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Title: Caudal-to-Cranial Approach in Laparoscopic Right Hemicolectomy with Complete Mesocolon Excision and D3 Lymph Node Dissection

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Author Questionnaire

1. We have marked your project as author-provided footage, meaning you film the video yourself and provide JoVE with the footage to edit. JoVE will not send the videographer. Please confirm that this is correct.

☐ Correct

2. Interview statements: Which interview statement filming option is the most appropriate for your group? **Please select one.**

☒ Interviewees self-record interview statements. JoVE can provide support for this option.

3. Proposed interview filming date: Please indicate the proposed date that your group will self-film interviews: 31/01/2026

When you are ready to submit your video files, please contact our China Location Producer, [Yuan Yue](#).

Current Protocol Length

Number of Steps: 14

Number of Shots: 34

Introduction

INTRODUCTION:

~~What is the scope of your research? What questions are you trying to answer?~~

- 1.1. **Fei Gao:** My research explores minimally invasive surgery for colorectal tumors, focusing on laparoscopic right hemicolectomy using a caudal-to-cranial approach.
 - 1.1.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

CONCLUSION:

~~What advantage does your protocol offer compared to other techniques?~~

- 1.2. **Fei Gao:** My protocol explores the caudal approach, which prioritizes the utilization layer and may help reduce the difficulty of the surgery, improving surgical safety.
 - 1.2.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

~~What questions will future research focus on?~~

- 1.3. **Fei Gao:** Future research will evaluate the long-term prognostic impact of the caudal approach through extended follow-up studies.
 - 1.3.1. INTERVIEW: Named talent says the statement above in an interview-style shot, looking slightly off-camera.

Ethics Title Card

This research has been approved by the Medical Ethics Committee of the Second Affiliated Hospital of Zhengzhou University. All patients provided written informed consent form

Protocol

NOTE: Protocol Scripted from Footage

2. Caudal Approach Plane Dissection and Central Vascular Ligation in Laparoscopic Right Hemicolectomy

Demonstrator: Fei Gao

Video Editor: For shots with multiple media (Figure and media file), please play both side by side in a split screen

2.1. To begin, dissect and develop the right retro-colic space and the pre-pancreatoduodenal space using a caudal approach [1]. Apply traction to the ileocecal region and the root of the small bowel mesentery, reflecting them cranially to expose the membranous bridge between the right mesocolon and the retroperitoneum [2].

2.1.1. LAB MEDIA: 69484-1.MP4 10:36 – 10:43; 11:14 – 11:27
AND **Figure 3A**

2.1.2. LAB MEDIA: 69484-1.MP4 11:52 – 11:57
AND
69484-2.MP4 00:39 – 00:50

2.2. Incise the membranous bridge along the avascular line of Toldt approximately 1 centimeter above the right common iliac artery to enter the right retro-colic space [1]. Expand the space cranially until the horizontal part of the duodenum is visible medially [2].

2.2.1. LAB MEDIA: 69484-2.MP4 00:58 – 01:07

2.2.2. LAB MEDIA: 69484-2.MP4 02:19– 02:27
AND **Figure 3B**

2.3. Use the vessels on the medial side of the duodenum as landmarks [1]. Perform a deliberate crawling up maneuver to identify the pancreas [2]. Dissect the pre-pancreatoduodenal space to expose the pancreas [3]. Perform medial dissection to reveal the superior mesenteric vein [4].

2.3.1. LAB MEDIA: 69484-2.MP4 04:20 – 04:40
AND **Figure 3C**

2.3.2. LAB MEDIA: 69484-2.MP4 04:40-04:50

2.3.3. LAB MEDIA: 69484-2.MP4 12:47 – 13:00

2.3.4. LAB MEDIA: 69484-3.MP4 00:58-01:15
AND **Figure 3D**

2.4. Incise Toldt's fusion fascia lateral to the duodenum to connect the right retro-colic

space and the pre-pancreatoduodenal space [1]. Dissect cranially near the colonic hepatic flexure [2]. Incise the parietal peritoneum of the right colon to complete the plane dissection for the caudal approach [3].

2.4.1. LAB MEDIA: 69484-3.MP4 02:38 – 02:45;
AND **Figure 3E**

2.4.2. LAB MEDIA: 69484-3.MP4 04:18 – 04:25

2.4.3. LAB MEDIA: 69484-3.MP4 10:07 – 10:18
AND **Figure 3F,G**

2.5. Have the assistant's left forceps pull the middle colic vessels cranially and the right forceps lift the ileocolic vascular pedicle [1].

2.5.1. LAB MEDIA: 69484-4.MP4 00:40-00:55

2.6. Incise the mesentery at the oblique fold below the ileocolic vascular pedicle, connecting with the previously dissected right retro-colic space [1]. Continue incising medially to expose the superior mesenteric vein [2].

2.6.1. LAB MEDIA: 69484-4.MP4 02:24 – 02:40

AND LAB MEDIA: 69484-4.MP4 03:22 – 03:33, 04:24 – 04:38
and **Figure 4A**

2.6.2. LAB MEDIA: 69484-4.MP4 05:10 – 05:30
AND **Figure 4B**

2.7. Use the line from the root of the ileocolic vein to the medial edge of the middle colic artery as the cutting line and incise the right mesocolon [1]. Open the superior mesenteric vein vascular sheath and dissect within the sheath to expose the ileocolic vein and artery, right colic artery, and middle colic artery [2].

2.7.1. LAB MEDIA: 69484-4.MP4 06:30 – 06:40, 07:55 – 08:08

2.7.2. LAB MEDIA: 69484-4.MP4 08:59 – 09:05; 10:36 – 10:46; 12:42 – 12:47
AND **Figure 4C**

2.8. Perform mesenteric resection and D3 lymph node dissection along the medial border of the superior mesenteric vein [1]. Ligature the vessels stepwise using disposable ligation clips [2].

2.8.1. LAB MEDIA: 69484-5.MP4 11:38 – 11:48

2.8.2. LAB MEDIA: 69484-5.MP4 13:09 – 13:11
AND

LAB MEDIA: 69484-6.MP4 00:05 – 00:12; 00:21 – 00:28

2.9. Dissect Henle's trunk and its branches [1]. Clearly expose the trunk before ligating the

right colic vein to avoid injury to adjacent veins [2]. Complete all medial approach steps [3].

- 2.9.1. LAB MEDIA: 69484-7.MP4 06:55 – 07:17
- 2.9.2. LAB MEDIA: 69484-7.MP4 09:27 – 09:46
AND Figure 4E,F
- 2.9.3. LAB MEDIA: 69484-7.MP4 10:27 – 10:38, 11:08 – 11:13

2.10. Transition to the cranial approach by opening the gastrocolic ligament outside the gastroepiploic vascular arch [1]. Separate the transverse colonic mesentery from the mesogastrium to connect with the medial dissection plane [2]. Dissect rightwards toward the hepatic flexure to complete excision of the right mesocolon [3].

- 2.10.1. LAB MEDIA: 69484-8.MP4 00:37 – 00:45, 04:28 – 04:45
AND
Figure 5A
- 2.10.2. LAB MEDIA: 69484-8.MP4 12:25 – 12:29,
69484-9.MP4 03:21 – 03:26,
69484-10.MP4 01:33 – 01:37
AND Figure 5B
- 2.10.3. LAB MEDIA: 69484-9.MP4 03:59 – 04:07, 05:04 – 05:10

2.11. Trim the mesocolon and ileal mesentery along the planned transection lines [1]. Perform transection using a 60-millimeter endoscopic linear stapler [2].

- 2.11.1. LAB MEDIA: 69484-10.MP4 06:41 – 06:49,
- 2.11.2. LAB MEDIA: 69484-10.MP4 01:33 – 01:37, 12:20 – 12:30

2.12. To perform intracorporeal digestive tract reconstruction, place the specimen in an endoscopic retrieval bag [1]. Create an opening in the taenia coli 6 centimeters from the transverse colon stump and another opening 2 centimeters from the ileal stump [2].

- 2.12.1. LAB MEDIA: 69484-11.MP4 03:23 – 03:42, 05:46 – 05:56
- 2.12.2. LAB MEDIA: 69484-12.MP4 11:08 – 11:13, 11:28-11:37, 12:28 – 12:31,
12:37 – 12:48

2.13. Perform a side-to-side isoperistaltic anastomosis using a 60 millimeter endoscopic linear stapler [1]. Close the common opening with continuous 3-0 barbed suturing followed by seromuscular imbrication [2]. Then extend the infra-umbilical observation port incision 3 to 5 centimeters for specimen extraction [3].

- 2.13.1. LAB MEDIA: 69484-13.MP4 02:48-02:51, 03:36 – 03:42, 04:15 – 04:22
AND

Figure 6A

2.13.2. LAB MEDIA: 69484-13.MP4 07:27 – 07:35, 10:59 – 11:08, 11:49 – 11:59

2.13.3. LAB MEDIA: 69484-15.MP4 09:33 – 09:37; 09:54 – 09:56

AND

Figure 6B

2.14. Irrigate the abdominal cavity with 500 to 1000 milliliters of normal saline [1]. Place one drain near the anastomosis and another in the pelvis [2].

2.14.1. LAB MEDIA: 69484-15.MP4 02:55-03:20

2.14.2. LAB MEDIA: 69484-15.MP4 05:00 – 05:13

Results

3. Results

- 3.1. The mean patient age was 64.42 years[1], and the mean body mass index was 22.80 kilograms per square meter [2].
 - 3.1.1. LAB MEDIA: Table 1. *Video editor: Highlight the row labeled “Age (years), mean (SD)”.*
 - 3.1.2. LAB MEDIA: Table 1. *Video editor: Highlight the row labeled “BMI (kg/m²), mean (SD)”.*
- 3.2. Seven patients had a history of abdominal surgery [1], and 1 patient presented with preoperative intestinal obstruction [2].
 - 3.2.1. LAB MEDIA: Table 1. *Video editor: Highlight the row labeled “Prior abdominal surgery”.*
 - 3.2.2. LAB MEDIA: Table 1. *Video editor: Highlight the row labeled “Obstruction”.*
- 3.3. The mean operative time was 181.25 minutes [1], and the mean estimated blood loss was 76.67 milliliters [2]. Totally intracorporeal anastomosis was performed in 6 cases [3].
 - 3.3.1. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Operation time (min), mean (SD)”.*
 - 3.3.2. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Estimated blood loss (ml), mean (SD)”.*
 - 3.3.3. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Intracorporeal Anastomosis”.*
- 3.4. The mean time to first flatus was 3.39 days [1], to initiating a liquid diet was 4.57 days [2], and the mean postoperative hospital stay was 10.36 days [3].
 - 3.4.1. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Time to first gas passing (d), mean (SD)”.*
 - 3.4.2. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Time to first fluid diet (d), mean (SD)”.*
 - 3.4.3. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Postoperative hospitalization (d), mean (SD)”.*
- 3.5. According to the American Joint Committee on Cancer staging system, 9 patients were stage I, 11 patients were stage II, and 13 patients were stage III [1]. Three patients received neoadjuvant therapy [2].

- 3.5.1. LAB MEDIA: Table 1. *Video editor: Highlight the rows labeled “AJCC stage I”, “AJCC stage II”, and “AJCC stage III”.*
- 3.5.2. LAB MEDIA: Table 1. *Video editor: Highlight the row labeled “Neoadjuvant therapy”.*
- 3.6. The mean number of harvested lymph nodes was 26.85 [1] and the mean number of positive lymph nodes was 1.30 [2].
 - 3.6.1. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Number of harvested LNs, mean (SD)”.*
 - 3.6.2. LAB MEDIA: Table 2. *Video editor: Highlight the row labeled “Number of positive LNs median (IQR)”.*
- 3.7. The overall postoperative complication rate was 12.12% [1]. Postoperative complications included wound infection in 2 patients, chylous fistula in 1 patient, and anastomotic leakage in 1 patient [2].
 - 3.7.1. LAB MEDIA: Table 3. *Video editor: Highlight the row labeled “Overall postoperative complications”.*
 - 3.7.2. LAB MEDIA: Table 3. *Video editor: Highlight the rows labeled “Wound infection”, “Chylous fistula” and “Anastomotic leakage”.*

Pronunciation Guide:

Caudal-to-cranial

Pronunciation link: <https://www.merriam-webster.com/dictionary/caudal>

IPA: /'kɔːdəl/

Phonetic Spelling: kaw·duhl

Laparoscopic

Pronunciation link: <https://www.merriam-webster.com/dictionary/laparoscopic>

IPA: /ˌləpəˈrɑːskəˌpɪk/

Phonetic Spelling: lap·uh·raas·kaa·pik

Hemicolectomy

Pronunciation link: <https://www.merriam-webster.com/dictionary/hemicolectomy>

IPA: /ˌhɛmɪkəˈlɛktəmi/

Phonetic Spelling: heh·mi·kuh·lek·tuh·mee

Mesocolon

Pronunciation link: <https://www.merriam-webster.com/dictionary/mesocolon>

IPA: /ˌmɛzəʊˈkɒləːn/

Phonetic Spelling: meh·zoh·koh·laan

Excision

Pronunciation link: <https://www.merriam-webster.com/dictionary/excision>

IPA: /ɪkˈsɪʒən/

Phonetic Spelling: ik·si·zhuhn

Lymphadenectomy

Pronunciation link: <https://www.merriam-webster.com/dictionary/lymphadenectomy>

IPA: /ˌlɪmfˌædɪˈnɛktəmi/

Phonetic Spelling: limf·a·duh·nek·tuh·mee

Retroperitoneum

Pronunciation link: <https://www.merriam-webster.com/dictionary/retroperitoneal>

IPA: /ˌrɛtroʊˌpɛrɪtəˈniːəl/

Phonetic Spelling: reh·troh·peh·ruh·tuh·nee·uhl

Ileocecal

Pronunciation link: <https://www.merriam-webster.com/dictionary/ileocecal>

IPA: /ˌɪləʊˈsi:kəl/

Phonetic Spelling: il·ee·oh·see·kuhl

Mesentery

Pronunciation link: <https://www.merriam-webster.com/dictionary/mesentery>

IPA: /ˈmezənˌtəri/

Phonetic Spelling: meh·zuhn·teh·ree

Duodenum

Pronunciation link: <https://www.merriam-webster.com/dictionary/duodenum>

IPA: /ˌduːəˈdiːnəm/, /ˌdjuːəˈdiːnəm/

Phonetic Spelling: doo·uh·dee·nuhm; dyoo·uh·dee·nuhm

Pancreas

Pronunciation link: <https://www.merriam-webster.com/dictionary/pancreas>

IPA: /ˈpæŋkriəs/

Phonetic Spelling: pang·kree·uhs

Superior mesenteric vein

Pronunciation link: <https://www.merriam-webster.com/dictionary/mesenteric>

IPA: /məˈzɛnˌtɛrɪk/

Phonetic Spelling: muh·zen·teh·rik

Toldt's fascia

Pronunciation link: <https://www.merriam-webster.com/dictionary/fascia>

IPA: /ˈfæʃə/

Phonetic Spelling: fa·shuh

Hepatic flexure

Pronunciation link: <https://www.merriam-webster.com/dictionary/hepatic>

IPA: /hɪˈpætɪk/

Phonetic Spelling: huh·pa·tik

Ileocolic

Pronunciation link: <https://www.merriam-webster.com/dictionary/ileocolic>

IPA: /ˌɪləʊˈkɑːlɪk/

Phonetic Spelling: il·ee·oh·kaa·lik

Anastomosis

Pronunciation link: <https://www.merriam-webster.com/dictionary/anastomosis>

IPA: /əˌnæstəˈmoʊsɪs/

Phonetic Spelling: uh·nas·tuh·moh·suhs

Isoperistaltic

Pronunciation link: <https://www.merriam-webster.com/dictionary/isoperistaltic>

IPA: /ˌaɪsoʊˌpɛrɪˈstɔːltɪk/

Phonetic Spelling: eye·soh·peh·ruh·stawl·tik

Intracorporeal

Pronunciation link: <https://www.merriam-webster.com/dictionary/intracorporeal>

IPA: /ˌɪntrəˈkɔːrɪəl/

Phonetic Spelling: in·truh·kor·por·ee·uhl

Gastrocolic

Pronunciation link: <https://www.merriam-webster.com/dictionary/gastrocolic>

IPA: /ˌgæstrəʊˈkɔːlɪk/

Phonetic Spelling: gas·troh·kaa·lik

Gastroepiploic

Pronunciation link: <https://www.merriam-webster.com/dictionary/gastroepiploic>

IPA: /ˌgæstrəʊˌɛpɪˈplɔɪk/

Phonetic Spelling: gas·troh·eh·puh·ploh·ik

Taenia coli

Pronunciation link: <https://www.merriam-webster.com/dictionary/taenia>

IPA: /ˈtiːniə/

Phonetic Spelling: tee·nee·uh

Seromuscular

Pronunciation link: <https://www.merriam-webster.com/dictionary/seromuscular>

IPA: /ˌsɪroʊˈmʌskjələr/

Phonetic Spelling: seer·oh·mus·kyuh·ler

Infra-umbilical

Pronunciation link: <https://www.merriam-webster.com/dictionary/infraumbilical>

IPA: /ˌɪnfrəˈʌmˌbɪlɪkəl/

Phonetic Spelling: in·fruh·um·bil·i·kuhl

Chylous

Pronunciation link: <https://www.merriam-webster.com/dictionary/chylous>

IPA: /'kæləs/

Phonetic Spelling: kye·luhs

Neoadjuvant

Pronunciation link: <https://www.merriam-webster.com/dictionary/neoadjuvant>

IPA: /,ni:ʊʊ'ædzəvənt/

Phonetic Spelling: nee·oh·a·juh·vuhnt