

Diagnosis of an Ischemic Bowel Intussusception

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History

A 9-year-old girl, with a 2-week history of intermittent severe abdominal pain, had undergone an abdominal ultrasound which showed thickened loops of bowel with possible small bowel obstruction. A Dual Energy CT was recommended for further evaluation.

Diagnosis

The axial mixed contrast-enhanced CT images (Figs. 1a and 1c), reconstructed with a 0.5 blend of Sn140 kV and 80 kV data, demonstrated a long, large-caliber, dilated bowel loop representing a small bowel intussusception (ileo-ileal) with a lead mass (Fig. 1c, arrow). The hypo-enhancement of the bowel wall suggested bowel ischemia. The axial (Fig. 1b) and coronal (Fig. 1d) iodine maps show no enhancement of the bowel wall, confirming bowel ischemia. The color mapping is normal in the distal small bowel (Fig. 1d, arrow). Surgery confirmed small-bowel intussusception with ischemic bowel loops. Final pathological studies indicated that the patient had a mucosal hamartomatous polyp acting as the lead point.

Comments

Intussusception is the invagination of a bowel loop with its mesenteric fold (intussusceptum) into the lumen of

contiguous bowel (intussusciens). Intraluminal polypoid lesions have a greater tendency to cause invagination of the bowel. CT is useful to differentiate between lead point and non-lead point intussusception and associated complications, such as bowel obstruction and ischemia which can lead to intestinal infarction if not

diagnosed early. In CT, segmental bowel wall hypo-enhancement is a highly suggestive sign of intestinal ischemia.

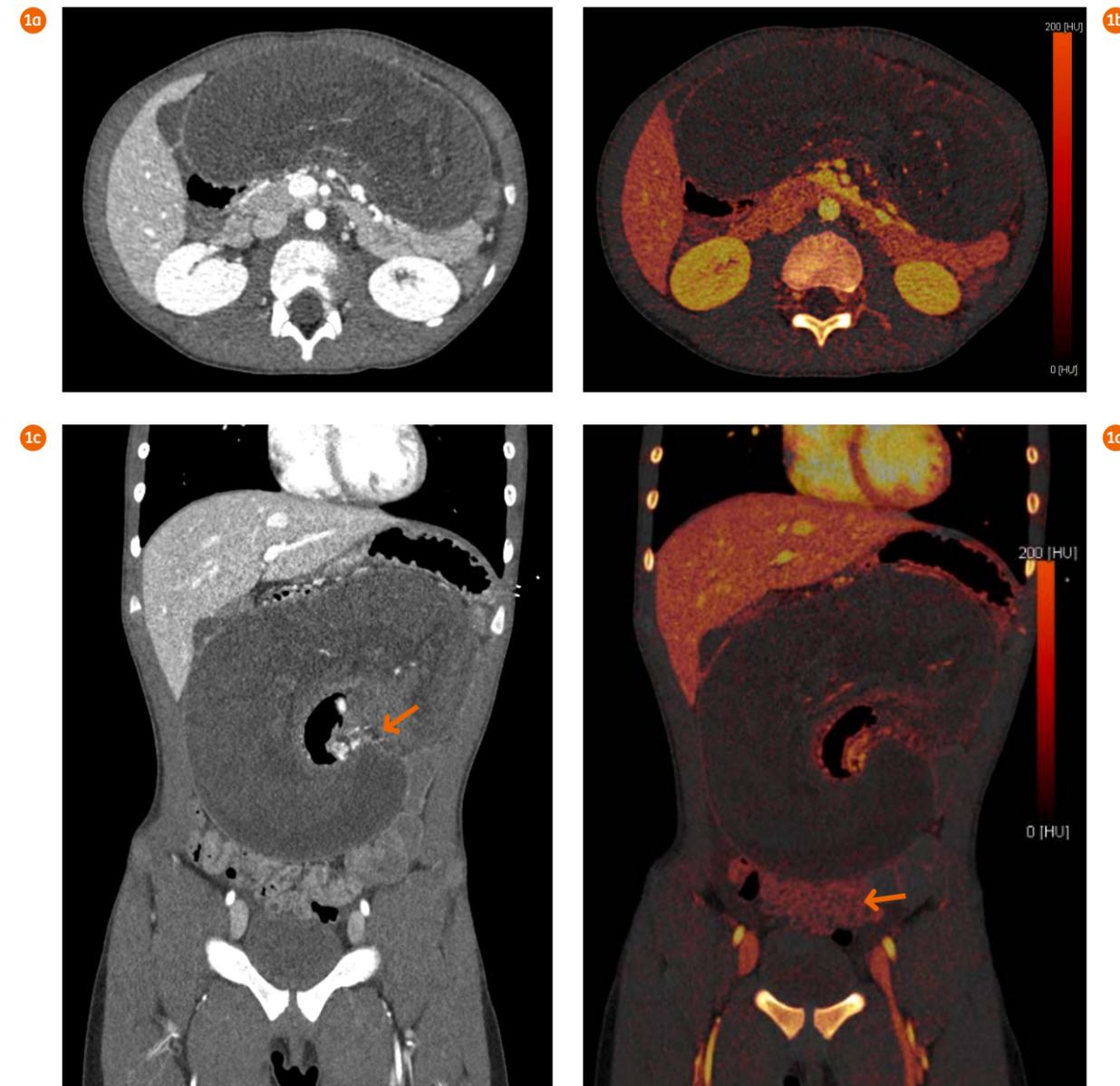
A potential benefit of Dual Energy CT is the possibility of improved visualization of ischemic bowel segments. The use of the iodine map, a technique

Examination Protocol

Scanner	SOMATOM Definition Flash		
Scan area	Abdomen	Rotation time	0.28 s
Scan length	357.7 mm	Pitch	0.8
Scan direction	Cranio-caudal	Slice collimation	128 × 0.6 mm
Scan time	3.3 s	Slice width	0.75 mm
Tube voltage	80 / Sn140 kV	Reconstruction increment	0.7 mm
Tube current	54 / 29 mAs	Reconstruction kernel	Q33f
Dose modulation	CARE Dose4D™	Contrast	320 mg/mL
CTDI _{vol}	2.14 mGy	Volume	100 mL
DLP	85 mGy cm	Flow rate	2 mL/s
Effective dose	3.06 mSv*	Start delay	50 s

*estimated by applying a conversion factor of 0.015, and an additional factor of 2.4 converting the reported DLP (32 cm) into the DLP (16 cm).

The outcomes by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.



1 Axial (Figs. 1a and 1b) and coronal (Figs. 1c and 1d) mixed images (Figs.1a and 1c) and iodine maps (Figs. 1b and 1d) demonstrate a long, large-caliber, dilated bowel loop representing a small bowel intussusception (ileo-ileal) with a lead mass (Fig. 1c, arrow), and no enhancement of bowel wall confirming bowel ischemia. Color mapping is normal in the distal small bowel (Fig. 1d, arrow).

only available when scanning with Dual Energy CT, can allow for increased conspicuity of ischemic segments compared with that of conventional scanning. In this case, the blended images showed intussusception and

hypo-perfused bowel. By using the syngo Dual Energy iodine mapping, it was possible to allow the physician to confirm the absence of iodine concentration in the bowel wall, therefore providing a specific diagnosis of

ischemia. Dual Energy CT technology allows improved diagnostic confidence and also results in a radiation exposure similar to or less than single source CT. ●