

Clinical diagnosis

Case 233

3. Perforation of sigmoid colon

【Progress】

She underwent partial sigmoid colectomy under open surgery, Macroscopic findings revealed sigmoid colon perforation at just oral side of sigmoid colon cancer.

【Discussion】

Rectum is anatomically categorized into rectosigmoid (RS), rectum a (Ra) and rectum b (Rb). RS portion is a portion from sacrum promontory to lower margin of sacrum 2; Ra from lower margin of sacrum 2 to bottom of peritoneal space (peritoneal reflection); Rb from bottom of peritoneal space to anus. In our case, free air was found in retroperitoneal space. The location of the perforation was sigmoid 10 cm above the bottom of peritoneal space, indicative no relation with Rb. Pelvic retroperitoneal space includes the sites of psoas muscle and ureter. Further it includes pre vesical space, para vesical space and para sacrum space. In our case, free air does not relate to these spaces but to great vessels. How do air bubbles arisen from sigmoid perforation enter retroperitoneal space ?

The sigmoid mesocolon forms an inverted V-shaped configuration and the apex attaches to the bifurcation point of the external and internal of the left common iliac artery. The sigmoid mesocolon suspend the sigmoid colon and attaches to the dorsal abdominal wall: the lateral limb descends along with the left major psoas muscle and the medial limb descends and ends at the level of the third sacrum vertebrae. The role of mesocolon carries vessels, nerves and lymphatics. The sigmoid colon branch of internal mesenteric artery comes from the apex of sigmoid colon to sigmoid mesocolon. IMA stem itself belongs to retroperitoneal space and its branches enter sigmoid mesocolon and descending mesocolon. Sigmoid colon is wrapped by mesocolon and the serosa of sigmoid colon implies mesocolon. Axial cut of sigmoid colon should demonstrate the serosa covers the entire sigmoid wall including the adhesion portion of serosa or mesocolon. When sigmoid perforation occurs except the reflection site, perforated air bubbles should go into peritoneal cavity (1-4), while it occurs at the reflection site, air bubbles go upwards via mesocolon itself, reach the apex of mesocolon and enter the space of IMA stem. That is why air bubbles in our case were not found into peritoneal cavity but in the space of greater vessels, namely retroperitoneal space.

Retroperitoneal spaces are categorized into anterior pararenal space, perirenal space and posterior para renal space (5, 6). But in our case, air bubbles do not into these spaces but greater vessels space. Recent studies describe the concept of these three spaces does not always reflect the dynamics of the lesion and propose the concept of the plane (7-9). Based on the lesion expansion or infiltration, the boundary between anterior pararenal space and perirenal space exist retro-mesenteric plane, the boundary of perirenal space and posterior pararenal space exist retro-renal plane. Further, lateral

conal plane and subfascial plane are added. Greater vessel spaces belong to the retrorenal plane. In pancreatitis, abdominal aortic rupture, retroperitoneal abscess, the real clinical lesions infiltrate these planes rather than the past three spaces.

【Summary】

We presented an eighty three-year-old female suffering from fever, abdominal pain and bloody diarrhea. Non-enhanced CT showed air bubbles along sigmoid colon wall and greater vessels, mimicking pneumo-cystoides intestinal but the intraperitoneal surgery revealed sigmoid colon perforation to retroperitoneal space. Perforation site arose from sigmoid colon where it situates in peritoneal cavity. It is borne in mind that sigmoid colon initiates from the end of descending colon to the lower level of S 2. Rectum a (Ra) indicates from lower level of S2 to the bottom of peritoneal cavity and Rb, from the bottom of peritoneal cavity to anus. Although sigmoid colon is one of the peritoneal organs, perforation of sigmoid colon can enter retroperitoneal space. In short, air bubbles arisen from perforation of sigmoid colon at the reflection site of sigmoid mesocolon can enter mesocolon itself and ascend to the IMA stem site via sigmoid branch arteries wrapped by sigmoid mesocolon. Based on the infiltration of pancreatitis, abdominal aorta rupture and/or retroperitoneal abscess, the concept of retroperitoneal spaces are taking place of planes; the border of anterior pararenal space and perirenal space includes retro-mesenteric plane; the border between perirenal space and posterior pararenal space includes retro-renal plane: lateral conal plane and sub fascial plane are added.

【References】

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