

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

### Medical Imaging Quiz – Case 3

The patient went to the ER for abdominal pain of acute onset. The physical examination showed hypotension, tachycardia and abdominal tenderness. The patient had a history of by-pass surgery 7 years ago.

Plain abdominal films and ultrasound scanning showed non-specific findings. Abdominal CT scan showed characteristic findings (figures 1 and 2). The patient underwent surgery, and the diagnosis was confirmed.

#### Comment

*Bowel ischemia results from decreased intestinal blood flow. It has a high mortality rate, and can be caused by different etiologic factors.*

*Clinically, it presents with non-specific symptoms, depending on the acuteness of the situation. In the acute setting, it usually presents as sudden local abdominal pain and hemorrhage, accompanied by hypotension, tachycardia and abdominal tenderness. In chronic states, it shows non-specific abdominal pain and diarrhea with or without bleeding.*

*The most common causes of acute bowel ischemia are: (a) Embolus in the superior mesenteric artery, associated to cardiovascular problems. Intestinal arterial or venous thrombi are not as common as emboli. (b) Non-occlusive causes, such as decreased cardiac output (cardiac disease, infarction, arrhythmia, hypovolemia) which can be associated with arterial vasospasm (hypotension, drug overdoses). (c) Bowel obstruction resulting from adhesions or hernias. (d) Neoplasms (colonic carcinoma or pancreatic carcinoma with invasion of the mesenteric root). (e) Vasculitis, usually polyarteritis nodosa. (f) Abdominal inflammatory conditions (pancreatitis, appendicitis, diverticulitis, peritonitis). (g) Trauma or corrosive injury. (h) Chemotherapy. (i) Radiation therapy.*

*The imageneologic findings are similar, regardless of etiology. Plain abdominal films and double-contrast bowel barium studies show focal or diffuse thickening of the bowel wall, with or without the thumbprinting sign, bowel loop dilatation, mesenteric or portal venous gas (fig. 1), and intramural pneumatosis (fig. 2).*

*In angiographic studies, either an arterial or venous occlusion, or vasospasm causing diminished flow can be seen. CT and MRI, besides demonstrating the ischemic bowel segments, can also help to determine the primary cause. The most common finding is increased thickness of the bowel wall, which usually forms the "target" sign.*

*However, when the involved segment becomes gangrenous, it can be seen thinner, or not seen at all. Other findings include*

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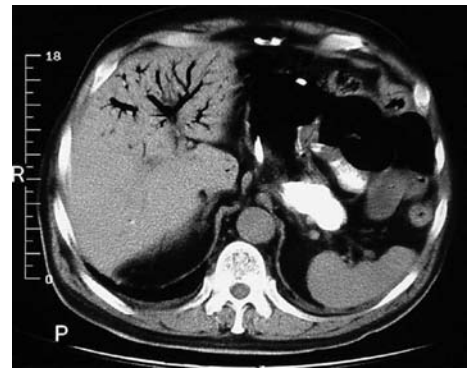


Figure 1



Figure 2

*arterial occlusion and mesenteric or portal vein thrombosis, lack of mural enhancement in CT and MRI, compared to onischemic segments. A less common, but more specific sign, is intramural gas, which is associated with a high mortality rate. Air can also be seen in portal vein or mesenteric veins as a result of propagation of intramural gas into the mesenteric venous system. Free intraperitoneal fluid is another finding and intraperitoneal air, indicating perforation. Mesenteric edema and engorgement of the mesenteric veins may also be noticed. In order to recognize the signs of bowel ischemia, the radiologist should consider not only the imageneologic studies, but also the relevant clinical information to avoid a delayed diagnosis.*

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*Diagnosis: Bowel Ischemia*