



# Cranial-first approach for laparoscopic extended right hemicolectomy

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Complete mesocolic excision and central vascular ligation with D3 lymphadenectomy are important surgical principles for improving oncological outcomes in colon cancer. The cranial-first approach is a colonic mobilization–first approach for radical right hemicolectomy, which has several advantages, including early feasibility assessment, safe dissection from surrounding organs, preestablished inferior margin of lymph node dissection, and revelation of the tangible anatomy of the tributaries of the gastrocolic trunk. This video demonstrates the cranial-first approach for laparoscopic extended right hemicolectomy in a 66-year-old man with locally advanced cecal cancer.

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Compared to conventional resection, complete mesocolic excision (CME) and central vascular ligation (CVL) with D3 lymphadenectomy are important surgical principles for colon cancer to improve oncologic outcomes [1–5]. CME requires anatomical dissection along the embryological planes to avoid disruption of the mesocolon within the peritoneal envelope [1–3, 5]. CVL with D3 lymphadenectomy requires high ligation of the feeding vessels and removal of lympho-adipose tissue along the superior mesenteric vein (SMV) and head of the pancreas [2, 6, 7]. These procedures are technically challenging and carry the risk of major vascular injury owing to the complex anatomy of the right colon and the wide variation in the vasculature, especially when performed laparoscopically [2, 4, 6, 7]. Various surgical approaches have been proposed to address this problem. However, standardization of this procedure has not yet been achieved [1, 4]. Of the several techniques, this video presented the “cranial-first approach” to radical right hemicolectomy.

In radical right hemicolectomy, operative methods can be classified into 2 large categories: colonic mobilization–first and vessel ligation–first approaches [1, 3–6, 8]. Compared with the vessel ligation–first methods, such as the medial approach, the cranial-first approach starts with the mobilization of the colon and mesocolon before vascular ligation. Beginning with mobilization first has several merits. First, resectability assessment is feasible in the early phase of surgery, and safe dissection from the surrounding organs can be easily performed by partitioning the gauze between the adjacent organs and the mesenteric envelope. Furthermore, the inferior margin of lymph node dissection can be preestablished, reducing unnecessary or hazardous dissection in the confined spaces around the major mesenteric vessels. Another important strength of this superior approach is that it can reveal the tangible anatomy of the tributaries of the gastrocolic trunk, which is not clearly visible using the medial approach.

Considering these factors, the surgeon in the video chose to

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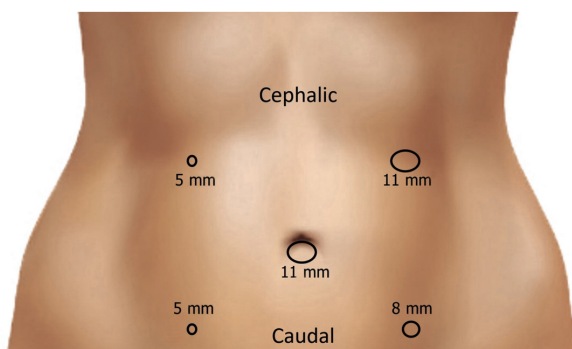
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adopt this approach (Supplementary Video 1). The video shows a 66-year-old man who underwent extended laparoscopic right hemicolectomy for locally advanced cecal cancer (Fig. 1). The patient was placed in the supine position. Five trocar ports were used: an 11-mm port in the infraumbilical area for the camera, 11- and 8-mm working ports in the left upper and lower quadrants, respectively, and 5-mm ports each in the right upper and lower quadrants for assistance (Fig. 2). Dissection was initiated via a cranial approach inside the gastrocolic ligament. The fused fascia and the transverse mesocolon were dissected to reach the hepatic flexural plane. Mobilization of the hepatic flexure and dissection near the middle colic vessels followed, exposing the sec-



**Fig. 1.** Computed tomography image showing the advanced cecal cancer in near-obstructing status (circle) and the enlarged lymph nodes in the ileal mesentery (arrow).



**Fig. 2.** Trocar placements for laparoscopic right hemicolectomy.

ond portion of the duodenum, head of the pancreas, and proximal portion of the SMV. Before proceeding to the inferior approach, a sterile gauze was placed on the transverse colon to separate the mesocolon from the duodenum, pancreas, and greater omentum to ensure safe medial dissection. In the inferior approach, the posterior space of the right colon was dissected between the retroperitoneum and Toldt fascia, from the cecum to the hepatic flexure. The dissection continued to the plane between the ascending mesocolon and the visceral peritoneum of the pancreas and duodenum, called the Fredet fascia, to fully uncover the second portion of the duodenum and the head of the pancreas.

Finally, the procedure was switched to a medial approach along the right side of the SMV. To ensure a sufficient margin of the mesentery, radical mesenteric lymph node dissection was performed, starting from the distal part of the SMV, without dissection of the trunk of the ileocolic vein. The roots of the ileocolic artery and vein were identified, clipped, and cut. As lymph node metastases in the ileal mesentery were suspected, extended lymph node dissection was performed along the SMV, and the branch of ileal artery was ligated and cut.

Dissection was continued along the surgical trunk of Gillot, which is the lympho-adipose tissue covering the SMV between the ileocolic vein and the gastrocolic trunk of Henle [7]. The root of the right colic vein was identified, ligated, and cut. The right colic artery, which runs next to the right colic vein, was ligated and excised. Further dissection was continued upward from the right colic vein to locate the middle colic artery and vein, which were clipped and cut. There was a rare variation in the vascular anatomy. The inferior mesenteric vein drained directly into the SMV. After ligation of the major vessels was completed, extracorporeal ileocolic anastomosis was performed by upper midline minilaparotomy, and the operation was completed.

The final pathological examination revealed a poorly differentiated adenocarcinoma with T4aN2bM0, including lymphatic, vascular, and perineural invasions. The operation time was 120 minutes. The patient recovered without any postoperative complications and was discharged on postoperative day 6.

This video demonstrates that the cranial-first approach is a feasible and safe way to perform radical right hemicolectomy. Good quality oncological resection can be achieved using this technique, including CME and CVL with D3 lymphadenectomy.

### Ethics statement

The study was approved by the Institutional Review Board of Seoul National University Bundang Hospital, with a waiver for informed consent (No. B-2311-867-701).

## ARTICLE INFORMATION

### Conflict of interest

No potential conflict of interest relevant to this article was reported.

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### Additional information

The video clip was presented at the International Colorectal Research Summit (iCRS) 2023 on September 1–3, 2023, in Seoul, Korea.

### Supplementary materials

**Supplementary Video 1.** Extended right hemicolectomy: cranial-first approach.

Supplementary materials are available from <https://doi.org/10.3393/ac.2023.00661.0094>.

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