Surgical and Ablative Modalities for the Treatment of Colorectal Cancer Metastatic to the Liver

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Colorectal cancer is the second leading cause of mortality from cancer in the United States. Death from colorectal cancer usually results from metastatic disease to the liver. Complete surgical resection is the only potentially curative treatment option for metastatic colorectal cancer to the liver, with a five-year survival rate of approximately 30%–40%. The addition of adjuvant systemic or hepatic intra-arterial pump chemotherapy appears to improve survival. Treatment options for unresectable disease in the liver are cryosurgery (intraoperative freezing of tumors), radiofrequency ablation (intraoperative or percutaneous heating of tumors), hepatic intra-arterial infusion pump chemotherapy (regional chemotherapy), and systemic chemotherapy. This article describes metastatic colorectal cancer disease presentation, extent of disease evaluation, and nonchemotherapeutic treatment options, including surgical and ablative therapies. The nurse's role in caring for this population also will be discussed.

Key Words: colorectal neoplasms; digestive system surgical procedures; catheter ablation; infusions, intra-arterial

Annually, 147,500 people are diagnosed with colorectal cancer in the United States, and at least 50,000 of these people will develop liver metastases (Blumgart & Fong, 1995; Jemal et al., 2003; Wingo, Tong, & Bolden, 1995). The liver is the most common and often the only site of metastatic disease because it is the first major organ reached by venous blood draining from the intestinal tract (Fong, 1999; Fong, Fortner, Sun, Brennan, & Blumgart, 1999; Fong & Salo, 1999). When the liver is the only site of metastatic disease and all tumors can be safely removed, resection is appropriate therapy. For metastatic colorectal cancer (MCR) to the liver that is unresectable, chemotherapy offers disease control, with median survival being 12–16 months (Fong, 2000). Untreated hepatic colorectal metastases typically result in death in approximately 5–10 months, depending on extent of disease (Bengmark & Hafstrom, 1969; Oxley & Ellis, 1969; Wood, Gillis, & Blumgart, 1976).

A preoperative scoring system for patients being considered for resection has been developed in an attempt to predict patient outcome. The clinical risk score is calculated from five criteria: node-positive disease (from primary colon tumor), disease-free interval less than 12 months, number of liver tumors greater than one, size of largest tumor greater than 5 cm, and carcinoembryonic antigen (CEA) greater than 200 ng/ml. A point is assigned for each criterion. Patients with up to two criteria are more likely to benefit following hepatic resection alone, whereas patients with a higher score should be considered for stratification for adjuvant clinical trials because their disease is more likely to recur (Fong et al., 1999).

Symptoms and Clinical Presentation

Most patients with MCR to the liver are asymptomatic. In most cases, elevated CEA and liver function tests are found on routine follow-up (Fong, Kemeny, Paty, Blumgart, & Cohen, 1996). This warrants further investigation with radiologic tests.

Clinical Evaluation

Clinical evaluation consists of diagnostic studies to determine the extent of disease; if the liver is found to be resectable, patients' medical fitness to undergo surgical or ablative treatment also is determined. Imaging studies are essential in evaluating the location of the tumor and the extent of disease. Preoperative imaging plays a crucial role in patient selection. Accurate imaging is imperative to avoid surgery for patients whose disease may not be technically amenable to hepatic resection and to assist the surgeon in planning the appropriate operation. Radiologic preoperative workups have two objectives: to (a) exclude extrahepatic disease and (b) evaluate the number and size of tumors and proximity to the major vessels. The results of theses studies are crucial in determining whether surgical resection is the appropriate course of treatment (DeMatteo & Fong, 1999; Fong, 1999, 2000; Fong & Salo, 1999; Jarnagin et al., 1999; Saini, 1997).

The test or combination of tests that are used are dependent on the plan of treatment (Rychcik, 2000). The following imaging

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