

Imaging diagnosis

Case 444

3. Sigmoid colon perforation with colon cancer

【Progress】

He received endoscopically Hamalton operation that revealed edematous mesentery and mesentery-sided sigmoid colon perforation. Stoma using sigmoid colon was created. Later, he was scheduled to receive radical treatment for rectum-sigmoid colon cancer and cecal cancer.

【Discussion】

Sigmoid mesentery that contains internal vessels (artery, vein, lymphatic), expands and extends like an inverted V configuration from the top of left common iliac artery level to the sigmoid serosa. The surface of the sigmoid mesocolon faces to peritoneal space. However, intra-mesenteric space exists and does not face to peritoneal space, but retroperitoneal space or extraperitoneal space.

The boundary between sigmoid colon and rectum varies in human. It is documented that the sigmoid colon mesentery adheres to the posterior abdominal wall at S2 level near the origin of common iliac artery bifurcation (1, 2).

Serosa means the adhesion of mesentery. When sigmoid colon perforation occurs with breakdown of the sigmoid colon mesentery or sigmoid serosa, perforated free air move to peritoneal cavity such as subphrenic or subhepatic spaces. When sigmoid colon perforation occurs at the side of mesentery itself or no breakdown of serosa, air bubbles do not move to peritoneal space but move to mesentery itself, concretely, intra-mesenteric peri-vessels space. Mesenteric peri-vessels space communicates to peri-inferior mesenteric artery space, inferior mesenteric vein space, and para-abdominal artery space.

In our case, air bubbles perforated from mesenteric side of sigmoid colon mural fulfill in the sigmoid mesocolon, move to peri-inferior mesenteric artery and vein, and para-aortic space. Further, air bubbles in the para-aortic space shift to peri-left psoas muscle space. Air bubbles from peri-left psoas muscle space shift to peri-renal space and posterior pararenal space.

Sigmoid colon perforation occurs from origins of diverticulitis, cancer, fecal impaction or unknown. Colon diverticulum rarely occur at the liked site of mesocolon and then, perforations originated from diverticulitis most happen at the colon sites without mesocolon adhesion, inducing free air in peritoneal space, while perforation from mesocolon liked mural does not cause peritoneal free air but cause extraperitoneal free air like in our case whose air bubbles were found in: whole sigmoid mesocolon, spaces of peri inferior mesenteric vessels, para-abdominal aortic, peri-psoas muscle, perirenal, posterior pararenal, peri-left psoas muscle, peri-left common iliac artery that the apex of sigmoid mesocolon.

It is thought that there are two extraperitoneal spaces that usually collapse: one, intra-sigmoid mesocolon, and another, not related with intra-sigmoid colon, is the loose fascia in the extra-peritoneal spaces (3-7) that usually collapse in the healthy person reported in Case 395 in this series.

【Summary】

We presented a seventy-four-year-old male presented with abdominal pain. Air bubbles in the sigmoid mesocolon itself, shift to paraaortic space via inferior vessels space and communicate with peri-left psoas muscle space, perirenal space and posterior pararenal space. It is borne in mind that in the pelvis, there are two-types extraperitoneal spaces: one intra-mesocolon and loose fascia. These spaces are demonstrated in sigmoid colon perforation originated from sigmoid mesocolon itself in this case and another, in descending colon perforation demonstrated in Casse 395.

【References】

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