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Title: Robot-Assisted Laparoscopic Splenectomy in Children: A Case Report with Literature Review

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Author Questionnaire

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

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



Interview Statements are read by JoVE's voiceover talent.

Current Protocol Length

Number of Steps: 08

Number of Shots: 20

Interviews

Authors: Please note that **the questions will not appear on screen**. Please answer in **stand-alone full sentence with sufficient context**.

NOTE to VO: Please record introductory and conclusion interview statements.

INTRODUCTION:

~~**REQUIRED:** Briefly describe the clinical case presented in this video and the treatment approach used.~~

- 1.1. Seven-year-old girl with hereditary spherocytosis underwent robot-assisted laparoscopic splenectomy using da Vinci system, achieving minimal blood loss and stable recovery.

1.1.1. B roll: 2.6.1

~~Describe any unique or rare clinical features observed in this case.~~

- 1.2. Case demonstrated extremely low intraoperative blood loss of two milliliters and successful robotic splenectomy despite limited pediatric abdominal working space.

1.2.1. B roll: 2.5.1

CONCLUSION:

~~Describe any important challenges or complications encountered during treatment and how they were managed~~

- 1.3. Limited pediatric abdominal space and risk of pancreatic injury were managed using precise robotic articulation, careful dissection, and optimized trocar placement.

1.3.1. B roll: 2.1.2 and 2.2.2

~~Describe how the patient's condition has progressed following treatment.~~

- 1.4. Postoperative recovery was uneventful, with normalized hematologic parameters, and no complications at three-month follow-up evaluation.

1.4.1. B roll: LAB MEDIA: table 1

Ethics Title Card

This research has been approved by the Clinical Research Ethics Committee of the Xiangyang Central Hospital, Affiliated Hospital of Hubei University of Arts and Sciences

Protocol

2. Pediatric Robotic-Assisted Laparoscopic Splenectomy for Hereditary Spherocytosis

Demonstrator: Yongkang Zhang and Xiaofeng Liao

2.1. After preparing the patient and creating an optical access port, pneumoperitoneum was established using a Veress needle with the intra-abdominal pressure maintained at 10 millimeters of mercury [1]. Trocars of appropriate sizes were subsequently placed: one at the right upper abdomen between the midclavicular line and the midline at the umbilical level, one along the left anterior axillary line at the umbilical level, and one through a 1.2-centimeter incision in the left lower abdomen to serve as an auxiliary port [2].

2.1.1. LAB MEDIA: 69646-1 00:00 – 00:15

2.1.2. LAB MEDIA: 69646-1 00:16-00:25 and 00:40 – 00:49

2.2. The robotic arms of the surgical system were subsequently docked. An electrocautery hook [1], bipolar forceps [2] and an ultrasonic scalpel were inserted through the trocars accordingly [3].

2.2.1. LAB MEDIA: 69646-1 08:52 – 09:00 *Video editor: Show all the instruments entering the surgical site*

2.2.2. LAB MEDIA: 69646-1 10:35 – 10:40

2.2.3. LAB MEDIA: 69646-1 15:53 – 16:01

2.3. The gastrosplenic ligament was divided with an ultrasonic scalpel [1], and the short gastric vessels and superior polar vessels of the spleen were successively ligated and transected [2].

2.3.1. LAB MEDIA: 69646-1 17:16 – 17:20 and 18:00-18:05

2.3.2. LAB MEDIA: 69646-1 20:36 – 20:41, and 22:35 – 22:42

2.4. The adhesions between the pancreatic tail and the lower splenic pole were carefully dissected using an electrocautery hook [1], and the splenocolic ligament was divided [2]. After exposing the splenic pedicle vessels along the superior border of the pancreas, suture ligation was performed [3], followed by Hem-o-lok clip application [4] and vessel transection [5].

2.4.1. LAB MEDIA: 69646-1 28:10 – 28:15 and 28:48 – 28:55

2.4.2. LAB MEDIA: 69646-1 29:25 – 29:45

2.4.3. LAB MEDIA: 69646-2 00:02-00:08, 07:20 –07:25 and 07:45-07:51

2.4.4. LAB MEDIA: 69646-2 20:38-20:41 and 20:48-20:50

2.4.5. LAB MEDIA: 69646-2 21:55 – 22:04

2.5. The splenophrenic and splenorenal ligaments were subsequently divided, with care taken to avoid injury to the splenic hilum and the pancreatic tail [1].

2.5.1. LAB MEDIA: 69646-2 22:23 – 22:40

2.6. Then, the spleen was completely mobilized [1].

2.6.1. LAB MEDIA: 69646-2 23:21 – 23:31

2.7. After placement in a specimen retrieval bag [1], the spleen was morcellated [2] and extracted in pieces through the umbilical incision. All resected specimens were sent for histopathological analysis [3].

2.7.1. LAB MEDIA: 69646-3 02:50-03:00

2.7.2. LAB MEDIA: 69646-3 04:45 – 05:00

2.7.3. LAB MEDIA: 69646-3 17:50 – 17:56

2.8. Following splenectomy, the abdominal cavity was thoroughly inspected [1]. After confirming hemostasis, particularly at the splenic bed, pancreatic tail, and along the greater curvature of the stomach, a closed-suction drain was placed in the splenic fossa under laparoscopic guidance [2]. Finally, the robotic arms and trocars were withdrawn, and the abdominal wall was closed in layers [3].

2.8.1. LAB MEDIA: 69646-4 02:45 – 03:00

2.8.2. LAB MEDIA: 69646-4 03:50 – 04:03

2.8.3. LAB MEDIA: 69646-4 05:25 – 05:32

Results

3. Results

3.1. The 7-year-old girl with hereditary spherocytosis successfully underwent the robot-assisted surgery [1]. The total operative time was 145 minutes, including 35 minutes for docking and 110 minutes for console time [2].

3.1.1. LAB MEDIA: Table 1.

3.1.2. LAB MEDIA: Table 1. *Video editor: Highlight the row labeled day 0.*

3.2. On postoperative day 1, pyrexia with a maximum temperature of 38.6 degrees Celsius was observed and later resolved with intravenous cefoperazone and acetaminophen administration [1].

3.2.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "postoperative day 1"*

3.3. Flatus was observed on postoperative day 2 [1].

3.3.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "postoperative day 2" showing "flatus".*

3.4. A liquid diet was initiated on postoperative day 3 [1].

3.4.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "postoperative day 3" showing "initiation of oral diet" and "a liquid diet was started".*

3.5. The abdominal drainage tube was removed on postoperative day 4 [1].

3.5.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "postoperative day 4"*

3.6. A blood test performed on postoperative day 3 revealed an increase in platelet count. Dipyridamole was administered at a dose of 3 milligrams per kilogram per day for treatment [1], and blood counts were monitored dynamically to ensure normalization [2].

3.6.1. LAB MEDIA: Table 1. *Video editor: Highlight the row for "postoperative day 3"*

3.6.2. LAB MEDIA: Figure 3. *Video editor: Show A and highlight the data curve after 2 points from the red triangle, towards the right side.*

Pronunciation Guide:

1. Pediatric
Pronunciation link: <https://www.merriam-webster.com/dictionary/pediatric>
IPA: /ˌpiːdiˈætrɪk/
Phonetic Spelling: pee-dee-AT-rik
2. Robotic-Assisted
Pronunciation link: <https://www.merriam-webster.com/dictionary/robotic>
IPA: /roʊˈbɑːtɪk əˈsɪstɪd/
Phonetic Spelling: roh-BAA-tik uh-SIS-tid
3. Laparoscopic
Pronunciation link: <https://www.merriam-webster.com/dictionary/laparoscopic>
IPA: /ˌləpərəˈskoːpɪk/
Phonetic Spelling: lap-uh-ruh-SKAA-pik
4. Splenectomy
Pronunciation link: <https://www.merriam-webster.com/dictionary/splenectomy>
IPA: /splɪˈnektəmi/
Phonetic Spelling: splee-NEK-tuh-mee
5. Hereditary
Pronunciation link: <https://www.merriam-webster.com/dictionary/hereditary>
IPA: /həˈredəˌteri/
Phonetic Spelling: huh-RED-uh-ter-ee
6. Spherocytosis
Pronunciation link: <https://www.merriam-webster.com/dictionary/spherocytosis>
IPA: /ˌsfɪrəʊsaɪˈtoʊsɪs/
Phonetic Spelling: sfeer-oh-sye-TOH-sis
7. Pneumoperitoneum
Pronunciation link: <https://www.merriam-webster.com/dictionary/pneumoperitoneum>
IPA: /ˌnuːməʊˌperətəˈniːəm/
Phonetic Spelling: noo-moh-peh-ruh-tuh-NEE-um
8. Veress
Pronunciation link: <https://www.howtopronounce.com/veress>
IPA: /ˈverɛs/
Phonetic Spelling: VER-es
9. Intra-abdominal
Pronunciation link: <https://www.merriam-webster.com/dictionary/intra-abdominal>
IPA: /ˌɪntrəɛbˈdɑːmənəl/
Phonetic Spelling: in-truh-ab-DAA-muh-nuhl
10. Trocars
Pronunciation link: <https://www.merriam-webster.com/dictionary/trocar>
IPA: /ˈtroʊˌkɑːr/
Phonetic Spelling: TROH-kar

11. Midclavicular
Pronunciation link: <https://www.merriam-webster.com/dictionary/midclavicular>
IPA: /ˌmɪdˌkləˈvɪkjələr/
Phonetic Spelling: mid·kluh·VIK·yuh·ler
12. Umbilical
Pronunciation link: <https://www.merriam-webster.com/dictionary/umbilical>
IPA: /ˌʌmˈbɪlɪkəl/
Phonetic Spelling: um·BIL·ih·kuhl
13. Auxiliary
Pronunciation link: <https://www.merriam-webster.com/dictionary/auxiliary>
IPA: /ɔːgˈzɪljəri/
Phonetic Spelling: awg·ZIL·yuh·ree
14. Electrocautery
Pronunciation link: <https://www.merriam-webster.com/dictionary/electrocautery>
IPA: /ɪˌlektroʊˈkɔːtəri/
Phonetic Spelling: ih·lek·troh·KAW·tuh·ree
15. Bipolar
Pronunciation link: <https://www.merriam-webster.com/dictionary/bipolar>
IPA: /ˌbaɪˈpoʊlər/
Phonetic Spelling: bye·POH·ler
16. Ultrasonic
Pronunciation link: <https://www.merriam-webster.com/dictionary/ultrasonic>
IPA: /ˌʌltrəˈsɔːnɪk/
Phonetic Spelling: uhl·truh·SAA·nik
17. Gastrosplenic
Pronunciation link: <https://www.merriam-webster.com/dictionary/gastrosplenic>
IPA: /ˌgæstroʊˈsplɪːnɪk/
Phonetic Spelling: gas·troh·SPLEE·nik
18. Ligament
Pronunciation link: <https://www.merriam-webster.com/dictionary/ligament>
IPA: /ˈlɪgəmənt/
Phonetic Spelling: LIG·uh·muhnt
19. Ligation
Pronunciation link: <https://www.merriam-webster.com/dictionary/ligation>
IPA: /laɪˈgeɪʃən/
Phonetic Spelling: lye·GAY·shuhn
20. Transected
Pronunciation link: <https://www.merriam-webster.com/dictionary/transect>
IPA: /trænˈsektɪd/
Phonetic Spelling: tran·SEK·tid
21. Pancreatic
Pronunciation link: <https://www.merriam-webster.com/dictionary/pancreatic>

IPA: /,pæŋkri'ætɪk/
Phonetic Spelling: pan·kree·AT·ik

22. Splenic

Pronunciation link: <https://www.merriam-webster.com/dictionary/splenic>
IPA: /'splɪ:nɪk/
Phonetic Spelling: SPLEE·nik

23. Splenocolic

Pronunciation link: <https://www.merriam-webster.com/dictionary/splenocolic>
IPA: /,splɪ:nɒs'kɔ:lɪk/
Phonetic Spelling: splee·noh·KAA·lik

24. Pedicle

Pronunciation link: <https://www.merriam-webster.com/dictionary/pedicle>
IPA: /'pedɪkəl/
Phonetic Spelling: PED·ih·kuhl

25. Hem-o-lok

Pronunciation link: No confirmed link found
IPA: /'hi:mɒs,lɔ:k/
Phonetic Spelling: HEE·moh·laak

26. Splenophrenic

Pronunciation link: <https://www.merriam-webster.com/dictionary/splenophrenic>
IPA: /,splɪ:nɒs'frenɪk/
Phonetic Spelling: splee·noh·FREN·ik

27. Splenorenal

Pronunciation link: <https://www.merriam-webster.com/dictionary/splenorenal>
IPA: /,splɪ:nɒs'ri:nəl/
Phonetic Spelling: splee·noh·REE·nuhl

28. Hilum

Pronunciation link: <https://www.merriam-webster.com/dictionary/hilum>
IPA: /'hɪləm/
Phonetic Spelling: HYE·luhm

29. Mobilized

Pronunciation link: <https://www.merriam-webster.com/dictionary/mobilized>
IPA: /'moʊbəˌlaɪzd/
Phonetic Spelling: MOH·buh·lyzed

30. Morcellated

Pronunciation link: <https://www.merriam-webster.com/dictionary/morcellate>
IPA: /'mɔ:rsəˌleɪtɪd/
Phonetic Spelling: MOR·suh·lay·tid

31. Resected

Pronunciation link: <https://www.merriam-webster.com/dictionary/resect>
IPA: /rɪ'sektɪd/
Phonetic Spelling: rih·SEK·tid

32. Histopathological

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

IPA: /ˌhɪstəʊˌpæθəˈlɑːdʒɪkəl/

Phonetic Spelling: his-toh-path-uh-LAA-jih-kuhl

33. Hemostasis

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

IPA: /ˌhiːmoʊˈsteɪsɪs/

Phonetic Spelling: hee-moh-STAY-sis

34. Curvature

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

IPA: /ˈkɜːrvətʃər/

Phonetic Spelling: KUR-vuh-cher

35. Fossa

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

IPA: /ˈfɑːsə/

Phonetic Spelling: FAA-suh

36. Laparoscopic

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

IPA: /ˌlæpərəˈskɑːpɪk/

Phonetic Spelling: lap-uh-ruh-SKAA-pik