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Robot-Assisted Right Colectomy with Sequential Wedge Resection of Segments 4 and 5 of The Liver and Cholecystectomy for Colon Cancer with Metastasis to The Liver

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Abstract

The liver is the most common place for colon adenocarcinoma metastasis because of portal circulation. The surgical intervention for patients with colon adenocarcinoma with synchronous metastasis to the liver has been debated. Studies have shown that the simultaneous resection of a colorectal adenocarcinoma with a liver metastasis has similar outcomes compared to the traditional staged approach when looking at morbidity, mortality, and long-term oncologic effects. There has also been a shift to less invasive procedures when performing abdominal surgery. However, the laparoscopic method that has increasingly been used for the simultaneous procedure is technically challenging and therefore not widely adopted. The technical limitations hindering the simultaneous method could be overcome by utilizing a robotic approach. The aim of this report is to demonstrate the effectiveness of a robotic approach for colon adenocarcinoma with synchronous liver metastases.

Keywords

robotic surgery, surgical oncology, colorectal, liver, minimally invasive surgery

The method of surgery for patients with colorectal adenocarcinoma with metastasis to the liver remains a controversial topic. There are concerns for increased morbidity and mortality (M&M) related to a synchronous procedure because of the extended time under anesthesia and potential blood loss. The liver is the most common site of metastasis in patients with colorectal cancer because of portal circulation.[1] Nearly one half of patients with colorectal adenocarcinoma will develop liver metastasis during the course of their disease, with 15 to 42% presenting with synchronous primary colorectal adenocarcinoma and colorectal liver metastasis. A staged approach has been traditionally used in management of patients with synchronous liver metastasis, but there is no difference in comparable morbidity, mortality, and long-term oncologic outcomes between simultaneous and staged resections.[2] Even though studies have shown that a laparoscopic assisted combined colon and liver resection is a feasible and safe procedure, there is hesitance in adopting this method for colorectal cancer with liver metastases because of the technical challenges. The limitations of laparoscopic surgery for simultaneous colorectal and liver surgery could be overcome by adapting a robotic approach.[3] The aim of this case report is to demonstrate the use of synchronous robotic assisted surgery for colorectal adenocarcinoma with liver metastases.

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The patient is a 63-year-old African American male with a prior history of supraventricular tachycardia and colon adenocarcinoma. He initially presented with a gastrointestinal bleed and was found to have colon mass on colonoscopy which was biopsied and confirmed colon cancer. He subsequently underwent a CT scan which showed a lesion in segment 7 of the liver concerning for metastasis. After completion of neoadjuvant FOLFOX and Avastin therapy, he underwent re-staging which showed shrinkage of both colon and liver tumors: 17 mm to 6 mm and 7 cm to 3.5 cm, respectively. He subsequently underwent laparoscopic ultrasound of the liver followed by robot assisted right hemicolectomy with sequential wedge resection of segments 4 and 5 of the liver and cholecystectomy. The total time of the procedure was 323 minutes.

Colorectal cancer remains one of the most common reasons for hepatic resection in patients with metastatic disease. Up to 25% to 30% of patients with colorectal cancer will present with synchronous colorectal liver metastasis. The traditional paradigm of a staged operation for colorectal cancer with liver metastasis has been questioned because of the decrease in morbidity and mortality associated with hepatectomy over the last 20 years.[2] There has been a shift towards minimally invasive surgery as the standard treatment option in almost all gastrointestinal surgeries. Minimally invasive surgeries were associated with a greater reduction in deaths and in major complications in older adults when compared to open procedures.[1] The one stage approach avoids two or more separate operative procedures, reducing the risk for the patient, decreasing time between treatments, as well as the overall costs. Likewise, a one stage approach showed no difference in morbidity and mortality while providing positive surgical results accompanied with less pain, shorter hospital stays, fewer wound-related complications, and earlier return to work. Navarro et al have a set of guidelines for the type of surgical approach (open, laparoscopy, and robotic) based on the complexity of the liver procedure. A laparoscopic procedure was preferred if the tumor was smaller than 5 cm with no major vascular or other organ involvement, favorable tumor location (segment 2, 3, 4, 5, and 6), adequate future liver remnant volume, and a general health condition able to tolerate prolong pneumoperitoneum. However, a robotic approach was preferred for patients with bilobar tumor involvement and unfavorable segment location (segments 1, 7, and 8).[4]

Despite the advantages shown in literature for the laparoscopic synchronous approach, the complexity of these surgeries has hindered the adoption of such approaches among surgeons.[1] Robotic surgery is gaining popularity in various fields that require more complex surgical procedures because it allows dissection in confined spaces, improving the surgeon's skills. The magnified view and improved ergonomics and dexterity offered by robotic procedures facilitate the use of this minimally invasive procedure. Bleeding complications with robotic surgery are reported to be less when compared to laparoscopic and open procedures.[4] A robotic procedure was the optimal method for our patient because of his age and the magnitude of tumor formation. Older patients benefit from the use of minimally invasive procedures, as smaller cuts decrease the occurrence of major complications and allow for faster recovery.

Declaration of Conflicting Interests

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