CT-Angiography in gastrointestinal bleeding: Finding GIST

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Learning objectives

Recognize the radiological signs by CT GIST’s angiography by discerning gastrointestinal bleeding.

Background

Topic Review

The gastrointestinal stromal tumor (GIST), is the most common mesenchymal neoplasm into digestive tract, but it represents less than 3% of gastrointestinal neoplasms. It can occurs in any part of the digestive tract and they are benign until an 80%.

Gastrointestinal stromal tumors are defined as single groups of mesenchymal neoplasms. Most of the medical literature refers to these as smooth muscle tumors, leiomyomas, epithelioid leiomyosarcomas and leiomyoblastomas. It is supposed that these tumors are originated at the smooth muscle layers in the gastrointestinal tract wall. The best feature that defines expression GIST KIT (CD117), an epidermal growth factor, tyrosine kinase. The KIT immunoreactivity distinguishes GISTs from original leiomyomas, leiomyosarcomas, schwannomas and neurofibromas (1).

Clinical Manifestation:

GIST’s clinical manifestation is very inconstant. For some patients that carries benign characteristics GISTs are small and diagnosed incidentally during radiological examination. In return the highly aggressive is abundant or big and may reach symptomatic invade adjacent organs.

The signs and symptoms depend extremely by the size and location of the tumor. GISTs are found frequently at the stomach (70%), followed by the small intestine (20% -30%) and anorectum (7%), (2).

The average clinical manifestation of GIST is the symptomatic gastrointestinal mucosa's and submucosa's bleeding ulceration, which is not necessarily secondary trough tumor infiltration. They may have hematemesis, melena, hematochezia, or anemia caused by occult bleeding. Other symptoms could include nausea, vomit, abdominal pain, weight loss, bloating and bowel obstruction (1).
Among the most common complications described in these tumors are the superior or inferior gastrointestinal bleeding, depending if it is located near or distant to the ligament of Treitz, intestinal occlusion, abscess and tumor perforation (3).

**Imaging findings OR Procedure details**

**Technical and radiographic features of gastrointestinal bleeding in GIST**

Gastrointestinal stromal tumors (GIST) that affect the jejunum-ileum are a strange cause of lower gastrointestinal bleeding (2). The diagnosis in the preoperative study is very important because of the difficulties presented while accessing endoscopically to the small intestine and sometimes surgical analysis are the last diagnostic and therapeutic option, consequently in recent years, advances in CT angiography plays an essential role when determining the cause of bleeding or spotting.

The technique of choice in patients with uncertain bleeding GIST is the CT angiography, which is inserted intravenous contrast (120 ml to 4 ml / sec) followed by a bolus of saline (40 ml at 4 ml / sec), while an absence of oral contrast and comprises three phases: a baseline without contrast, an arterial phase and a late venous phase (70 seconds).

Into the arterial phase active gastrointestinal bleeding has been defined as an active intraluminal contrast extravasation presenting a density of 90-100 hounsfield units (UH). The second one, late venous phase is best demonstrated bleeding, this is more extensive than the previous phase. Indirect signs of active bleeding are vascular lesions or increased attenuation of the loop comparing it to the study without contrast.

**Clinical Cases**

We present two patients with symptoms of abdominal pain, melena, hematemesis, hypotension and falling hematocrit, which went through a CT angiography. There were signs of active arterial bleeding or irregular mass wall with an initial diagnosis of GIST. They were treated with surgery depending on the results produced by CT angiography and clinical presenting. The pathology confirmed the diagnosis of GIST.

**First Case**
62 years old women, carrying an upper gastrointestinal bleeding and gastroscopy normal, who presents melenas and anemia in spite of multiple transfusions. The CT angiography was accomplished in three phases (Fig. 1) Showing a hyperdense image, localized into a small bowel in the left pelvis, most visible during the venous intraluminal study it is compatible with active bleeding, whose branches depend of the superior mesenteric artery. The patient was under surgery where there was found a tumor with height of 4-5 cm in the antimesenteric edge, 60 cm from angle Treitz. The pathology threw the presence of a 7 x 3.5 cm GIST. (Fig.2).

Second Case

59 years old man with melena, hematemesis, hypotension and falling hematocrit. CT angiography has been delivered where it is observed that in the basal study hyperdense punctiform images in distal jejunum, compatible with bleeding sites. The arterial and venus (Fig. 3) vascularization study was different from standard jejunal vessels with a ball that draws from the distal jejunal artery a venous drainage veins and segmental superior mesenteric vein. It decides the performance of arteriography (Fig. 4) to study better evaluates the injury and endovascular treatment options, noting abnormal vascularization with drainage jejunal segmental, jejunal veins draining into the superior mesenteric vein. We have discussed the case with General Surgery and decided urgent surgery for treatment as embolization endovascular injury could be at risk of intestinal ischemia. What has been found, a vascular tumor with a characteristic of 7cm x 5cm in diameter and antimesenteric edge of distal jejunum. Histopathology confirmed the diagnosis of intermediate-risk GIST (Fig. 5).

Images for this section:
**Fig. 1:** CT angiography with MIP reconstruction in coronal and sagittal image where there is a mass with increased vascularity and active bleeding from distal branches of the superior mesenteric artery.
**Fig. 2:** Pathology: jejunal resection specimen measuring 7 x 3.5 cm GIST diagnosed with low histological grade.
**Fig. 3:** CT angiography with MIP reconstruction in arterial and late venous phase that shows a deviation from normal jejunal vascularity with a round mass of vessels that feeds from the distal jejunal artery.
Fig. 4: Selective arteriography of the superior mesenteric artery, which displays abnormal vascularization jejunal and jejunal segmental drainage veins, which drains into the superior mesenteric vein.
Fig. 5: Pathology: The tumor measuring 8 × 7 × 2 cm, lobed, dark brown coated by a thin capsule bowel mucosal ulcer diagnosed with intermediate risk GIST.
Conclusion

The CT angiography is the technique chosen for diagnosis of GIST with acute gastrointestinal bleeding.

It is important to recognize this pathology when a proper therapeutic management is used. Because of last reason it is very important the radiologist would be familiar with this pathology and radiological findings, for special attention to patients with active bleeding gastrointestinal.

References


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