

Tumours of the small bowel: the key MDCT features

María Herraiz, Xenia Codó, Carmen Rodrigo,
Jorge Monzó, Susana García.

Unidad de TC y RM. Aliancerioja. Hospital S Pedro. Logroño/ES

LEARNING OBJECTIVES

- Review the **role** of multidetector computed tomography (**MDCT**) in the **diagnosis** and in some cases in the **differential diagnosis** of **small bowel tumours**.

The authors of this poster have no pertinent disclosures

BACKGROUND

- **Differential diagnosis** of small bowel tumours is **extensive**:
 - . **Benign tumours**: lipoma, adenomatous polyps.
 - . **Benign/borderline/malignant tumours**: gastrointestinal stromal tumours (GIST).
 - . **Malignant tumours**:
 - . Metastases
 - . Primary malignancies: adenocarcinoma, lymphoma and carcinoid tumour.

BACKGROUND

- Small bowel neoplasms represent a **small percentage** of gastrointestinal cancers, yet are among those with the **poorest prognosis** compared with other gastrointestinal malignancies.
- **Delayed diagnosis** of these neoplasms frequently occurs and may arise because of many factors, including **difficult endoscopic access** and **low index of clinical suspicion**.

BACKGROUND

- The **most common malignancy** involving the small bowel is **metastatic**.
- Small bowel metastases are **categorized by means of spread**:
 - Intraperitoneal seeding
 - Hematogenous spread
 - Local extension

BACKGROUND

- **Primary malignancies** of small bowel tumours **in order of frequency**:

- Adenocarcinoma

- Carcinoid tumour

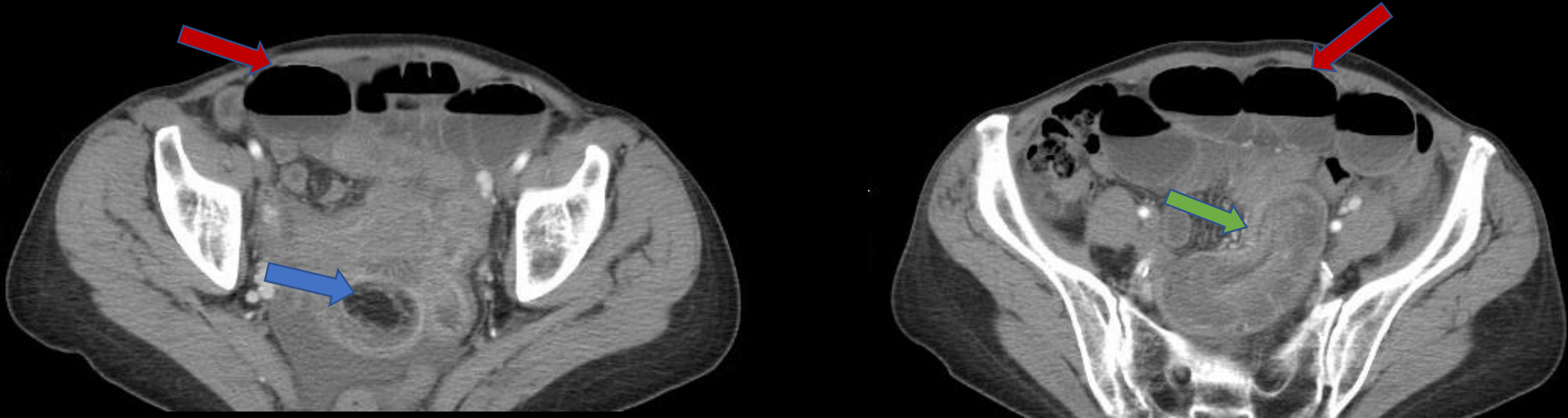
- Lymphoma

- GIST

BACKGROUND

- **Most frequent location** of each type of malignant tumour:
 - **Adenocarcinoma**: duodenum and proximal jejunum
 - **Carcinoid tumour**: distal ileum
 - **Lymphoma**: ileum
 - **Malignant GIST**: distal ileum

Case 1: 73 y/o F with abdominal pain and vomiting

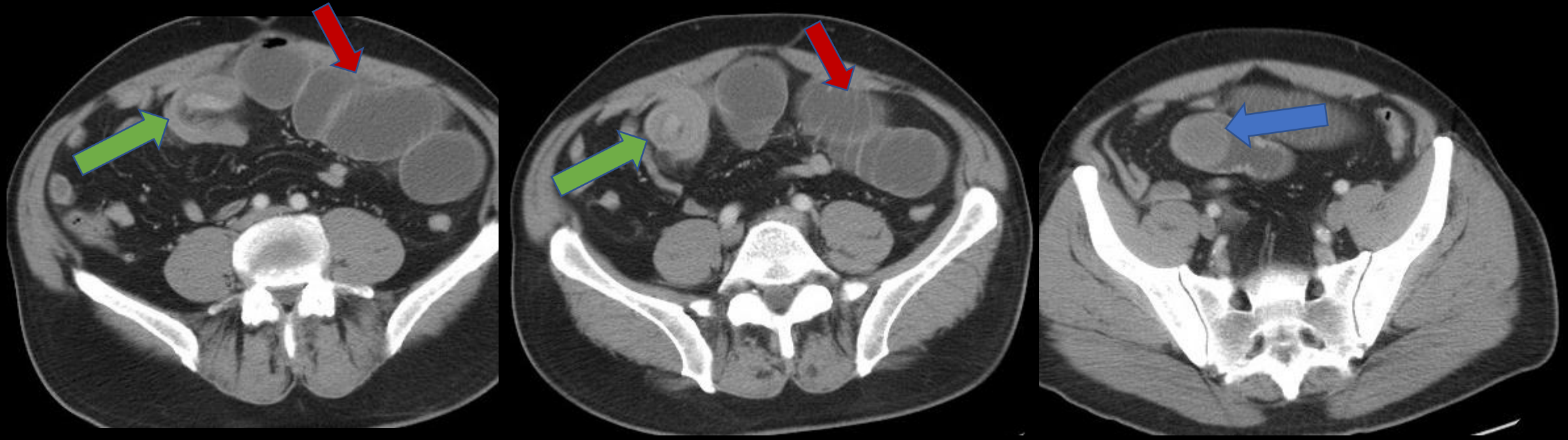


IMAGING: axial MDCT scans in portal venous phase show an homogeneous intraluminal mass with fat attenuation (blue arrow) in the ileum, typical aspect of lipoma. This tumour was the lead point of a small bowel intussusception (green arrow). Note the proximal dilated bowel loops (red arrows).

PATHOLOGY: lipoma.

"An endophytic growth lesion because it originates from the submucosa layer"

Case 2: 59 y/o M with abdominal pain and diarrhea



IMAGING: axial MDCT scans in portal venous phase show an homogeneous intraluminal mass (blue arrow) in the ileum. This tumour was the lead point of a small bowel intussusception (green arrows). Note the proximal dilated bowel loops (red arrows).

PATHOLOGY: an adenomatous polyp (3 x 2,5 cm) that causes intussusception.

Case 3: 38 y/o F with melena, severe anemia and a duodenal ulcer in endoscopy

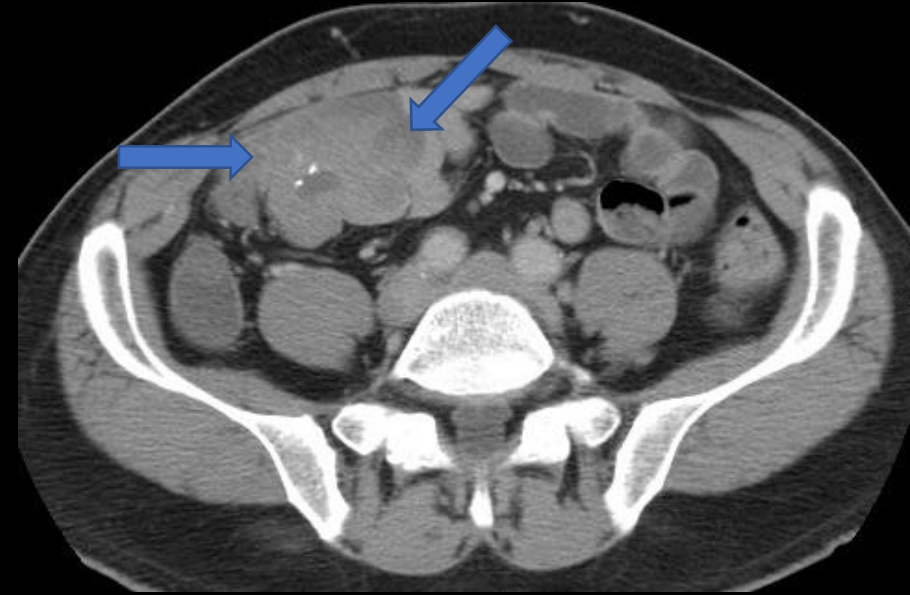


IMAGING: axial MDCT scan with IVC in delayed arterial phase shows an endo-exophytic hypervascular mass (blue arrow) originating from duodenum (green arrow).

PATHOLOGY: low grade GIST.

“Hypervascular intraluminal GISTs are associated with hemorrhage and ulceration”.

Case 4: 52 y/o M with asthenia, abdominal pain and a palpable mass in right lower quadrant.

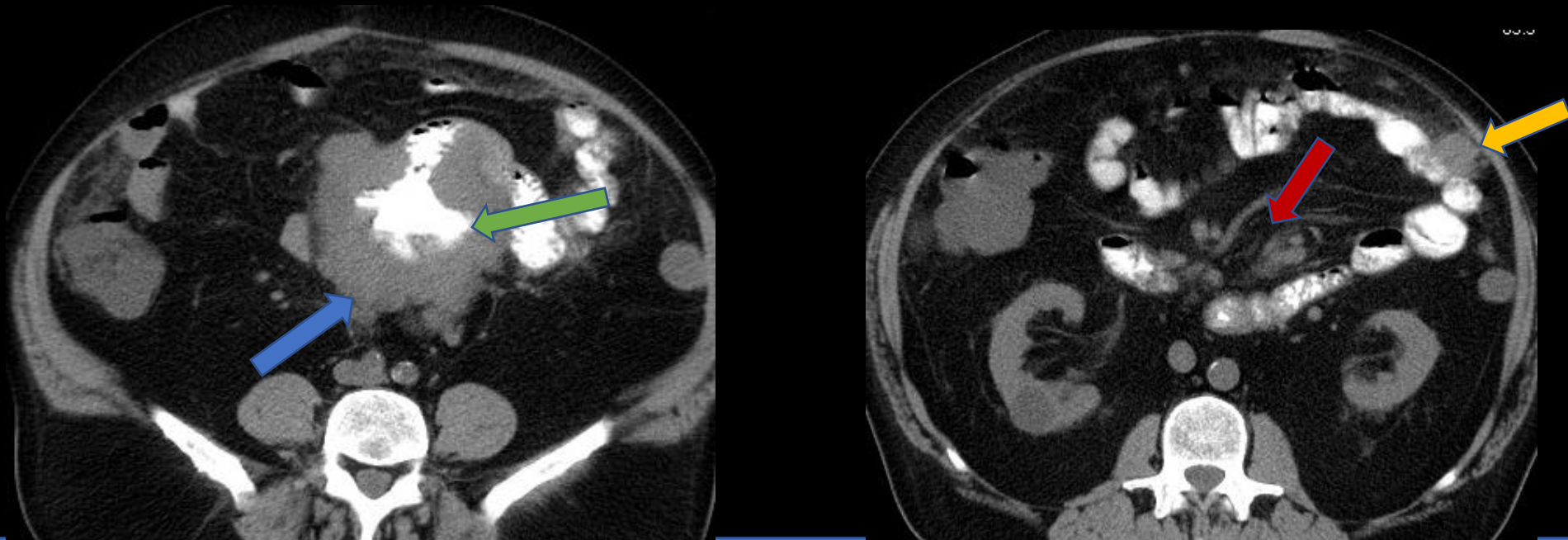


IMAGING: axial MDCT scan with IVC shows a mass (blue arrows) with heterogeneous contrast uptake, focal necrosis and punctate calcifications originating from terminal ileum.

PATHOLOGY: high grade GIST.

“Necrosis and calcifications are findings associated with malignant GIST”.

Case 5: 59 y/o M with AIDS, who presented with anemia and asthenia

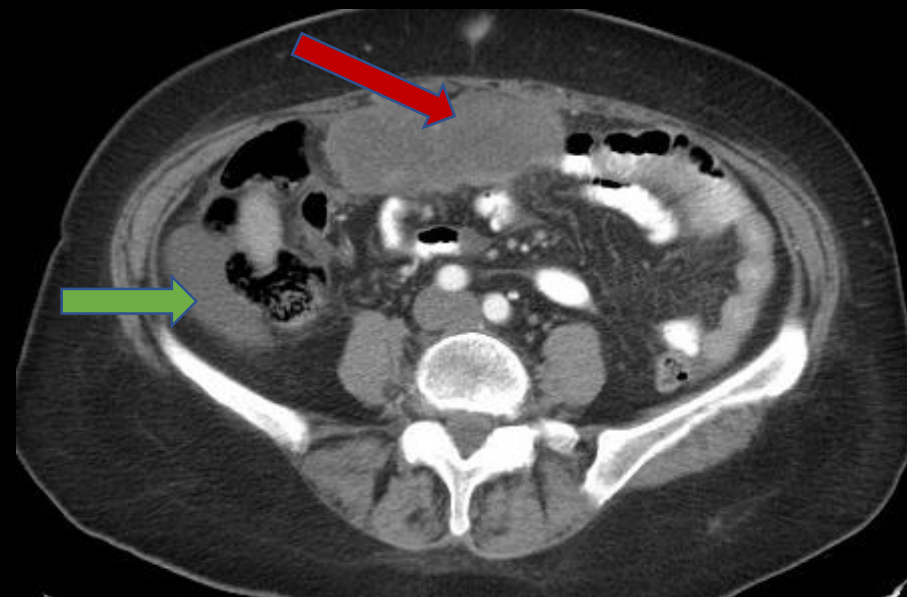


IMAGING: axial MDCT scans without IVC due to renal failure and with positive oral contrast demonstrate a bulky mass encasing the jejunum (blue arrow). Note the marked luminal dilatation (aneurysmal dilatation) (green arrow), a frequent (50%) appearance of lymphoma. MDCT also detected mesenteric adenopathies (red arrow) and a peritoneal implant (yellow arrow).

PATHOLOGY: biopsy-proved Burkitt lymphoma.

“The aneurysmal dilatation helps differentiate lymphoma from adenocarcinoma”

Case 6: 63 y/o F with asthenia, anorexia and weight loss

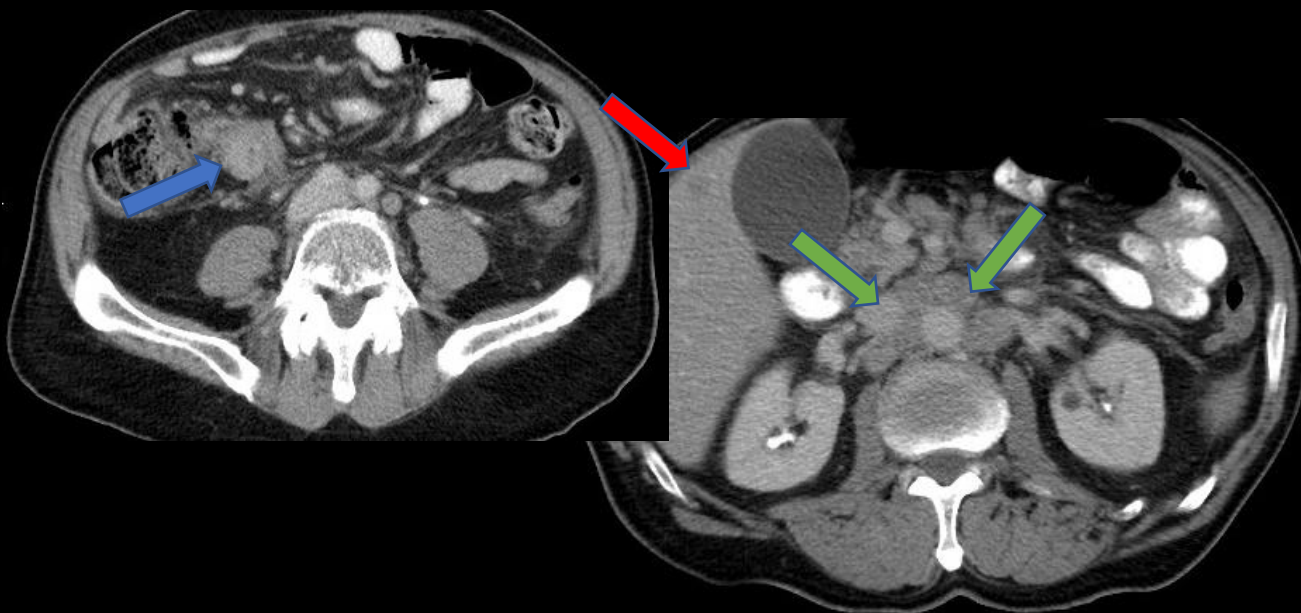


IMAGING: axial MDCT scans with IVC and with positive oral contrast demonstrate an anular mass with marked wall thickening originating from a jejunum loop (blue arrow). Note ascites (green arrows). MDCT also detected a peritoneal implant (red arrow).

PATHOLOGY: adenocarcinoma.

"Jejunal adenocarcinomas at the time of diagnosis most show a fully parietal penetration and involvement of the serosal surface".

Case 7: 66 y/o M with abdominal pain

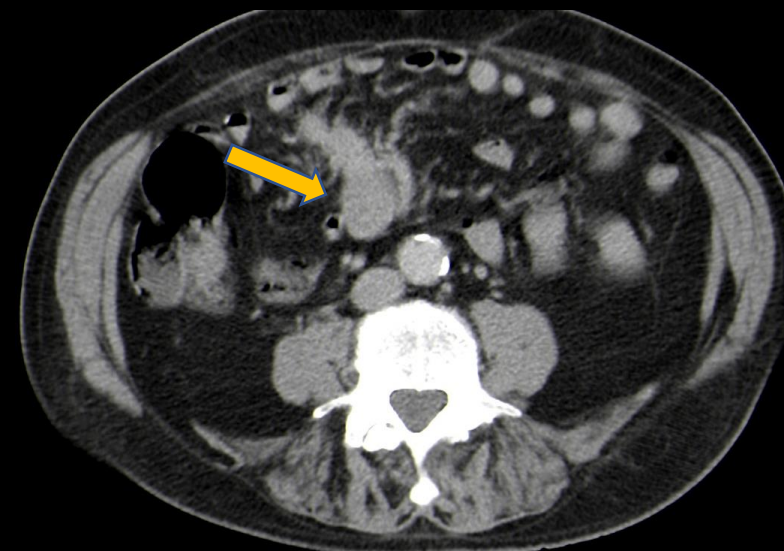


IMAGING: axial MDCT scans show an intravenous contrast-enhancing nodule in the terminal ileum (blue arrow), a hepatic metastasis (red arrow) and multiple retroperitoneal adenopathies (green arrows).

PATHOLOGY: carcinoid tumour

"The slow growth rate is typical but some carcinoid tumours may also be highly invasive"

Case 8: 83 y/o M with melenas

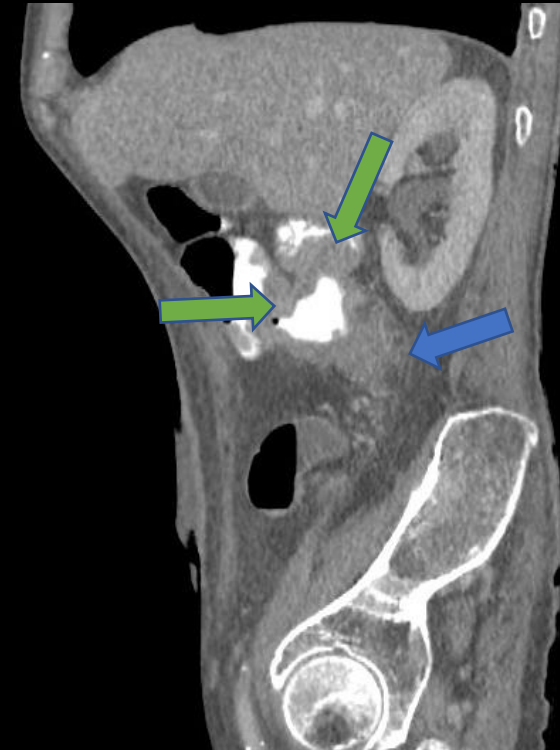


IMAGING: axial MDCT scan demonstrates a spiculated mesenteric mass (yellow arrow).

PATHOLOGY: a small carcinoid tumour in the terminal ileum (not seen in CT) and a mesenteric tumor implant.

"Desmoplastic reaction in a mesenteric mass suggests the diagnosis of carcinoid tumour although calcifications are more specific".

Case 9 : 72 y/o M with asthenia, anorexia, weight loss and vomiting

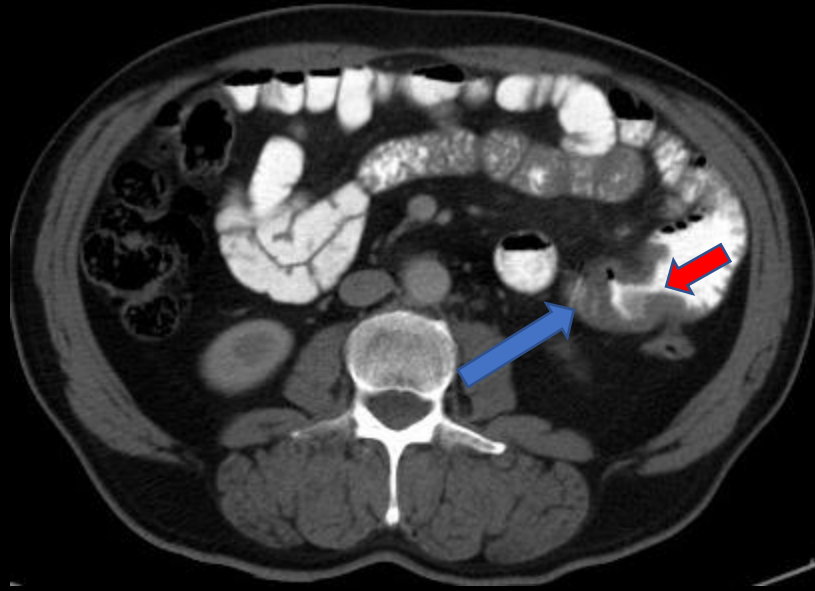


IMAGING: coronal and sagittal reformatting MDCT with IVC and with positive oral contrast show a marked parietal thickening of ascending colon (blue arrows) with infiltration of the duodenum (green arrows).

PATHOLOGY: biopsy-proved infiltration of the duodenal mucosa by a colon adenocarcinoma.

“Local extension into the small bowel from primary pancreatic, biliary, or colonic tumors is not rare.”

Case 10: 59 y/o M with asthenia, weight loss, constipation and abdominal pain

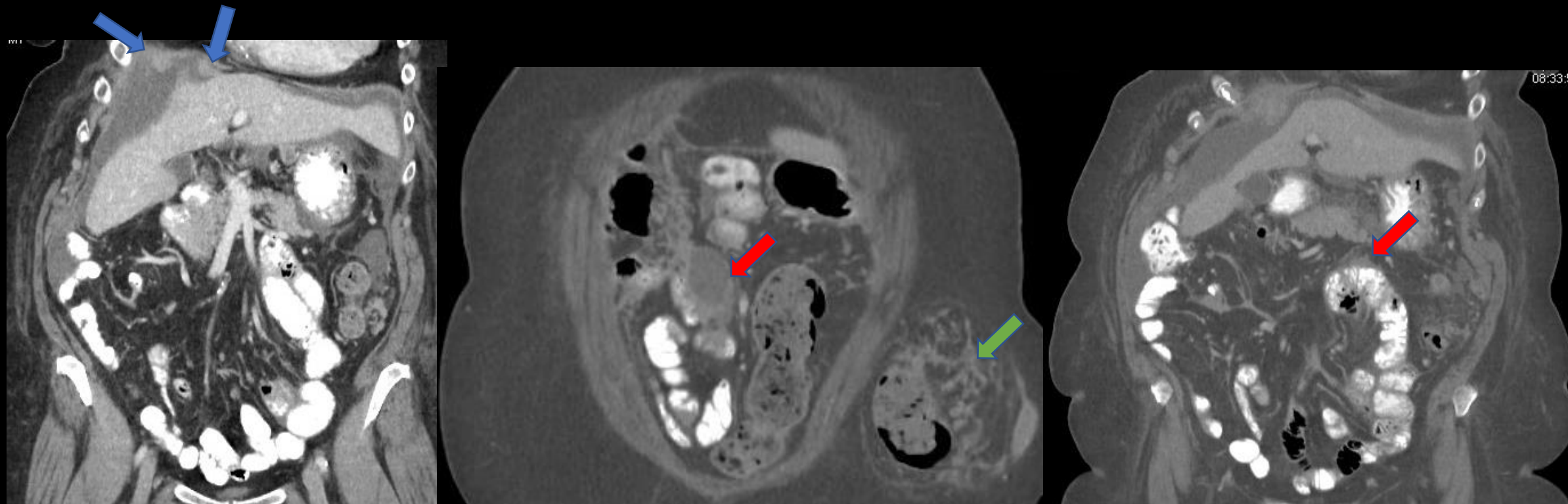


IMAGING: axial MCDT images demonstrate two foci of parietal thickening (blue arrows) arising in the distal jejunum. The first one causes irregular luminal narrowing (red arrow).

PATHOLOGY: metastases of poorly differentiated carcinoma.

"Hematogenous metastases are common. Bronchogenic carcinoma, breast carcinoma, malignant melanoma, and renal cell carcinoma often metastasize to the small bowel via the blood-stream".

Case 11: 76 y/o F with Hartmann-type intervention for an adenocarcinoma of sigma. Control.



IMAGING: coronal reformatting MCDT images demonstrate multiple peritoneal implants on the diaphragmatic surface (blue arrows). Also there are nodular metastases along the small bowel serosa (red arrows) and fat stranding (green arrow). All these findings are compatible with intraperitoneal seeding of sigma adenocarcinoma.

"The most frequently encountered intraperitoneal metastases to the small bowel are primary mucinous tumors of the ovary, appendix, or colon".

CONCLUSIONS

-MDCT is an accurate diagnostic technique for the identification and staging of small bowel tumours.

-Although the differential diagnosis is extensive, various tumours have characteristic features at MDCT that may aid in making a diagnosis.

-MDCT is well suited for making a definitive diagnosis of lipoma and for demonstrating findings suggestive of lymphoma, such as aneurysmal dilatation, or of carcinoid tumour, such as a desmoplastic/calcified mesenteric mass.

-Adequate knowledge of the typical location and histopathology of these tumours is also important for differential diagnosis.

REFERENCES

1. Buckley J, Fishman E. CT evaluation of small bowel neoplasms: spectrum of disease. Radiographics 1998; 18:379-392.
2. Shinya T, Inai R, Tanaka T, et al. Small bowel neoplasms: enhancement patterns and differentiation using post-contrast multiphasic multidetector CT. Abdom Radiol (NY). 2017 Mar;42(3):794-801.
3. Minordi LM, Vecchioli A, Mirk P, et al. Multidetector CT in small-bowel neoplasms. Radiol Med. 2007 Oct; 112(7): 1013-25.
4. Anzidei M, Napoli A, Zini C, et al. Malignant tumours of the small intestine: a review of histopathology, multidetector CT and MRI aspects. Br J Radiol. 2011 Aug; 84(1004):677-90.
5. Kim JS, Park SH, Hansel S, et al. Imaging and screening of cancer of the small bowel. Radiol Clin North Am. 2017 Nov;55(6):1273-1291.

Email for correspondence: mjh@alliancerioja.es