Imaging for Colorectal Cancer

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KEYWORDS

• Imaging • Colorectal cancer • MRI • Endorectal ultrasonography • CT

KEY POINTS

- Plain films and abdominal ultrasonography have limited roles in modern staging of colorectal cancer.
- Patients are often referred for surgery with inadequate imaging, and it is the surgeon's responsibility to ensure proper preoperative staging.
- Rectal cancer requires additional local staging with endorectal ultrasonography or pelvic MRI to determine whether neoadjuvant chemoradiation will be beneficial.
- After curative resection, yearly computed tomography scans of the chest, abdomen, and pelvis are recommended for most patients.

INTRODUCTION

A comprehensive approach to colorectal cancer includes thorough radiologic imaging, which allows appropriate initial staging of the disease, as well as subsequent surveillance for disease recurrence. Several imaging modalities are used with different associated advantages and disadvantages. This article provides an overview of appropriate modern imaging in the evaluation of colon and rectal cancer. Recommendations mirror those of the American Society of Colon and Rectal Surgeons (ASCRS)[1–3] as well as the National Comprehensive Cancer Network (NCCN).[4,5]

DIFFERENT IMAGING MODALITIES

Plain Films

Before the widespread adoption of more capable imaging modalities, plain films were the mainstay of diagnosis and staging for colorectal cancer. However, its role in

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modern medicine has diminished. In general, plain films do not possess adequate sensitivity for the identification of primary and metastatic lesions, so they are only useful when the findings are advanced and dramatic.

Chest radiographs (CXRs) can be used to detect pulmonary lesions, which may represent primary or malignant tumors. However, the sensitivity for detection of colorectal metastases is poor.[2] One retrospective review found that CXR detected only 36.7% of pulmonary metastases.[6] Abdominal radiographs may be useful for identification of the large bowel obstructions that can occur from a locally advanced primary tumor (**Fig. 1**). Abdominal films can be aided by the administration of Gastrografin to better identify the offending tumor (**Fig. 2**).

Ultrasonography

Ultrasonography of the abdomen has a low sensitivity for primary tumors. Its main historical significance was for the detection of liver metastases. Several important studies on staging and surveillance of colorectal cancer, including the GILDA (Gruppo Italiano di Lavaro per la Diagnosi Anticipata) trial,[7] used ultrasonography as the primary method for detecting liver lesions. However, current guidelines have abandoned abdominal ultrasonography in favor of computed tomography (CT) because of its increased sensitivity and reproducibility. Endorectal ultrasonography remains an important element in the local staging of rectal cancer, and it is discussed in greater detail later in this article.

Computed Tomography

CT has become a mainstay in the diagnosis and staging of colorectal cancer. It can be used to assess the location and extent of the primary tumor (**Fig. 3**), involvement of adjacent organs, enlargement of regional and distant lymph nodes, and the presence or absence of metastatic disease. CT is the most common modality used to stage colorectal hepatic metastases.[8] With the advent of helical CT (also called spiral CT),

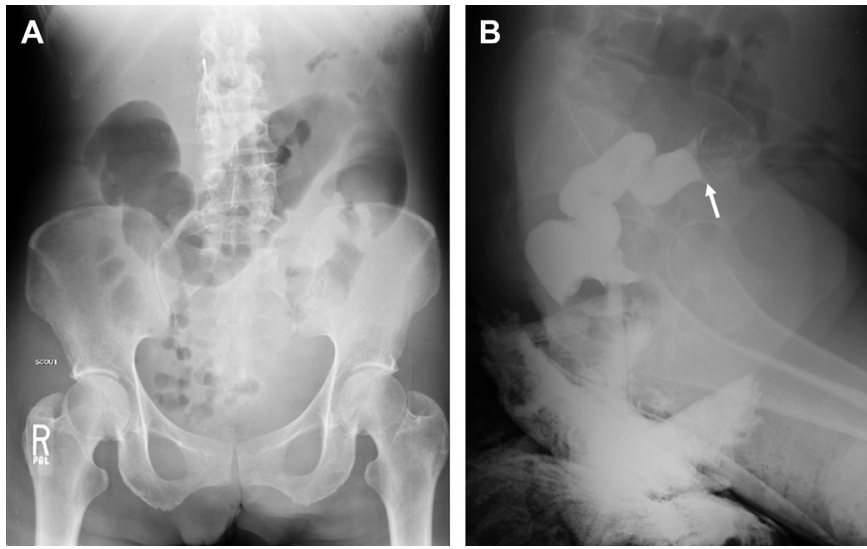

Fig. 1. Large bowel obstruction on plain film. (*A*) Proximal colon dilatation caused by sigmoid mass. (*B*) Gastrografin enema revealing obstructing sigmoid colon cancer (*arrow*).