

RADIOGRAPHIC QUIZ From pages 8-9

■ BRIEF OVERVIEW OF THE DISEASE.

Colorectal cancer is the most common cancer of the gastrointestinal tract and the second most frequently diagnosed malignancy in adults that results in significant morbidity and mortality.

Colorectal cancer is common, accounting for 15% of all newly diagnosed cancers, and tends to be a disease of the elderly, with the median age of diagnosis between 60 and 80 years of age, slightly younger for rectal cancer. There is also a slight male predilection for rectal cancers, not found in tumors elsewhere in the colon.

■ RISK FACTORS

A number of predisposing factors have been identified, including:

- low fiber and high fat and animal protein diet
- obesity (especially in men)
- inflammatory bowel disease (IBD)
 - ulcerative colitis
 - Crohn disease (particularly in bypassed loops/in vicinity of chronic fistula)
- asbestos exposure
- a family history of benign/malignant colorectal tumors
- history of endometrial/breast cancer
- pelvic irradiation
- uretersigmoidostomy
- colonic adenoma
- dysplasia of colon within flat mucosa
- prominent lymphoid follicular pattern

■ CLINICAL PRESENTATION

Clinical presentation is typically insidious:

- altered bowel habit (constipation and/or diarrhea)
- iron-deficiency anemia (chronic occult blood loss)

However initial manifestation may be acute:

- bowel obstruction
- intussusception
- heavy rectal bleeding

LESS COMMON PRESENTATIONS INCLUDE:

- that of metastatic disease (e.g. respiratory symptoms from lung metastases)
- paraneoplastic syndromes (e.g. dermatomyositis)
- bacteremia or bacterial endocarditis with *Streptococcus bovis* (*Streptococcus gallolyticus*)

In general:

- right-sided tumors are larger and present with a mass, distant disease or iron deficiency anemia
- left-sided tumors present earlier with altered bowel habit

LOCATION

Colorectal cancers can be found anywhere from the cecum to the rectum, in the following distribution:

- rectosigmoid: 55%
- cecum and ascending colon: ~20%

ileocecal valve: 2%

transverse colon: ~10%

- descending colon: ~5%

METASTASES

The liver is the predominant organ to be involved with metastases from colorectal cancer; thus, accurate imaging of the liver is essential. CT has an established role in the detection of hepatic metastases in patients with a variety of primary tumors, including colorectal cancer.

At CT, hepatic metastases usually appear as hypoattenuating masses, which are best visualized during the portal venous phase of liver enhancement. Mucinous colorectal cancer can produce cystic or calcified hepatic metastases. The metastases can vary widely in size.

Sites of distant metastasis are influenced by the venous drainage of the primary site. For instance, the venous drainage of the colon and upper rectum is via the portal vein, and thus the liver is a common site of metastases. However, the lower rectum has a dual drainage. The superior hemorrhoidal vein drains into the inferior mesenteric vein and then into the portal vein to the liver. The middle and inferior hemorrhoidal veins, however, drain into the pelvic veins and then directly into the inferior vena cava. This drainage pattern explains why distal rectal cancer can produce isolated pulmonary metastases without hepatic metastases. Other common sites of metastases from colon cancer include the lungs, adrenal glands, and bones. Mucinous adenocarcinoma of the colon can also cause widespread intraperitoneal metastases, which can be detected with CT, however, intraperitoneal metastases can be detected at CT only if they produce thickening of the peritoneal surfaces or peritoneal nodules. Microscopic seeding of the peritoneal surfaces will not be detected.

■ RADIOLOGICAL STUDIES

ULTRASONOGRAPHY

A primary colon tumor typically appears as an echo-poor mass with a hyperechoic center, which is known as the target sign. Other findings include localized irregular colon wall thickening, an irregular contour, lack of normal peristalsis, and an absence of the normal layered appearance of the colon wall.

Intussuscepting colon tumors have a characteristic target like appearance from concentric rings of soft tissue and mesenteric-fat density.

COMPUTER TOMOGRAPHY

Abdominal computed tomography (CT) is valuable in planning surgery for colon cancer because it can demonstrate regional extension of tumor as well as adenopathy and distant metastases. At CT, colorectal cancer typically appears as a discrete soft-tissue mass that narrows the colonic lumen. Colorectal cancer can also manifest as focal colonic wall thickening and luminal narrowing. Complications

Answer to Radiographic Quiz

of primary colonic malignancies such as obstruction, perforation, and fistula can be readily visualized with CT. At CT, local extension of tumor appears as an extra colic mass or simply as thickening and infiltration of pericolic fat. Extra colic spread is also suggested by loss of fat planes between the colon and adjacent organs. The liver is the predominant organ to be involved with metastases from colorectal cancer. At CT, hepatic metastases usually appear as hypoattenuating masses, which are best visualized during the portal venous phase of liver enhancement. Use of CT is critical for identifying recurrences, evaluating anatomic relationships, documenting "normal" postoperative anatomy, and confirming the absence of new lesions during and after therapy.

Given the prevalence of colon cancer the role of CT in preoperative staging, treatment planning, and postoperative follow-up, the radiologist should be familiar with the CT appearance of colon cancer.

MAGNETIC RESONANCE IMAGING

MRI has roles in staging of rectal tumors and in assessment of liver metastases in colorectal carcinoma. Before the introduction of high field-strength magnets and endorectal or phase array coils, CT was considered superior to MRI for local staging of rectal cancer. Although no advantage has been yet found in the use of 3-Tesla field-strength imaging in comparison to 1.5-Tesla in tumor staging of rectal cancer, MRI has now been shown to be able to reliably exclude T3 tumors with a negative predictive value of 97%.

One notable pitfall is the difficulty with differentiating a desmoplastic reaction in the perirectal fat (T2) and true tumor infiltration (T3), although in practice it may not change therapy.

Preoperative MRI is also used to identify tumor distance from the mesorectal fascia, which is a predictor of tumor positivity at the circumferential resection margin (CRM) after a total mesorectal excision. A positive resection margin is defined as tumor extension to within 1 mm of the mesorectal fascia.

■ REFERENCES:

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cancer imaging. Apr 16, 2021

2. Dr MT. Niknejad. Radiopaedia. Colorectal cancer. 07 Aug 2022

3. Karen M. Horton, Ross A. Abrams, Elliot K. Fishman. Spiral CT of Colon Cancer: Imaging Features and Role in Management. Radiographic. March 1, 2000

Description of the images

Ultrasound: Mass of mixed echogenicity with hyperechoic center which produces acoustic shadow (gas) known as false kidney image compatible with a colonic tumor.

Hypoechoic mildly lobulated hepatic mass

CT scan: Soft tissue mass that narrows the transverse colonic lumen

Hypodense hepatic lesion probably related with a metastasis

Regarding to ultrasound images which organs are affected

- Liver and kidney
- Stomach and kidney
- Liver and colon
- Stomach and liver

The ultrasound findings are compatible with:

- Colon cancer and liver metastasis
- Renal mass and liver metastasis
- Stomach mass and liver cyst
- Stomach mass and kidney malformation

Regarding to tomographic images which is the best description for the findings showed

- Soft tissue density that narrow the bowel lumen
- Hyperdense mass with focal calcifications
- Multiseptated mass
- Soft tissue density that narrow the bowel lumen and hypodense hepatic mass

What is your diagnostic?

- Gastric carcinoma and hepatic cyst
- Hepatocellular carcinoma and abdominal abscess
- Colon cancer and hepatic metastasis
- Pancreatic mass and hepatic metastasis