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Case report

# An incidental finding of duodenal GIST in a patient with penetrating abdominal trauma: A case report

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ABSTRACT

*Introduction and importance:* Duodenal Gastrointestinal stromal tumors (GISTs) are rare mesenchymal tumors of the digestive tract. The tumors are derived from interstitial cells of Cajal and usually they present as gastrointestinal bleeding or non-specific abdominal pain, but they can also be asymptomatic even when they have reached considerable size.

*Case presentation:* We report a case of a 40-year-old male presented to our emergency department after sustaining a stab wound on the abdomen. Abdominal imaging tests weren't done; instead an emergency laparotomy was undertaken upfront in an attempt to catch up with a "golden hour". Intra-operatively, an incidental solid mass measuring 4 × 5 cm was noted on the third/fourth portion of the interior duodenal flexure. Histopathologically, the lesion demonstrated spindled shaped cells which were immunopositive for positive CD117. The patient fared well postoperatively and during subsequent follow up visits.

*Clinical discussion:* High-risk GISTs have malignant potential. In some cases, GIST is diagnosed as incidentally finding, mostly during surgical procedure, upper endoscopy or radiological studies related to GI tract. Surgical resection is recommended curative option and its extension depends on different factors. Tyrosine kinase inhibitors are of the utmost importance in high-risk and metastatic disease.

*Conclusion:* Even considerably large duodenal GISTs can be asymptomatic, thus incidentally found during an abdomino-pelvic imaging tests. Histopathological evaluation of the operative specimen plays a key role in assessing the need of adjuvant therapy, with a significant impact on the patients' survival.

## 1. Introduction

Gastrointestinal stromal tumors (GISTs) are mesenchymal neoplasms of the GI tract that formerly were often designated smooth muscle tumour. It is thought that GISTs originate from the interstitial cells of Cajal, which control gastrointestinal peristalsis [1,2]. Two-thirds of GISTs arise from the stomach, and one-fourth arise from the small intestine; of the latter, one-third arise in the duodenum. Colorectal lesions account for approximately 10% of GISTs [2]. Most GISTs express c-kit (CD117) while approximately 5% of do not express c-kit. We report a 40-year-old male presented to our facility with a stab wound on the abdomen. Intra-operatively, we incidentally found duodenal solid mass; which was pathologically confirmed to be a low grade malignant GIST. A brief literature review is also provided. This work has been reported in line with the SCARE 2020 criteria [3].

## 2. Presentation of case

A-40 year old African male was brought to the Emergency Medicine Department of Kilimanjaro Christian Medical Centre (KCMC); after sustaining a stab wound on his abdomen. KCMC is a tertiary referral and academic center in Northern Tanzania. Socio-demographical history revealed that the patient was a peasant. His past medical history and review of other systems were essentially un-remarkable.

On examination he had a bleeding stab wound measuring 3 × 5 cm bleeding, restless in pain with cold extremities. Glasgow coma score was 15/15, blood pressure was 107/79 mmHg, pulse rate of 98 beats per minutes, saturating at 95% on room air and respiration rate of 20

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breaths per minute. Blood work revealed hemoglobin of 7.6 g/dl. He was transfused and resuscitated according to local guidelines. Abdominal CT-scan was considered, however since it was not clear how much blood was lost and which visceral organs were injured, a team of expert surgeons opted to performed an emergency laparotomy upfront where about 1 L of hemoperitoneum was found, and a 3 cm laceration on the anterior surface of the left lobe of liver which was not actively bleeding (Fig. 1). The hemoperitoneum was evacuated by suctioning and the liver laceration was packed by Surgicel to achieve hemostasis. Incidentally, a well circumscribed oval solid mass measuring 4 × 5 cm was found in the third/fourth (D3/D4) portion on the interior duodenal flexure surface. The mass was attached to the anterior abdominal wall, (Fig. 2). The mass was resected, end-to-end anastomosis was done by an experienced specialist surgeon and the sample was sent for histopathology analysis.

Microscopically, the hematoxylin and eosin (H&E) stained sections from the mass demonstrated a well circumscribed tumour in muscularis propria made up of bland spindle cells proliferation arranged in fascicles. There were foci with stromal hyalinisation, mild cytologic atypia and low mitotic counts, (Fig. 3A-B). The tumour cells were immunoreactive with c-KIT/CD117; thus confirming the diagnosis of GIST with low malignancy risk (Fig. 3C-D). A multi-disciplinary tumour board discussion of the patient suggested that surgery was enough and thus, the patient did not receive immunotherapy. According to our local protocol, immunotherapy is reserved for the patients with malignant lesions or those with recurrent or metastatic disease. The patient fared well post-operatively; seven days later he was discharged. After three weeks, the patient was reviewed at the surgical outpatient unit, where the abdominal ultrasound was normal; and the patient reported to feed well and the incision site was healed. Subsequent monthly follow up visits for nearly one year were uneventful as the patient was free from abdominal symptoms or signs.

## 3. Discussion

Despite being the most common mesenchymal neoplasms of the gastrointestinal tract, GISTs are rare tumors with an estimated annual incidence of 1/100,000 diagnosed cases [1]. They affect mostly people in their sixties with a slightly higher prevalence in the male gender [2]. In this case, the age of diagnosis was lower than average. Duodenal involvement by this kind of tumour is rare, and the tumors have been associated with neurofibromatosis type 1 [4,5].

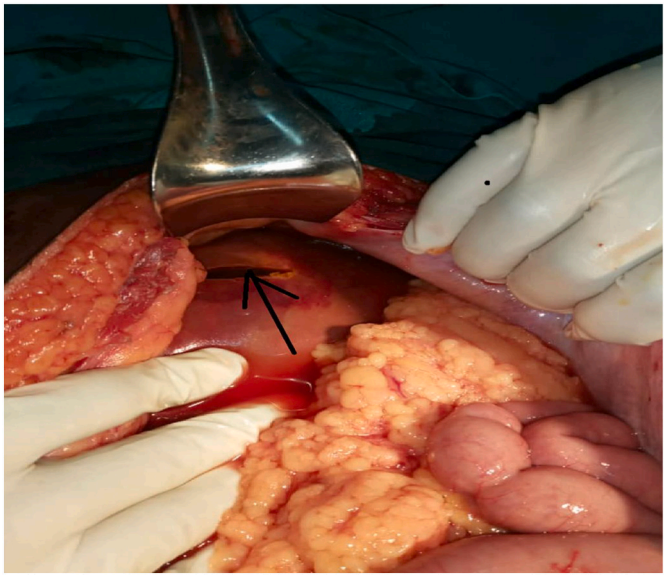

**Fig. 1.** A-3 cm laceration on the anterior surface of the left lobe of liver, not actively bleeding (arrow).

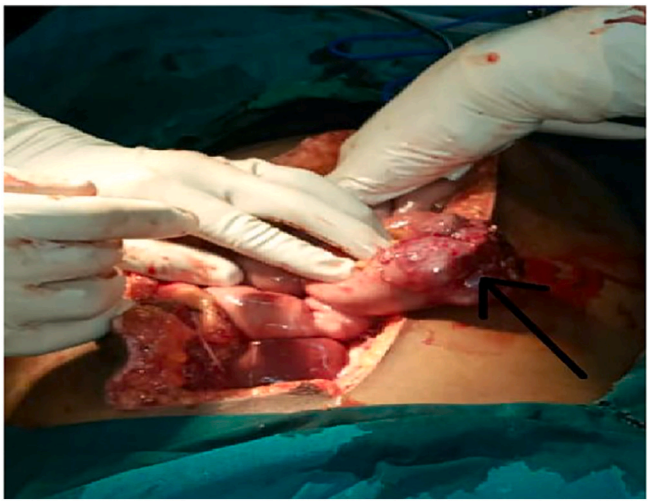

**Fig. 2.** Duodenal solid mass in the third/fourth (D3/D4) portion on the interior duodenal flexure; the mass was measuring 4 × 5 cm, (arrow).

In some cases like ours, patients with GIST are asymptomatic and are diagnosed accidentally during CT scans or upper endoscopy examination [6]. As they grow larger, they become symptomatic due to the pressure symptoms. In a large cohort study by Mendez et al., the authors reported that majority of the GIST are encountered during bariatric surgery and mostly (70.6%) on the body of the stomach [7].

Most GISTs are circumscribed, solitary, rounded, or ovoid masses. Both benign and malignant GISTs have similar macroscopic appearances, thus preventing the categorization of biologic behavior based on gross configuration [4,5]. Histologically, most GISTs fall into one of the following three categories: spindle cell type (70%), as it was the case in our patient, epithelial type (20%), or mixed type (10%) [1]. Some GISTs show a nested organized pattern, and approximately 5% show myxoid stroma and, rarely, signet ring features resulting from accumulation of glycogen, rather than mucin [1]. The common differentials of GIST include leiomyoma, schwannoma and solitary fibrous tumour.

Ninety-five percent of GISTs express c-kit (CD117), 80% express bcl-2, 60% to 70% express CD34, 30% express smooth muscle actin, 10% express S-100 protein, 50% express muscle-specific actin, and 5% express desmin; 25% and 37% of GISTs will react with the cytokeratin antibodies CAM5.2 and CK8, respectively [4,5].

All GISTs have malignant potential, which appears to be higher in those arising in the small intestine comparing to the gastric ones [8,9]. Histologically, the best known prognostic factors are tumour size and the mitotic index. Thus, evaluation of GIST for malignancy is essential for the proper management of the patients. Tumors which are $\leq$2 cm in diameter with $\leq$5 mitoses per 50 high power fields are usually benign with good prognosis. GIST which are >5 cm or >5mitoses per 50 high power fields are likely to be malignant; and poor prognostic factors include tumour necrosis, extensive hemorrhage unrelated to surgery, hypercellularity, marked cellular atypia and epithelioid pattern with mucosal invasion [8,9]. About 30–50% of the GIST are malignant with 5 year survival of 50%; malignant tumors usually metastasize to liver and peritoneum [9]. Most GISTs are treated with en bloc resection which is the gold-standard treatment for local disease [9,10]. Imatinib mesylate (Gleevec) which is tyrosine kinase inhibitor of KIT and PDGFRα is useful for metastatic or recurrent GIST [11].

## 4. Conclusion

Our report highlights that despite being rare and often diagnosed in the context of a gastrointestinal bleeding, GISTs can be asymptomatic, even when they have already reached a considerable size. Histopathological evaluation of the operative specimen plays a key role in assessing

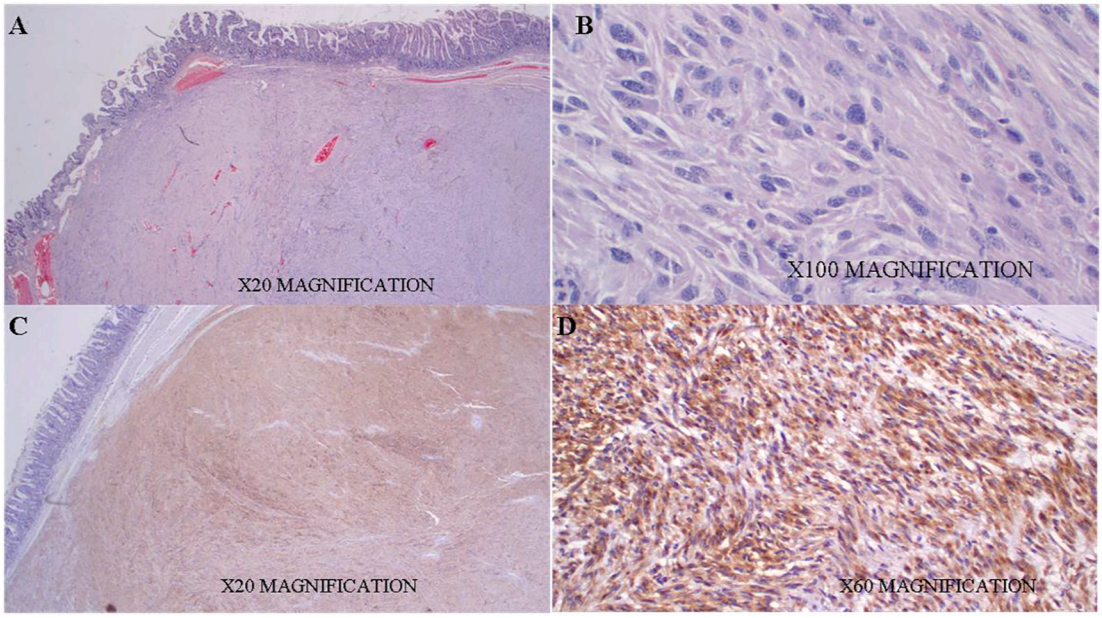


**Fig. 3.** Photomicroscopy of GIST demonstrating bland spindle cells with faintly eosinophilic cytoplasm in a syncytial pattern, H&E staining 20× original magnifications (A); 100× original magnification (B); immunopositivity of tumour cells with c-kit/CD117, 20× (C), and 60× (D) original magnifications respectively.

the need of adjuvant therapy, with a significant impact on the patients' survival.

## Abbreviations

| | |
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| CD | cluster of differentiation |
| CK | cytokeratins |
| CT | computerized tomography scan |
| GIST | gastrointestinal stromal tumour |

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## Ethics approval

There was exemption of ethical clearance.

## Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Authors' contributions

All authors made substantial contributions to the paper. JJP prepared the initial manuscript version. ERS, JJP, KB and JL reviewed the patients' medical records, planned and executed management. JL was the lead surgeon. AM performed histopathological analysis, critically reviewed the paper and prepared the final manuscript. All authors read and approved the final manuscript.

## Research registration

N/A.

## Guarantor

Dr. Alex Mremi is the Guarantor of this work.

## Provenance and peer review

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## Declaration of competing interest

All authors have declared that no competing interests exist.

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