Intern Emerg Med (2013) 8:263–264
DOI 10.1007/s11739-012-0897-3

CE - MEDICAL ILLUSTRATION

Classic signs of closed loop bowel obstruction

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Received: 5 December 2012 / Accepted: 21 December 2012 / Published online: 20 January 2013

Case

A 75-year-old man presented to this hospital with abdominal pain. The patient described the sudden onset of: left lower quadrant pain nine-out-of-ten in severity, associated with multiple episodes of bilious vomiting. The patient had not had a bowel movement in 4 days. Physical examination was notable for tenderness to palpation and guarding in the left lower quadrant. Computed tomography of the abdomen and pelvis without contrast material was completed, and demonstrated a closed-loop bowel obstruction involving an ileal loop (Figs. 1, 2). The patient underwent an exploratory laparotomy, which confirmed an ischemic closed-loop obstruction. A small bowel resection was performed (Fig. 3), and the patient recovered uneventfully.

Discussion

A closed-loop obstruction is a mechanical obstruction in which a single segment of bowel is obstructed at two locations (Fig. 4) [1–4]. Adjacent segments may form a narrow pedicle, leading to rotation, twisting, and volvulus formation (Fig. 5) [2]. Such obstructions are most frequently caused by adhesions, and less commonly by herniations [2].

As demonstrated in this case, computed tomography frequently reveals a 'C-shaped' configuration of dilated, fluid-filled bowel with twisting mesenteric vessels converging toward the site of obstruction [3, 4]. A 'beak sign' or tapering of the bowel at the point of obstruction or a 'whorl sign' reflecting rotation of the bowel around a fixed obstruction may be observed [3, 4]. Signs of strangulation include lack of mural enhancement after contrast administration, mural thickening, surrounding mesenteric fluid, and pneumatosis intestinalis [5].

A closed-loop obstruction is a surgical emergency and requires urgent laparotomy.

Conflict of interest None.

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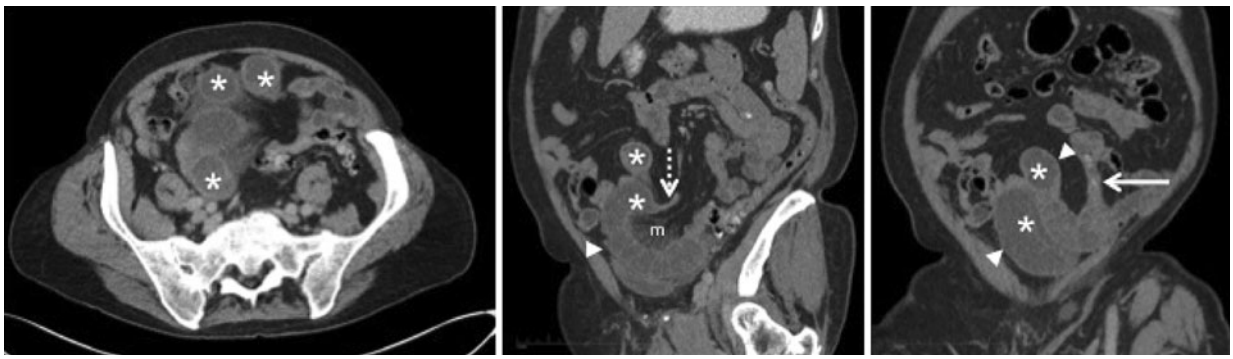

Fig. 1 Axial, oblique coronal, and coronal images from computed tomography without intravenous or oral contrast material demonstrating adjacent dilated loops of small bowel in the left lower abdomen (*asterisk*) with proximal (*solid arrow*) and distal (*dotted arrow*) transition points, consistent with a closed-loop bowel obstruction. Wall thickening (*arrowheads*) and mesenteric congestion (m) suggest ischemia

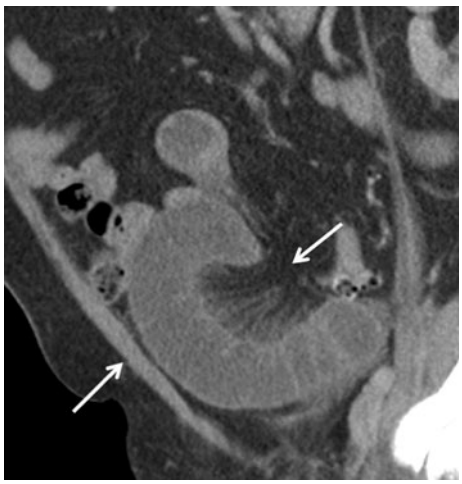

Fig. 2 Sagittal oblique reformatted image demonstrating the closed-loop bowel obstruction (*arrows*)

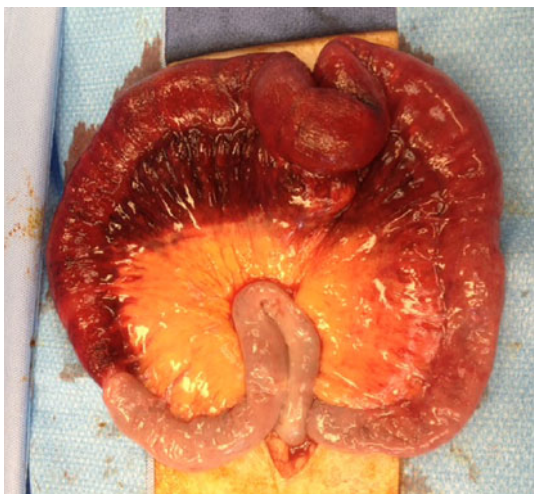

Fig. 3 Single intraoperative photograph demonstrating a grossly ischemic small bowel with the closed-loop obstruction

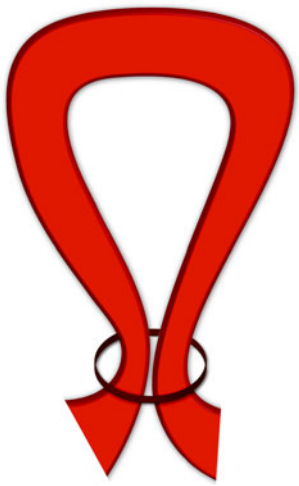

Fig. 4 Schematic diagram demonstrating a single segment of bowel obstructed at two adjacent locations, consistent with a closed-loop obstruction

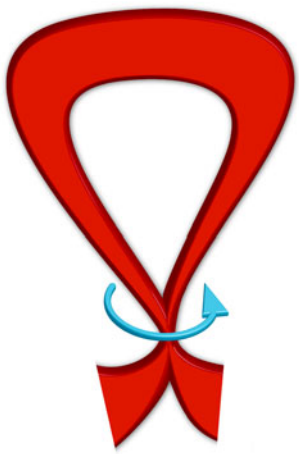

Fig. 5 Schematic diagram demonstrating the formation of a narrow pedicle leading to rotation, twisting, volvulus, and strangulation