

# Duodenal gastrointestinal stromal tumor: clinical case report

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## Abstract

Gastrointestinal stromal tumors (GIST) are mostly located in the stomach, small intestine, colorectal, and rarely in the duodenum. We report a rare case of duodenal GIST in a 48-year-old female patient identified with computed tomography scan (CT scan), esophagogastroduodenoscopy, and confirmed by histopathology examinations.

*Keywords:* Gastrointestinal stromal tumor, GIST, Duodenal Tumor.

## Introduction

GIST are common mesenchymal tumors of the gastrointestinal tract. GIST are mostly located in the stomach (60%), followed by the small intestine (35%), rectum, esophagus, and mesentery. Notably, only 1-5% GIST occurs in the duodenum.[1] The clinical symptoms of GIST are nonspecific with some manifestations such as upper gastrointestinal bleeding (42%), abdominal pain (20%), and intestinal obstruction (10%). However, GIST may be asymptomatic and discovered accidentally in about 20%. [2] On CT scan, small GIST are moderately infiltrated medicine and uniform, calcification in the tumor is less common. In contrast, large tumors tend to have central necrosis and heterogeneously medical infiltrate.[3] The definitive GIST treatment is surgery.

## Clinical case

A female patient 48 years old was admitted to the hospital on 26/7/2021 (medical record code 33263) due to back pain, no abdominal pain, no

gastrointestinal symptoms, and no previous medical history. Clinical examination: soft abdomen, abdominal mass is not palpable. The patient has undergone CT scan with a contrast injector: The tumor was located in the posterior wall of the duodenum descending part which is about 35x36mm in size, with a protrusion into the duodenal lumen, density equal to pre-injection, strong contrast-enhanced phase in the periphery, central partly reduces in density and non-contrast enhancement in necrosis form. (Figure 1A). The tumor was supplied with blood from a gastroduodenal artery and had an indistinct boundary between the head of the pancreas and the inferior vena cava (Figure 1B-F).

The patient has undergone esophagus – stomach – duodenum endoscopic that detected at the position of superior duodenal flexure has 01 a protrusion into the lumen about 12mm in size, concave and ulceration in the middle, is biopsied into this location. (Figure 2A-B)

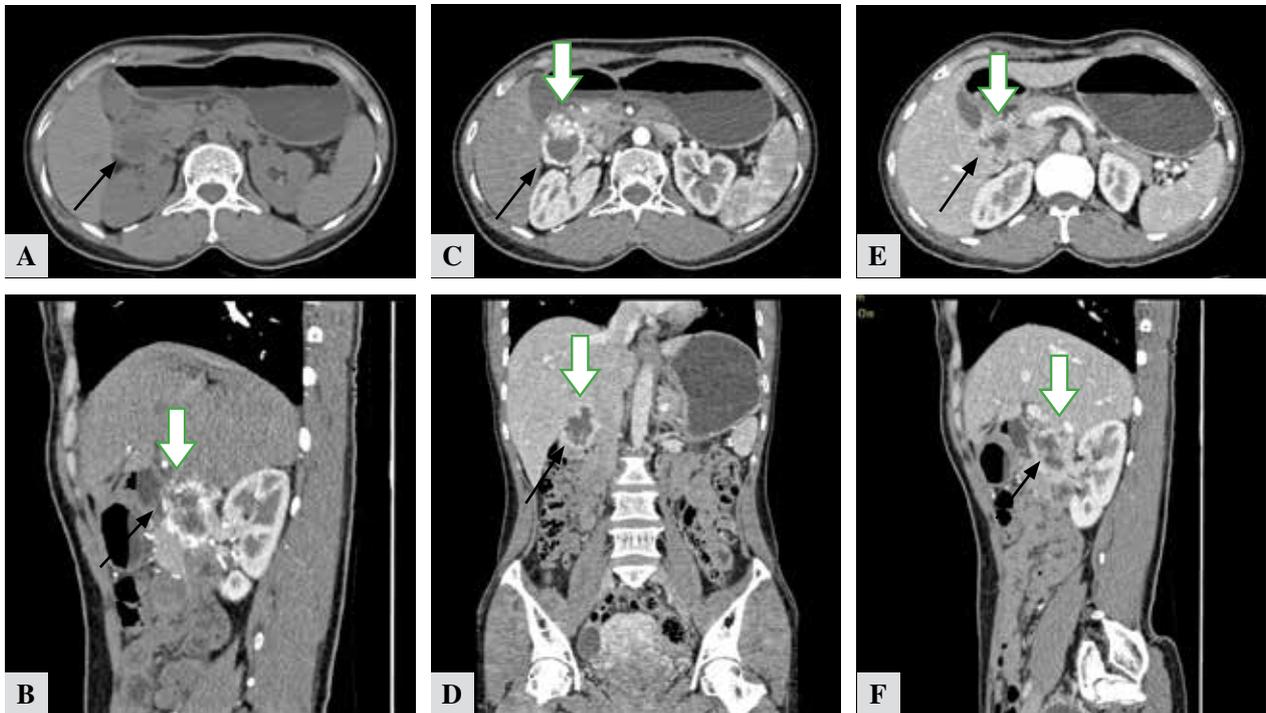


Figure 1. CT scan without injection (A), arterial phase (B), (C), and vein phase (D), (E), (F): The tumor in the duodenum posterior wall strongly enhanced, peripheral heterogeneity (black arrow), the central poorly enhanced in necrosis form (white arrow), an indistinct boundary with inferior vena cava and head of the pan

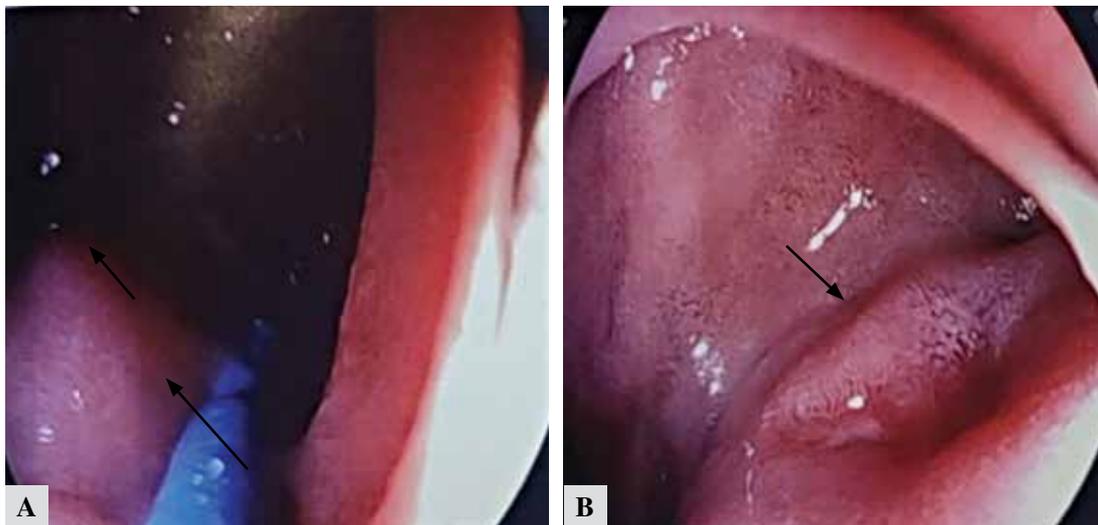


Figure 2A, 2B. Image of duodenum endoscopy: The mass protrudes into the duodenal lumen, is concave in the middle and has a small ulcer (black arrow).

The patient then proceeded to undergo a wedge-shaped duodenectomy, removing a 6cm long duodenal segment, the mucosa is intact along

with a 4x5cm tumor, rough surface, increase in vascularity, movable tumor, has not invaded surrounding organs.

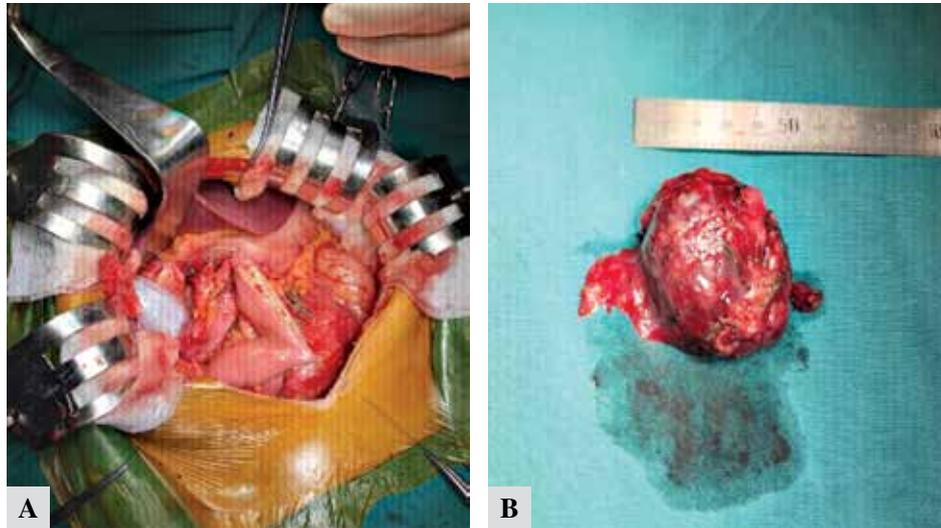


Figure 3A, 3B. Image of a rough tumor with much angiogenesis and not invading surrounding organs before (A) and surgical specimen (B)

Results of histopathology examination: macroscopic aspect is a submucosal tumor about 5x4cm in size. On a microscopic aspect: tumor tissue is composed of spindle cells with an irregular size nucleus, ... Tumor cells are arranged

in a line, divided into many directions. Analysis of immunohistochemistry staining, there are CD117 (+), DOG1 (+), CD34 (+), S100 (-), and SMA (-), which are consistent with low GIST ( $\leq 5$  multiplier/50 ....)

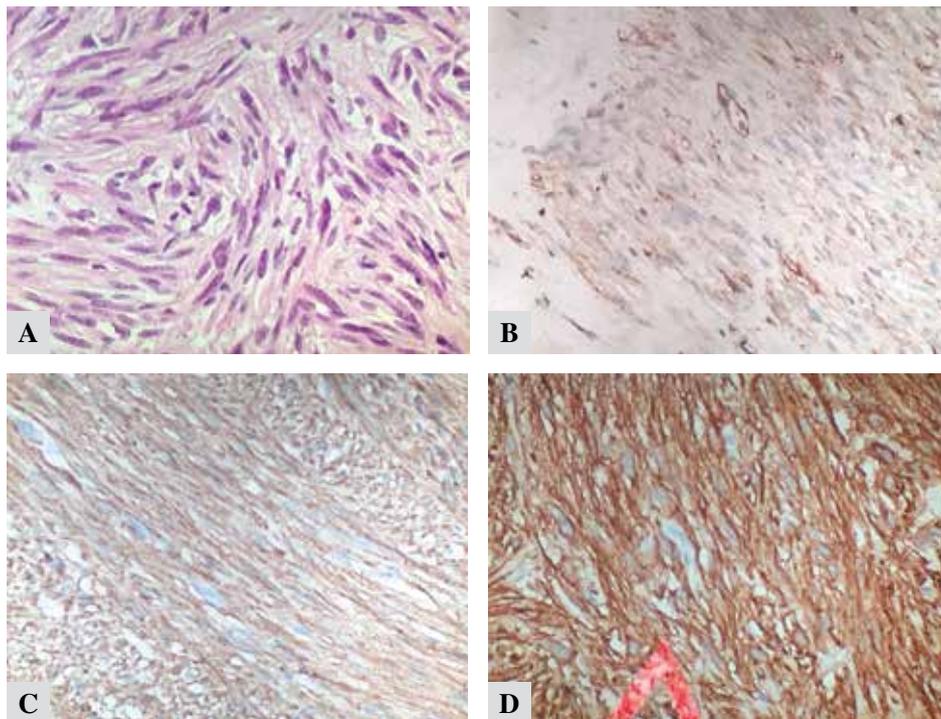


Figure 4. Histopathology aspects on surgical specimen

(A). H.E x 400, bland spindle cells, large nuclei, rich in chromatin, clustered in lines and bundles alternate. (B). CD34 x 400, tumor cells were mildly positive to cytoplasmic with antibody CD34. (C). DOG1 x 400, tumor cells were membrane and nucleus positive with DOG1. (D). CD117 x 400, tumor cells were membrane and nucleus positive with CD117.

Post-surgery, the patient was well recovered and discharged after surgery for 9 days. Patient was re-examined after 1 month, and no postoperative complications were observed or signs of local recurrence or metastasis.

**Discussion**

GIST can occur in any location of the gastrointestinal tract, also in the mesentery and peritoneum. Even though GIST of duodenum develops from the submucosa or stroma to the outside, most are accompanied by gross ulceration with a protrusion from the submucosa on endoscopic examination with large size tumor. However, small tumors, they usually do not alter the mucosa and protrude into the duodenal lumen, therefore, might not be able to detect by endoscopy. Overcoming this drawback, with high spatial resolution, endoscopic ultrasound is a useful method in an initial assessment of gastrointestinal subepithelial lesions, which allows well assessment of the original location of wounds and surrounding organs. In which the feature of GIST is a hypoechoic mass located in the muscle layer and when has 2 out of 3 features: irregular margin, cystic degeneration and lymph node malignancy have been shown to have a predictive value of 100% positive for malignant GIST. In addition, endoscopic ultrasound is also a useful method in guiding the biopsy lesion.[4] Nevertheless, endoscopic ultrasound much depends on the doctors experience and is subjective. At the present, CT scan and MRI are the two best diagnostic imaging methods to evaluate primary tumors as well as to detect metastases, especially useful with the tumors that cannot be detected by endoscopy. Tumors are usually located on one side of the gastrointestinal tract wall, in which, small tumors often have soft tissue density, clear boundary, smooth margins, contrast-enhanced moderately, and uniformity. In contrast, large tumors tend to have central necrosis and heterogeneous contrast enhancement. GIST generally does not have lymph node metastasize in the abdomen. When large

nodes are present in the abdomen, they shall be differentiated from adenocarcinoma and lymphoma. [5] In case our patient has all the mentioned signs CT scan allows for GIST.

After tumor resection wholly, approximately 40% of cases recurrence and require adjuvant chemotherapy.[6] Hence, evaluation of prognostic factors for GIST is essential for adjuvant chemotherapy. In the classification charts used to assess prognosis, the classification from the National Institutes of Health (NIH) revised in 2008 (table 1) is the most widespread clinical application.[7]

Table 1: Risk stratification of primary GIST according to NIH classification[7]

Risk	Tumor size (cm)	Mitotic rate (per 50 HPFs)	Primary tumor sites
Very low	<2.0	≤5	Any
Low	2.1-5.0	≤5	Any
	2.1-5.0	>5	Stomach
Intermediate	<5.0	6-10	Any
	5.1-10.0	≤5	Stomach
	Any	Any	Tumor burst
High	>10	Any	Any
	>5.0	>5	Any
	2.1-5.0	>5	Outside of the stomach
	5.1-10.0	≤5	Outside of the stomach

All the guidelines recommend adjuvant chemotherapy support accompanied with Imatinib (Gimatib, Glivec) in 3 years for patients with high risk or have ruptured tumor, this not only strongly reduces recurrence rate but also improves survival rate. With patients, low or moderate risk can monitor annually for 5 years after surgery is enough.[8] In case our patient, histopathology examination shows low GIST, located in duodenum around

5cm in size, should be categorized into a low-risk group, therefore, needless adjuvant chemotherapy accompanied with Imatinib (Glimatib, Glivec) that only needed to follow through diagnostic imaging annually in 5 years after surgery.

### Conclusions

The location of GIST in the duodenum is rare. The features of CT scans are suggestive but not specific for tumors, diagnostic confirmation is based on histopathology examination. Treatment and monitoring depend on the location and risk stratification of a tumor. Due to the complexity of the anatomical structure of the pancreatic duodenal mass, surgical treatment to remove the tumor depends on the invasion level into duodenal papilla and adjacent structures.

**Conflict of interest:** The authors declare that they have no conflict of interest.

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