CT aids diagnosis of metastatic tumors in GI tract

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Familiarity with CT findings of blood-borne metastases in the gastrointestinal tract and with the pattern of disease spread in common primaries assists in the detection of metastatic disease. It can also help radiologists avoid mistaking metastasis for another metachronous malignancy, according to a presentation by Korean researchers at the European Congress of Radiology in March.

Blood-borne metastases in the GI tract are rarely observed in patients with malignancies. Most lesions arise from malignant melanoma and carcinoma of the breast or lung, and they most commonly involve the stomach and small bowel because of their rich blood supply, said Dr. So Yeon Kim, a radiologist at Asan Medical Center, University of Ulsan College of Medicine in Seoul. GI metastases are often encountered in patients with widespread metastases and known primary lesions, but they occasionally present as the initial manifestation of an occult primary lesion, creating a potential diagnostic problem.

"The radiologic appearance of a hematogenous GI metastasis mainly depends on the histologic characteristics of the lesion, including the degree of vascularity relative to the growth rate and the desmoplastic capability. It has been described as an intramural mass, a mesenteric mass with secondary invasion of the bowel wall, and bowel wall thickening and rigidity," Kim said.

Malignant melanoma accounts for about one-third of all metastases in the GI tract. The small bowel is the most common site of GI tract involvement; small bowel metastases are found in up to 58% of patients with malignant melanomas, Kim said. Gastric metastases occur less frequently, in about 20% to 40% of cases.

Patients with metastatic malignant melanomas in the stomach or small bowel may present with nausea and vomiting, epigastric pain, weight loss, and GI bleeding. Many metastatic melanomas in the small bowel act as leading points for intussusceptions and result in small bowel obstruction.

"Metastatic gastric and duodenal melanomas classically appear as multiple small submucosal nodules that may ulcerate to produce the well-known 'target' or 'bull's-eye' lesions on barium studies," Kim said. "They may be seen as diffuse bowel wall thickening or intraluminal polypoid masses on CT scans."

Small bowel lesions are categorized as polypoid, cavitary, infiltrating, or exoenteric lesions, and radiologic patterns usually reflect the pathologic features of these tumors. Because hematogenous deposition generally occurs in the submucosal layer, it may be seen early as small mural nodules on luminal studies, according to Kim. Hematogenous dissemination often causes multiple metastatic lesions of variable size.

"Small polypoid lesions are rarely seen on CT, but larger lesions may be seen as intraluminal masses, often with intussusceptions," he said. "Central ulceration is especially common as the metastasis outgrows its blood supply. Usually, there is no significant desmoplastic response, yielding an appearance of cavitary lesion on CT."

If the submucosal metastasis grows slowly, on the other hand, it may be seen as an infiltrating lesion, possibly through local lymphatic spread. The serosal metastatic deposits can result in a cavitary or exoenteric appearance on CT.

Lung cancer metastases to the small bowel often present clinically as intestinal perforation. Small bowel perforation is a more frequent result of metastasis from lung cancer than from other primaries. These tumors may undergo necrosis, although the exact pathogenesis of the perforation is not clearly understood, Kim said.

Uncommon malignancies that can metastasize in the GI tract include renal cell carcinoma (RCC), hepatocellular carcinoma, and choriocarcinoma. Although metastases may develop in more than 60% of patients with RCC, GI metastases are uncommon. The most common clinical presentation of metastatic RCC is GI bleeding and/or obstruction. Metastatic RCC in the GI tract typically presents as a solitary, bulky, and hypervascular lesion on cross-sectional imaging, Kim said.