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Title: Treatment of Middle-Segment Pancreatic Benign Tumor Using Laparoscopic Central Pancreatectomy with End-to-end Pancreatic Duct Reconstruction

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Author Questionnaire

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2. Microscopy: Does your protocol require the use of a dissecting or stereomicroscope for performing a complex dissection, microinjection technique, or something similar? **No**

3. Software: Does the part of your protocol being filmed include step-by-step descriptions of software usage? **No**

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Current Protocol Length

Number of Steps: 15

Number of Shots: 35

Introduction

NOTEL: Authors want to skip the Introduction section

Ethics Title Card

This research has been approved by the Ethics Committee at Qingyuan People's Hospital,
Guangzhou Medical University

Protocol

1. Mid-Pancreatic Segment Resection and Reconstruction with Intraoperative Assessment for Benign Cystic Lesion

Demonstrator: [Click here to enter name of demonstrator\(s\)](#)

NOTE: Scripted from provided footage

1.1. To begin, explore abdominal organs to assess the intra-abdominal condition and to ensure no obvious ascites was present [1]. Observe a distended gallbladder with no significant wall thickening [2-TXT].

1.1.1. LAB MEDIA: 69368-1.mp4 02:30 – 02:40

1.1.2. LAB MEDIA: 69368-1.mp4 02:40 – 02:53

TXT: Confirm absence of enlarged lymph nodes and normal GI tract

1.2. Open the gastrocolic ligament using an ultrasonic dissector [1]. Divide the left half of the ligament segmentally up to the avascular plane [2] and continue the dissection to the right as far as the pancreatic head [3].

1.2.1. LAB MEDIA: 69368-1.mp4 03:40 – 03:49, 07:36 – 12:23

1.2.2. LAB MEDIA: 69368-1.mp4 05:50–06:10

1.2.3. LAB MEDIA: 69368-1.mp4 12:15 – 12:23

1.3. Fully expose the non-edematous and soft pancreas [1]. Then identify a mass located at the pancreatic neck and body [2]. Observe multiple 0.3-centimeter by 0.3 centimeter cysts, to the right of the mass [3] and a larger single cyst superior and to the left [4].

1.3.1. LAB MEDIA: 69368-1.mp4 18:20– 18:26

1.3.2. LAB MEDIA: 69368-1.mp4 18:26 – 18:33

1.3.3. LAB MEDIA: 69368-1.mp4 18:34 – 18:50

1.3.4. LAB MEDIA: 69368-1.mp4 18:52– 18:53

TXT: Note that all cysts are soft and well-circumscribed

Video Editor: Please freeze frame here

1.4. To perform the mid-segment pancreatic resection, first open the lesser omentum [1]. Retract the stomach and liver to fully expose the pancreas [2]. Mobilize the inferior border of the mid-pancreas [3].

1.4.1. LAB MEDIA: 69368-1.mp4 28:09– 28:20

- 1.4.2. LAB MEDIA: 69368-1.mp4 27:00-27:19
- 1.4.3. LAB MEDIA: 69368-1.mp4 34:25 – 34:45
- 1.5. Identify the superior mesenteric vein and the root of the splenic vein [1]. Proceed with dissection leftward along the posterior-inferior aspect of the pancreas toward the left margin of the lesion [2].
 - 1.5.1. LAB MEDIA: 69368-1.mp4 45:30– 45:47
 - 1.5.2. LAB MEDIA: 69368-1.mp4 53:20 – 53:42
- 1.6. Then dissect the superior border to expose the common hepatic artery [1]. Transect the pancreatic neck just to the right of the mass using the ultrasonic dissector [2].
 - 1.6.1. LAB MEDIA: 69368-1.mp4 01:01:27– 01:01:51,
 - 1.6.2. LAB MEDIA: 69368-1.mp4 01:04:38– 01:04:50,
- 1.7. Sharply divide the pancreatic duct, with scissors, noting the clear pancreatic fluid [1]. Complete the transection of the remaining pancreatic tissue [2] and achieve hemostasis by coagulating the cut surface [3].
 - 1.7.1. LAB MEDIA: 69368-1.mp4 01:14:17– 01:14:48,
 - 1.7.2. LAB MEDIA: 69368-1.mp4 01:16:06– 01:16:35
 - 1.7.3. LAB MEDIA: 69368-1.mp4 01:23:25– 01:23:39.
- 1.8. Now free the superior pancreatic vessels [1]. Isolate the splenic artery and carefully dissect the posterior aspect of the pancreatic body and the superior border along the splenic artery and vein [2]. Clip and divide all vessels entering the pancreas then continue the dissection to the left margin of the lesion [3].
 - 1.8.1. LAB MEDIA: 69368-1.mp4 01:25:20– 01:25:31
 - 1.8.2. LAB MEDIA: 69368-1.mp4 01:27:20– 01:27:56, **Figure 8**
 - 1.8.3. LAB MEDIA: 69368-1.mp4 01:30:26– 01:30:41.
- 1.9. Transect the pancreas to the left of the mass using the ultrasonic dissector [1]. Sharply divide the pancreatic duct, again observing clear pancreatic fluid [2]. Then divide the remaining pancreatic tissue and coagulate the cut surface for final hemostasis [3].
 - 1.9.1. LAB MEDIA: 69368-1.mp4 01:32:11– 01:32:30,
 - 1.9.2. LAB MEDIA: 69368-1.mp4 01:35:41– 01:36:00,
 - 1.9.3. LAB MEDIA: 69368-1.mp4 01:43:12– 01:43:45
- 1.10. Place the resected mid-segment of the pancreas into a specimen retrieval bag and retrieve [1-TXT]. Extend the umbilical incision approximately 3 centimeters toward the umbilicus to deliver the specimen [2-TXT].

1.10.1. LAB MEDIA: 69368-1.mp4 01:50:32– 01:50:50.

TXT: Send specimen for immediate frozen-section analysis

1.11. Upon receiving the pathology report stating “Pancreatic lesion, favor benign tumor,” proceed with the planned LCP and end-to-end pancreatic duct reconstruction [1].

1.11.1. LAB MEDIA: Figure 10

2. End-to-end pancreatic duct reconstruction

2.1. Approximate the superior pancreatic margins with 3-0 Prolene figure-of-eight sutures [1]. Trim a 24-gauge scalp-needle sheath to an 11-centimeter stent and insert it into the pancreatic duct [2]. Secure the duct at the 6, 9, 12, and 3 o'clock positions using 4-0 Prolene figure-of-eight stitches [3].

2.1.1. LAB MEDIA: 69368-2.mp4 47:58–48:30

2.1.2. LAB MEDIA: 69368-2.mp4 40:26– 41:00

2.1.3. LAB MEDIA: 69368-2.mp4 49:28– 49:50

2.2. Place three additional 3-0 Prolene figure-of-eight sutures to complete the end-to-end pancreatic anastomosis [1].

2.2.1. LAB MEDIA: 69368-2.mp4 01:32:25– 01:32:49

2.3. Then flush the peritoneal cavity with normal saline and aspirate until dry [1-TXT].

2.3.1. LAB MEDIA: 69368-2.mp4 01:38:33 – 01:38:50

TXT: Confirm the absence of active bleeding or pancreatic leakage

2.4. Introduce a 24-French silicone drain through the left abdominal wall and position it above the pancreas [1]. Place another identical drain through the right port, positioning it below the pancreatic remnant before closing incisions [2].

2.4.1. LAB MEDIA: 69368-2.mp4 01:46:53 – 01:47:07

2.4.2. LAB MEDIA: 69368-2.mp4 01:47:28 – 01:47:35

Results

3. Results

3.1. The final pathological diagnosis was confirmed as a microcystic variant of serous cystadenoma [1].

3.1.1. LAB MEDIA: Figure 14. *Video editor: Please sequentially show the left image and then the right*

3.2. The postoperative computed tomography scan demonstrated uniform pancreatic parenchymal density without surrounding exudative changes and confirmed satisfactory positioning of the pancreatic duct stent [1].

3.2.1. LAB MEDIA: Figure 15. *Video editor: Highlight area inside the red box*

Pronunciation Guide:

Pancreatectomy

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

IPA: /ˌpæŋkriəˈtɛktəmi/

Phonetic Spelling: pan·kree·uh·tek·tuh·mee

Laparoscopic

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

IPA: /ˌləpərəˈskɑːpɪk/

Phonetic Spelling: la·puh·ruh·skaah·pik

Pancreatic

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

IPA: /ˌpæŋkriˈætɪk/

Phonetic Spelling: pan·kree·a·tik

Anastomosis

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

IPA: /əˌnæstəˈmoʊsɪs/

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

Gastrocolic

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

IPA: /ˌgæstrouˈkɑːlɪk/

Phonetic Spelling: gas·troh·kaa·lik

Ultrasonic

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

IPA: /ˌʌltrəˈsɑːnɪk/

Phonetic Spelling: ul·truh·saa·nik

Avascular

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

IPA: /eɪˈvæskjələr/

Phonetic Spelling: ay·vas·kyuh·ler

Edematous

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

IPA: /ɪˈdiːmətəs/

Phonetic Spelling: ih-dee-muh-tuhs

Mesenteric

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

IPA: /ˌmezənˈtɛrɪk/

Phonetic Spelling: mez-uh-nter-ik

Hemostasis

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

IPA: /ˌhiːməˈsteɪsɪs/

Phonetic Spelling: hee-muh-stay-suhs

Peritoneal

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

IPA: /ˌpɛrɪtəˈniːəl/

Phonetic Spelling: peh-rih-tuh-nee-uhl

Microcystic

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

IPA: /ˌmaɪkroʊˈsɪstɪk/

Phonetic Spelling: my-kroh-sis-tik

Cystadenoma

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

IPA: /ˌsɪstəˈdiːˈnoʊmə/

Phonetic Spelling: sis-tuh-dee-noh-muh

Computed Tomography

Pronunciation link: <https://www.merriam-webster.com/dictionary/computed%20tomography>

IPA: /kəmˌpjʊːtɪd təˈmɑːɡrəfi/

Phonetic Spelling: kuhm-pyoo-tuhd tuh-maa-gruh-fee

Parenchymal

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

IPA: /pəˈrɛŋkɪməl/

Phonetic Spelling: puh-reng-kih-muhl