

Imaging diagnosis

Case 450

4. Strangulation ileus > 3. NOMI (non-occlusive mesentery ischemia)

【Progress】

He took open laparostomy that revealed strangulation ileus associated with small bowel necrosis.

【Discussion】

Despite of strangulation ileus confirmed by laparostomy, the imaging diagnosis before surgery could not reach the exact diagnosis of strangulation ileus but misdiagnosis of local non-occlusive mesenteric ischemia (NOMI). It is simply because neither double beak sign nor double knot sign was found out in the image interpretation of non-enhanced or contrast-enhanced CT. No emboli of superior mesenteric artery were not delineated on contrast-enhanced, indicative of no evidence of embolism from cardiac fibrillation, misleading diagnosis of local NOMI. The final image interpretation after surgical treatment making exact diagnosis of strangulation ileus resulted in the notice of double-knot sign on only single slice of non-enhanced axial CT or enhanced coronal CT. The real cause of NOMI is yet to be clarified. It is hypothesis that NOMI arises to preserve the circulation of critical organs of brain and heart by sacrificing of mesenteric arterial blood flow, inducing spasm of superior mesenteric artery (SMA) branches spasms, leading necrosis of mesentery and bowels (1). Superior mesenteric vein (SMV) sign is known to appear in case of NOMI that lowering SMA blood flow causes the less blood flow of mesenteric vein (1). In this case, small SMV sign was not found out.

The rough interpretation made the presence of double knot sign or double the beak sign miss to find out. Double knot sign was demonstrated on only one single axial image at the first day, while both of double knot sign on an axial image and double beak sign on coronal image was demonstrated at the second day, the attentive interpretation is required for the exact image diagnosis of strangulation ileus.

Another critical point is that the uncertain configuration of double knot or double beak might appear in the situation of more tightening clamp rather than in the situation certain double beak sign because of strong tightening causing disappearance of beak sign (2-8). Double knot sign might be more useful for finding out strangulation ileus than double beak sign. When you cannot find out the certain findings of direct strangulation ileus sign, the secondary indirect findings of strangulation ileus such as whirl sign, mesenteric edema, small bowel feces sign are useful (2-8).

In our case, there are secondary signs of strangulation ileus different from NOMI such as small bowel feces sign and mesenteric edema, despite that direct signs of strangulation ileus such as double beak sign or double knot sign were not found out. Then, when secondary signs are present, the attentive interpretation is required for strangulation ileus simply because the appendix was not demonstrated in the situation of our case.

【Summary】

We presented an eighty-one-year-old male presented with abdominal pain. Small bowel dilatation with small bowel sign and mesenteric edema was depicted on abdomen CT. At first, direct signs of double knot sign or double beak sign were not certainly found out but after laparostomy, the double knot sign was found out on a single slice of axial CT by the attentive interpretation.

It is borne in mind that although direct signs of strangulation ileus such as double knot sign or double beak sign are uncertain, the presence of indirect signs of small bowel sign, mesenteric edema, indicates the attentive interpretation to find out double knot sign or double beak sign.

【References】

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