in patients with hemophilia or von Willebrand disease. Cases of intramural gastric hematomas in patients chronically medicated with oral anticoagulants (i.e. Warfarin or acenocoumarol) can also be encountered in the literature [8,11]. Intramural gastric hematomas are less common in patients with stomach ulcer disease, duodenal ulcer disease, or chronic pancreatitis, as well as presenting as complications following endoscopic examinations of upper gastrointestinal tract, rupture of an aneurysm in stomach-supplying arteries, rupture of splenic tunica and parenchyma, or following ingestion of a foreign body that damaged the wall of the stomach [12-17]. No cause of the hematoma was provided in 3 of the reported cases [8,18]. Most intramural hematomas are self-restrained in nature and are

reabsorbed within 2-3 weeks. Computed tomography scans are considered to be the most specific and sensitive in diagnosing intramural hematomas [4]. In CT scans, hematomas are described as well-defined, hyperdense masses that do not infiltrate the adjoining structures. In addition, no calcifications characteristic for cancer lesions can be observed in the scans. Angio-CT is also used in the diagnostics for detection of active hemorrhage or for detection of visceral arterial aneurysms in the vicinity of the stomach. In case of an active hemorrhage, angiography facilitates initiation of treatment, i.e. embolization of the damaged vessels [10]. Endoscopic ultrasonography that facilitates determination of the thickness of the wall from which the lesion originates is a useful diagnostic tool. In addition, the technique facilitates the assessment of lesion's echostructure and the thickness of the infiltration as well as permits the physician to perform thin-needle or core-needle biopsy to collect the material for cytological and histopathological analyses [8]. Transabdominal ultrasound scanning is characterized by poor specificity in the detection of gastric cancer as it presents an isoechogetic or hypoechogetic mass that may imitate gastric cancer or inflammatory lesions [4]. There are no therapeutic guidelines for the management of intramural gastric hematomas. Conservative treatment was applied in 64% of the reported cases while surgical procedures were performed in the remaining cases [8]. Conservative treatment was used mainly in patients with hematological disorders. The treatment consisted of administration of clotting factors and blood transfusion [4,8]. Surgical treatment was performed in case of hematomas involving a large part of gastric wall or significantly increasing in size; this included evacuation of hematoma via transdermal incision under ultrasound monitoring or during laparotomy as well as partial or total resection of stomach. Surgical treatment is the treatment of choice in cases difficult to differentiate from other gastric tumors. In the reported case, surgical treatment was taken up due to the size of the lesion, the destruction of the entire gastric wall and the impossibility to obtain a preoperative histopathological diagnosis.

To conclude, it should be noted that despite the broad accessibility of numerous diagnostic methods, intramural lesions within the gastrointestinal tract remain a significant interdisciplinary diagnostic and therapeutic problem. Differential diagnostics of intramural gastric tumors should include the rarely encountered hematomas. Besides the final diagnosis, exclusion of neoplastic changes concomitant with intramural hematomas is also of utmost importance [19,20]. Depending on their origin and extent, the treatment of isolated intramural hematomas involves conservative management or surgical procedures.

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