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Case report

A wandering small bowel stromal tumor with a challenging imaging diagnosis

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Abstract. We report a rare case of a small bowel stromal tumor in a 57-year-old female patient, presenting as a wandering abdominal mass on imaging. The patient arrived at the emergency room with complaints of recurrent diffuse abdominal pain, weight loss, and anemia. An urgent CT scan of the abdomen revealed a right lower abdominal mass of uncertain origin. Following hospitalization, an MRI was conducted, which showed the mass had migrated to the upper left side of the abdomen. Additionally, an ultrasound was performed to provide a comprehensive imaging assessment. The mobility of the abdominal mass posed a significant challenge for imaging-based diagnosis, leading to a preliminary diagnosis of a gastrointestinal stromal tumor (GIST). This diagnosis was later confirmed by histopathological biopsy. This case highlights a diagnostic challenge in clinical practice and emphasizes the importance of considering mobile abdominal masses in differential diagnoses. Despite extensive medical literature, cases with such elusive imaging characteristics have rarely been documented in recent decades. (www.actabiomedica.it)

Key words: abdominal mass, diagnostic imaging, GIST, small bowel stromal tumor, mobile tumor, wandering tumor

Introduction

Gastrointestinal stromal tumors (GISTs) are uncommon mesenchymal tumors that can occur anywhere along the gastrointestinal tract. They are most frequently found in the stomach (65%), followed by the small bowel (20%), with rare occurrences in the rectum, esophagus, colon, and appendix. There have also been sporadic reports of GISTs arising from the omentum, mesentery, and retroperitoneum (1, 2). Notably, GISTs originating in the small intestine and rectum have a higher malignant potential compared to those in the stomach (3). GISTs affect men and women equally and can occur at any age but are most commonly diagnosed in individuals over 60 (4, 5). Many GISTs are asymptomatic and are often discovered incidentally during examinations for other conditions. Symptoms typically manifest when the tumor grows to 6 cm or larger, which can lead to compression of nearby organs or bleeding due to the tumor's vascular nature (1, 2). The five-year survival rate for malignant GISTs ranges from 35% to 65%, with prognoses largely dependent on factors such as tumor size, mitotic index, and location. Invasion of neighboring structures and distant metastases are the most reliable indicators of malignancy in GISTs. The preferred treatment is surgical resection (6, 7). In the case under discussion, initial CT scans suggested a tumor of annexal origin located in the right iliac fossa. However, subsequent MRI and ultrasound imaging revealed a positional change to the left upper side of the abdomen, varying with the patient's decubitus. These findings presented a diagnostic

challenge in determining the tumor's origin, which was ultimately identified as a GIST.

Case Presentation

A 57-year-old woman presented to the emergency room with gastrointestinal symptoms, referring a recurrent diffuse abdominal pain and weight loss in the last months. Physical examination of the abdomen did not reveal a palpable mass and laboratory tests revealed an anemic condition. Clinicians suspected a gastrointestinal neoplasm and/or gastrointestinal bleeding. The patient underwent an urgent abdomen CT scan with medium contrast administration that revealed in the right flank a lobulated mass located on the right, near the ipsilateral annex and a small bowel loop, without clear signs of cleavage (Figure 1).

During the subsequent hospitalization, the patient underwent an MRI with medium contrast administration that confirmed the presence of a mass but localized in the upper right side of the abdomen (Figure 2).

Immediately after the MRI examination, a US was performed to add information about the mobility and the imaging features (Figure 3).

The histopathological biopsy diagnosed a gastrointestinal stromal tumor.

Discussion

In this clinical case, the differential diagnosis hinged critically on the imaging characteristics of the mass. Its mobility and specific imaging features, such as echogenicity, density, and intensity, were key in formulating a diagnostic hypothesis. Initially, the mass demonstrated a notable migration within the abdomen, moving from the lower to the upper region and from right to left, as observed in the CT and MRI scans, respectively (Figure 4).

While the CT scan made it challenging to rule out an annexal origin for the mass, the MRI was instrumental in better understanding its location. Specifically, it suggested a small bowel origin, particularly from the jejunum, considering its high mobility. This mobility was further confirmed by ultrasound (US), which revealed a slight displacement of the lesion when the patient moved from a supine to a lateral decubitus position. The imaging appearance exhibited typical characteristics of a mesenchymal tumor. The trans-abdominal

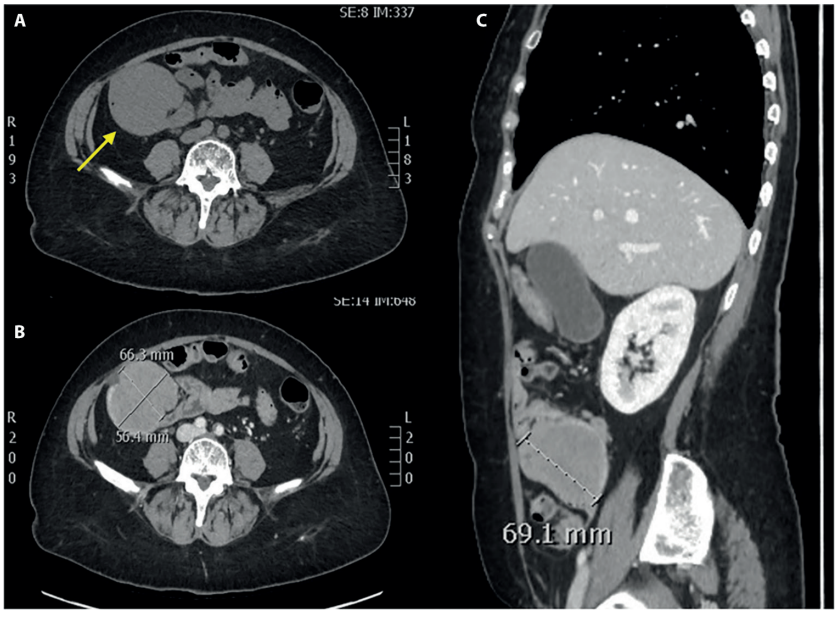

Figure 1 (a, b, c). Abdomen CT scans: a) axial scan before contrast agent administration showed a hypodense mass in the right flank (yellow arrow); b) axial scan in the venous phase showed the enhancing mass measuring 66x56mm; c) coronal scan in the venous phase showed the maximum lesion extension of about 7 cm.

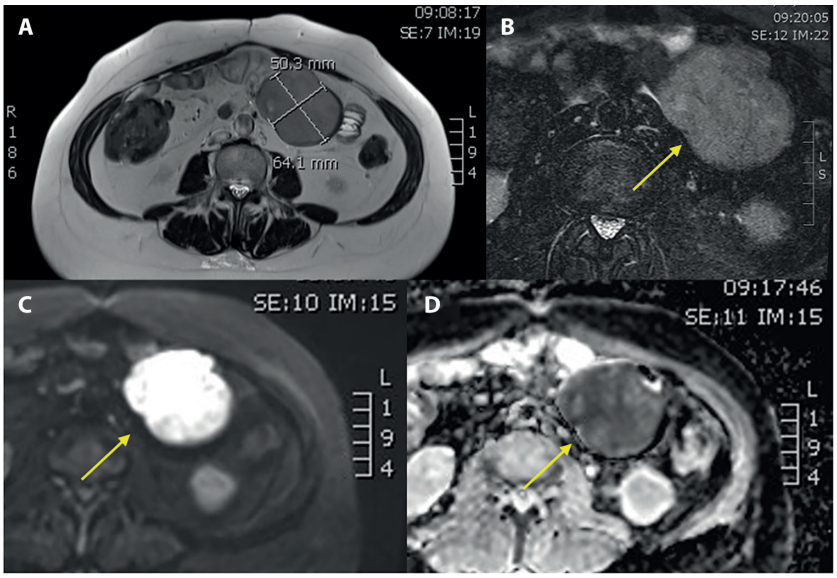

Figure 2 (a, b, c, d). Abdomen RM scans: a) a heterogeneous mass (yellow arrows) in the T2-w sequences; b) without fat content in the T2-w fat-suppressed; c) and d) the restriction of the SI in the DWI at high b-values and the ADC map.

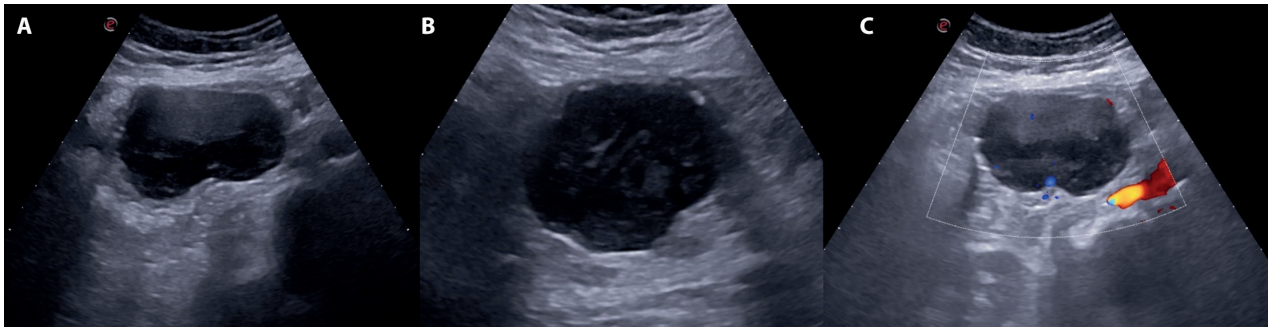

Figure 3 (a, b, c). US images: a) transverse and b) sagittal planes of the heterogeneous mass, c) with color spots at ECD application.

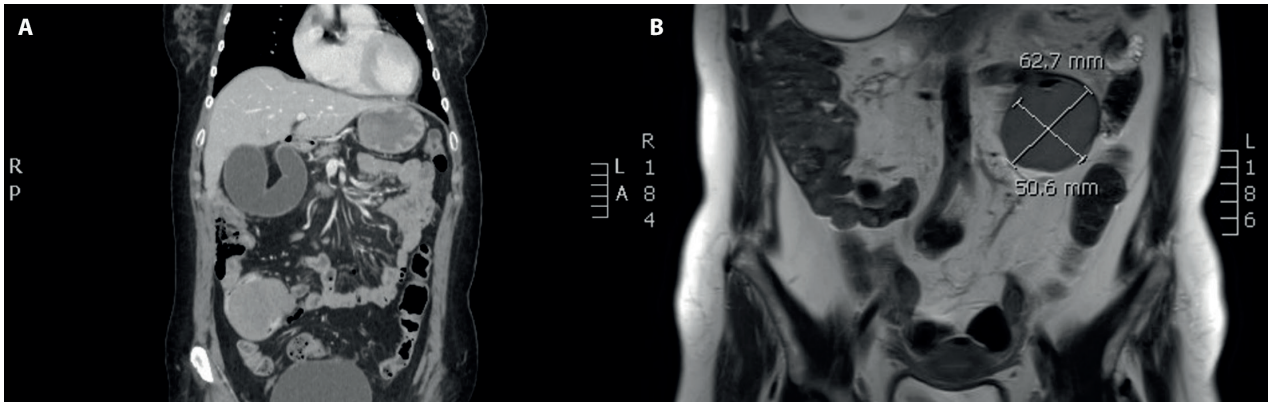

Figure 4 (a, b). The moving mass appeared a) in the right flank in the CT scan and b) in the left flank in the MRI scan.

Table 1. A comparison between our case and published cases: demographics, tumor location, presentation, diagnosis, and management strategies.

	Our Case	Mantese (2019)	Lau et al. (2004)	Fujita (2013)	Ramani et al. (2017)	Joensuu et al. (2013)	Iorio et al. (2014)	Feng et al. (2020)	Duarte et al. (2017)	Khouchoua et al. (2023)	Relevant Literature
Patient Age	57 years	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Various ages, commonly diagnosed in those older than 60
Gender	Female	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Not specific	Equally affects men and women
Tumor Location	Small bowel	Gastrointestinal tract	Gastrointestinal tract	Small bowel	Mesentery	Gastrointestinal tract	Gastrointestinal tract	Stomach	Anal region	Gastrointestinal tract	Commonly stomach and small intestine
Presentation	Wandering abdominal mass	Not specific	Not specific	Small tumors	Acute abdomen	Not specific	Not specific	Small gastric tumors	Imaging features	Chronic abdominal pain	Varies, often asymptomatic
Diagnosis	Histopathological biopsy	Imaging, biopsy	Imaging	Management strategies	Imaging, clinical	Comprehensive review	Biology, diagnosis, management	Cutoff size for tumors	Imaging features	Imaging, clinical	Imaging, immuno-histochemistry, biopsy
Management	Not specified	Treatment modalities	Not specified	Not specified	Not specified	Overview	Review of management	Best cutoff size	Imaging features in diagnosis	Case report	Surgical resection, tyrosine kinase inhibitors

US showed a lobulated hypoechoic mass. The CT scan provided valuable multiplanar information, delineating the full extent of the sharply marginated, pseudocapsulated tumor with homogeneous density. Notably, calcification, an atypical feature of GIST, was absent. Post-contrast agent administration, the tumor exhibited homogeneous enhancement. MRI was particularly beneficial, offering enhanced characterization. It revealed a well-circumscribed, lobulated, exophytic mass arising from the mesenteric side of an intestinal loop. On T1-weighted images, the mass showed low to intermediate signal intensity (SI), heterogeneous SI on T2-weighted images, and no hypointense SI on fat-suppressed sequences. Diffusion-weighted imaging (DWI) and apparent diffusion coefficient (ADC) mapping confirmed the lesion's solid nature with hypercellular content. Furthermore, the mass was determined to have a submucosal origin, arising from the muscularis propria of an adjacent intestinal loop, tending more to displace than to invade surrounding structures (2, 8, 9). Histopathological biopsy was pivotal in establishing the tumor-type diagnosis, confirming the imaging-led hypothesis of a GIST tumor of the small bowel. To our knowledge, recent literature has not described similar cases of gastrointestinal cancer with small bowel origin and such distinctive mobility features from an imaging perspective. Therefore, this reported case can aid radiologists faced with ultrasound, CT, or MRI images of ambiguous nature, enabling them to formulate a diagnostic hypothesis. Table 1 provides a comparison between our case and other cases/reviews in the literature, highlighting the uniqueness of our case in terms of the tumor's wandering nature and the diagnostic challenges it presented.

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Ethics and Patient's Informed Consent: Written consent was obtained from the patient for publication of relevant medical information within the manuscript.

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