CT IMAGING OF GASTROINTESTINAL STROMAL TUMOUR – CASE REPORT AND LITERATURE REVIEW

Stoyanka Dineva[1], Dobrina Mlachkova[1], Adelina Pavlova[2], Deyan Todorov[3]

[1] Department of Radiology, Medical Institute of Ministry of Interior–Sofia, Skobelev blv 79 Sofia1606, Bulgaria, dineva_g@abv.bg

[2]Department of Nuclear Medicine, Medical Institute of Ministry of Interior – Sofia, Skobelev blv 79 Sofia1606, Bulgaria

[3]Department of Surgery, Medical Institute of Ministry of Interior – Sofia, Skobelev blv 79 Sofia1606, Bulgaria

Abstract

A gastrointestinal stromal tumour (GIST) is a type of soft tissue sarcoma that develops in the digestive tract. Gastrointestinal stromal tumors (GIST) are the most common mesenchymal neoplasms of the gastrointestinal tract with a malignant potential. However, uncommonly they can be associated with synchronous tumors of different histogenesis. Most GISTs begin in the stomach or small bowel, but they can develop anywhere along the digestive tract. About 6 out of 10 (60%) of these tumours start in the stomach. Very rarely, they develop outside the gastrointestinal tract.

Keywords: Gastrointestinal stromal tumor, sarcoma, stomach

1. Introduction

Gastrointestinal stromal tumors (GIST) are the most common mesenchymal tumors of the gastrointestinal (GI) tract although accounting for only 0.1-3% of all GI neoplasms. These can arise anywhere along the GI tract. The synchronous occurrence of GIST and other primary GI malignancies is uncommon [1,2].

2. Presentation of case

A 63-year-old male presented with history of two episodes of melena and drop in hemoglobin for 6 months. He complains of faintness and rapid fatigue. Upper GI endoscopy revealed a nodular lesion in the gastric small curvature with a central ulcer. Its size is about 3 cm. The patient was referred for CT examination. Contrast-enhanced computed tomography (CT) of upper abdomen showed a large nodular lesion in the small curvature of stomach. An additional finding was splenic cyst.[14,19]

Small intramural tumors of the stomach are often discovered incidentally. When dedicated radiologic evaluation of the stomach is desired, adequate gastric distention is important to avoid overlooking small lesions and to differentiate prominent gastric rugae from true masses. Also important is a technique that distinguishes the mucosal surface. CT is routinely performed for further assessment of gastric masses.

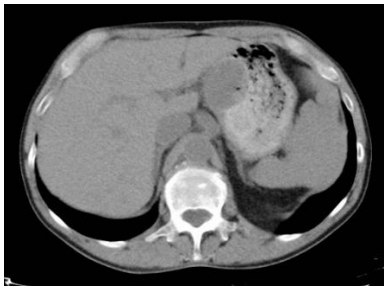

Fig. 1 Anenhanced CT - growth patterns of intramural masses.

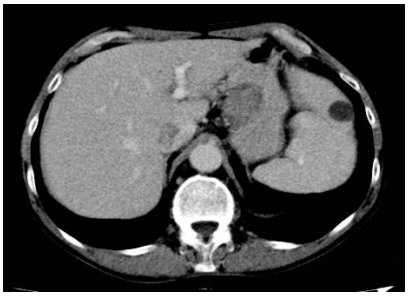

Fig. 2 Contrast-enhanced CT - arterial phase

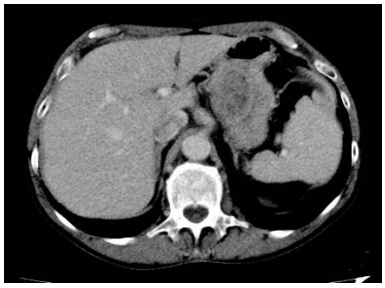

Fig. 3 Contrast-enhanced CT - venous phase

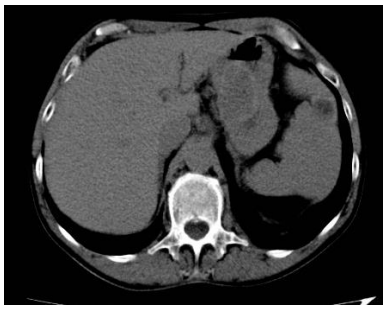

Fig.4 Contrast-enhanced CT - parenchymal phase

At CT, gastric distention can be achieved with oral contrast material. Both positive and negative oral contrast agents have been used. Although an intramural mass may be seen as a low-attenuation filling defect, mucosal enhancement can be missed if positive oral contrast material is used. Use of negative oral contrast agents (water or low-concentration barium sulfate, on the other hand, improves visualization of enhancing mucosa.

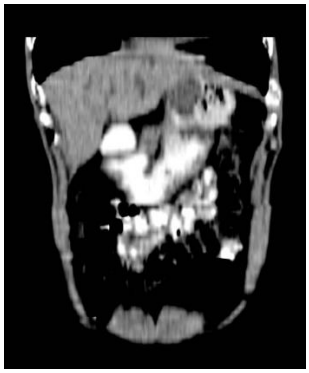

Fig. 5 Intramural masses - sagittal plane

3. Discussion

Gastrointestinal stromal tumors have been reported in all age groups. However, they occur predominantly in adults older than 50 years, with a median age of 58 years.1 There is no sex predilection. Although GISTs occur in the pediatric population, pediatric GISTs have enough differences in their pathogenesis and clinical behavior that they are best considered a separate clinicopathologic entity (discussed below). Although GISTs occur throughout the gastrointestinal tract, the most common locations are the stomach (60%), jejunum and ileum (30%), duodenum (5%), and colorectum (<5%). Rare cases have been reported in the esophagus, appendix, and gallbladder. [3] Rarely, GISTs can present in the mesentery, omentum, and retroperitoneum and are referred to as extragastrointestinal GISTs. People with early stage GIST often do not have any symptoms. So early stage GIST may be found when people are having tests for other medical conditions.[17,18] Most GISTs are diagnosed in later stages of the disease. The symptoms of advanced GIST are likely to include

- ✓ Pain or discomfort in the tummy (abdomen)
- ✓ A feeling of fullness
- ✓ Being sick Blood in stools or vomit
- ✓ Feeling very tired
- ✓ A low red blood cell count (anaemia)

Computed tomography (CT) scans are typically sufficient for imaging most GISTs; however, there may occasionally be a role for combination positron emission tomography (PET)/CT where results could affect management decisions. Magnetic resonance imaging (MRI) may also be considered. [8,15]

Small tumours found incidentally by endoscopy should be evaluated using CT or endoscopic ultrasound (US). Typically, unenhanced CT is sufficient to detect most lesions, and intratumoural hemorrhage. Triphasic imaging is required after imatinib treatment to avoid misinterpretation of hepatic lesions which may not represent new or progressive disease.

MRI is generally preferred for preoperative staging of rectal GISTs, whereas CT is preferred for evaluating tumour response after treatment with imatinib, though PET/CT may be required in some instances where CT alone provides unclear results. CT/PET may be useful for detecting primary resistance of borderline resectable GISTs allowing timely resection before progression, particularly in GISTs which have not been assessed with molecular tests. When evaluating treatment response, PET is only useful if a baseline PET is available for comparison.[6,9]

A variety of mesenchymal tumors should be considered in the differential diagnosis of GIST. These include:

- ✓ Intramural leiomyomas
- ✓ Primary leiomyosarcomas
- ✓ Gastrointestinal schwannomas
- ✓ Mesenteric fibromatosis or intra-abdominal desmoid fibromatosis

- ✓ Inflammatory myofibroblastic tumor
- ✓ Inflammatory fibroid polyp

Treatment response should be evaluated by a radiologist with experience evaluating GIST treatment response. CT is typically sufficient to assess treatment response (though PET/CT may be valuable in some instances where CT provides unclear results). [7,21,23]

Tumour shrinkage alone may be an unreliable indicator of early response to treatment. Decreased tumour density and changes in morphology on CT (or in some cases MRI) may be valuable. Cystic degeneration on CT during therapy may be misidentified as the development of new lesions. A growing nodule within a stable mass on contrast-enhanced CT may be an early indicator of disease progression. When patients are on treatment, follow-up with CT every 3-6 months is recommended. Follow-up CT imaging is recommended every 3-6 months for a minimum of five years post-resection for intermediate- and high-risk patients. For low-risk tumours the usefulness of a routine follow-up is not known; if selected this is carried out with abdominal CT scan or MRI every 6-12 months for 5 years. Very low risk GIST's probably do not deserve routine follow-up although one must be aware that the risk is not zero.

4. Conclusion

Although the various layers of the gastric wall cannot be differentiated on CT images, the mucosa can usually be distinguished from other layers by virtue of its prominent enhancement during the arterial phase. In a later phase of contrast enhancement, the gastric wall may appear as a single enhancing layer.[5,16]

Dual-phase (arterial, portal venous) or triple-phase (unenhanced, arterial, and portal venous) imaging is helpful not only for determining the enhancement pattern of an intramural mass, but also for detecting hypervascular liver metastases, such as those from GISTs or carcinoid tumors, which could be missed on portal venous phase images. The unenhanced phase is helpful for assessing the presence of calcifications, especially when positive oral contrast material has been used.

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