VIDEO ARTICLE
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Step-by-step single-port retroperitoneal right hemicolectomy with D3-lymph node dissection for right colon cancer

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ABSTRACT

Minimally invasive right hemicolectomy for colon cancer has demonstrated better outcomes than those of open surgery. However, in certain patients, high body mass index, abdominal adhesions, and concomitant cardiopulmonary disease may limit the use of conventional laparoscopy. The use of the retroperitoneal approach preserves the benefits of the minimally invasive approach and expands the range of surgical options. All major steps were performed without access to the abdominal cavity: mobilization, D3 lymph node dissection and vessels ligation. Supplementary video demonstrates a retroperitoneal approach for right hemicolectomy with D3 lymph node dissection that can solve these challenges.

Keywords: Cancer, colon, colorectal cancer, laparoscopic surgery, minimal invasive surgery, retroperitoneal approach

INTRODUCTION

Minimally invasive right hemicolectomy for colon cancer has demonstrated better outcomes than those of open surgery (1). However, in certain patients, high body mass index, abdominal adhesions, and concomitant cardiopulmonary disease may limit the use of conventional laparoscopy (2-4). All main steps were performed without access to the abdominal cavity: mobilization, D3 lymph node dissection and vessels ligation. Video 1 demonstrates a retroperitoneal approach for right hemicolectomy with D3 lymph node dissection that can solve these challenges.

A 65-year-old patient was diagnosed with adenocarcinoma of the ascending colon (cT3N1M0). The retroperitoneal approach was chosen because of a high body mass index of 32.8 kg/m^2. The first trocar was placed paraumbilically for abdominal exploration. After reviewing the abdominal cavity, the pneumoperitoneum was eliminated. An incision for the single-port system was made in the right flank, midway between the right costal arch and iliac spine. A single port was placed in the retroperitoneal space under optical guidance. The retroperitoneal step began with a lateral-to-medial dissection in the interfascial plane between Toldt's and Gerota's fasciae, using the right gonadal vessels and ureter (located posteriorly within this plane) as landmarks. The dissection continued towards the duodenum, and the mesocolic fascia was separated from the anterior pancreatic surface. The trunk of Henle was carefully dissected from the cranial portion of this region. The superior mesenteric vessels were accessed by incising the parietal fascia of the mesocolon.

The next step involved dissecting the intestinal branches of Henle's trunk. The origin of the middle colic vein and right gastroepiploic vein were clipped and cut. After identification, the right gastroepiploic artery was clipped and transected. The final step of the lymph node dissection involved incising the middle colic artery, with fatty tissue containing groups 203 and 223 lymph nodes (per the Japanese Society for Cancer of the Colon and Rectum). Interfascial dissection was performed to completely mobilize the right mesocolon. D3 lymph node dissection was performed.

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The peritoneum was incised in the right lateral canal to connect the retroperitoneal space with the abdominal cavity.

An additional 5 mm trocar was inserted for laparoscopy. Transabdominally, the right lateral canal was dissected cranially and caudally. Subsequently, the mesocolon was transected over the superior mesenteric vessels, starting at a defined location and proceeding towards the distal and proximal resection borders. The hepatocolic ligament was divided to mobilize the hepatic flexure. The bowel was removed from the abdominal cavity through the single-port. The hand-sewn anastomosis was performed extracorporeally. The blood loss was 10 mL, and the operative time was 300 min, with the retroperitoneal dissection lasting 170 min. A total of 34 lymph nodes were harvested, with one tumor deposit identified in the specimen. Histopathological examination confirmed an R0 resection, with all margins free of neoplastic involvement. The patient's recovery was uneventful. Bowel function resumed on day 4, and the length of hospital stay was 9 days. There were no readmissions or reoperations within 30 days.

This technique demonstrates the feasibility of using the retroperitoneal approach for right hemicolectomy. In selected patients, this approach may offer various advantages to the surgeons.

Video Link: https://youtu.be/TBbYY60083E

Ethics

Informed Consent: The authors are accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The patient provided concent for publication of this report and any accompanying images.

Footnotes

Author Contributions

Concept - S.K.E.; Design - S.K.E.; Data Collection or Processing - P.D.P., Y.C.; Analysis or Interpretation - S.K.E., Y.P.K.; Literature Search - P.D.P, A.Y.K.; Writing - S.K.E., P.D.P., Y.P.K., A.Y.K., Y.C.

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