Acute massive gastrointestinal bleed detected on contrast enhanced MDCT but missed on initial mesenteric digital subtraction angiogram

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Patient: 24 years, male

Clinical History:

We present a case of a 24-year-old male who had active bleeding with contrast extravasation on contrast enhanced multidetector CT (MDCT), but initial DSA failed to detect site of bleeding. Subsequent super-selective angiographic run, guided by MDCT finding, revealed site of bleeding, enabling successful embolisation.
**Imaging Findings:**

A 24-year-old male with gout on indomethacin was admitted for per rectal bleed and fainting spell. While in the ward, the patient continued to pass out nearly 500 ml of blood clots per rectally and there was a transient drop in blood pressure to 80/60. Emergency contrast enhanced MDCT was performed with a four detector row CT scanner. No oral or rectal contrast was administered. Unenhanced scans and contrast enhanced scans in the arterial phase and 10 min delay were acquired. 120 ml of iodinated contrast was administered at a rate of 3.0 ml/s via an antecubital 18 G venula. Unenhanced CT scans revealed no hyperattenuating material in the bowel lumen (Fig 1a). Arterial phase scan demonstrates hyperdense area from active extravasation of contrast within the lumen at the junction of proximal ascending colon and caecum (Fig 1b). Delayed images showed contrast dilution with antegrade flow of the extravasated contrast into the ascending colon. Emergency mesenteric digital subtraction angiogram (DSA) was carried. Initial superior mesenteric artery (SMA) angiographic runs revealed no obvious active leakage of contrast (Fig 2a). Guided by the contrast enhanced MDCT finding, the catheter was advanced further into the ileo-colic branch and selective angiographic run revealed presence of active contrast extravasation at the junction of proximal ascending colon and caecum (Fig 2b). Super-selective branch occlusion with deployment of embolic coils was performed using 3F micro-catheter. No complication was encountered. Patient subsequently had right hemicolectomy and was found to have NSAID-induced ulcers at the junction of proximal ascending colon and caecum.

**Discussion:**

The diagnostic approach to acute lower gastrointestinal (GI) bleeding remains controversial because of the lack of large prospective controlled data. The diagnostic options for acute lower GI bleed include colonoscopy, enteroscopy, wireless capsule endoscopy, tagged red blood cell scintigraphy and visceral angiography. While there is no large scale head-to-head randomized controlled trail comparing MDCT versus DSA, it is generally believed that DSA is the ‘standard’ in the investigation of choice in lower GI bleed. This is partly fuelled by the fact that DSA has historically been available for this purpose since its advent and for its therapeutic option; partly by the early studies performed on single-detector CT, showing limited success in detecting lower GI bleed (1, 2). The complexity of earlier study (1), for example using intra-arterial injection of a contrast medium through an angiographically catheter positioned near the origin of the celiac trunk prior to CT scan, did not help in promoting this technique. MDCT is an emerging technique in the investigation of lower GI bleed because of its improved spatial and temporal resolution, combined with the tighter iodine contrast bolus achievable with the newer power injectors, seems to eliminate the need for intra-arterial contrast material administration. Initial studies showed promising results (3-5), with several small scale studies showing CT scan may, in fact, be more sensitive to DSA in detecting lower gastrointestinal bleed (6-8). Yoon et al, reported a sensitivity of 90.9% and a specificity of 99% for the detection of acute GI bleeding using multi–detector row CT (3). In animal model, colonic haemorrhage could be detected on MDCT at injection rate of less than 0.3 ml/min (9). This compared to the lower limit of 0.5 mL/min cited for mesenteric angiography, and is comparable to the reported sensitivity of a 99mTc red blood cell examination which ranges from 0.04 to 0.2 mL/min. Section thickness may be another reason that MDCT is more sensitive for detection of extravasations of contrast compared to DSA. The section thickness for each slice of MDCT is 3mm. In contrast, an image in DSA is a thick slab that includes the whole thickness of the patient’s body. Many patients presenting with lower gastro-intestinal bleed resolve spontaneously, and vasospasm or intermittent clotting contribute to false negative examinations (10). DSA studies frequently yielded negative results. Arteriography is positive in only 40% to 70% of patients with clinical evidence of active bleeding (11,12). MDCT can easily be repeated. A negative MDCT avoid a DSA study which is an invasive study with its associated complications, and may be reassuring that spontaneous haemostasis has occurred. Conversely, a positive MDCT study MDCT can pin-point the site of active bleed non-invasively. This information guide interventional radiologists to perform selective angiographic runs, saving time and minimizing radiation dose to the patient.

**Differential Diagnosis List:** MDCT is useful investigative tool in management of patient with gastrointestinal bleed.
Final Diagnosis: MDCT is useful investigative tool in management of patient with gastrointestinal bleed.

References:


Description: Fig. 1. (a) Axial unenhanced CT image without oral or rectal contrast administration through the right lower quadrant of the abdomen, showed fluid-filled bowel loops without high attenuating material. Origin:
**Description:** Fig. 1. (b) Contrast-enhanced axial CT scan at the same transverse level, showed high-attenuating extravasation of contrast material (arrows) in the lumen at junction of proximal ascending colon and caecum. **Origin:**
Description: Fig. 2. (a) Superior mesenteric artery angiographic runs revealed no obvious active leakage of contrast. Origin:
Description: Fig. 2. (b) The catheter was advanced further into the ileo-colic branch (open arrow) and selective angiographic run revealed presence of active contrast extravasation at the junction of proximal ascending colon and caecum (arrow). Super-selective branch occlusion was subsequently performed using 3F micro-catheter, with deployment of embolic coils to achieve haemostasis. Origin: