

Submission ID #: 68969

Scriptwriter Name: Pallavi Sharma

Project Page Link: <https://review.jove.com/account/file-uploader?src=21035593>

Title: Single-port Robotic Transanal Total Mesorectal Excision in a Porcine Model (*Sus scrofa domesticus*)

Authors and Affiliations:

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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: 2026/05/30

When you are ready to submit your video files, please contact our Content Manager, [Utkarsh Khare](#).

Current Protocol Length

Number of Steps: 08

Number of Shots: 12

Introduction

NOTE to VO: Please record the interview and conclusion statements

INTRODUCTION:

~~REQUIRED: Summarize your research focus and the main questions it aims to answer.~~

- 1.1. This research focuses on evaluating a novel single-port robotic platform for transanal rectal surgery and assessing its feasibility in a porcine model.

- 1.1.1. [2.8.1](#)

~~Describe the research gap or limitation in existing methods and how this protocol addresses them.~~

- 1.2. Current robotic transanal total mesorectal excision systems are limited by high costs and availability; this protocol introduces a flexible, cost-effective alternative platform.

- 1.2.1. [2.3.1](#)

CONCLUSION:

~~What does this protocol allow researchers to study or measure?~~

- 1.3. This protocol measures robotic transanal total mesorectal excision feasibility, operative time, blood loss, and short-term outcomes.

- 1.3.1. [2.6.1](#)

Describe the most important consideration or challenge when performing this protocol.

- 1.4. A key challenge during this protocol is the persistent risk of urethral injury during anterior dissection, despite robotic assistance.

- 1.4.1. [2.7.2](#)

Ethics Title Card

This research has been approved by the Institutional Animal Care and Use Committee at Daping Hospital, Army Medical University

Protocol

NOTE: Protocol is filmed using the provided footage

2. Surgical Procedure for Robotic Transanal Total Mesorectal Excision

Demonstrator: Fan Li

2.1. After preparing a healthy female pig for the procedure, identify the inferior mesenteric artery, skeletonize the vessels, and perform lymphadenectomy at its root, using electrocautery cautiously to minimize thermal damage to surrounding tissues [1].

2.1.1. LAB MEDIA: 68969-3.mp4: 09:12-09:14, 09:20-09:30, 09:40-09:50

2.2. Clip and divide the inferior mesenteric artery distal to the origin of the left colic artery while preserving the left colic artery to maintain blood supply to the proximal colon [1].

2.2.1. LAB MEDIA: 68969-3.mp4: 10:15-10:20, 10:35-10:40

2.3. Then, mobilize the sigmoid colon by dissecting along the mesocolic plane. Continue mobilization of the descending colon along the same plane [1].

2.3.1. LAB MEDIA: 68969-3.mp4: 22:40-23:20

2.4. Perform pelvic dissection following the mesorectal plane and continue dissection down to the level of the peritoneal reflection [1].

2.4.1. LAB MEDIA: 68969-4.mp4: 09:46-10:00

2.5. Once the animal is prepared for robotic trans anal phase, perform a full-thickness circumferential proctectomy 1.0 centimeters distal to the purse-string suture [1].

2.5.1. LAB MEDIA: 68969-5.mp4: 19:14-20:00

2.6. Enter the mesorectal plane and initiate bottom-up dissection [1]. Dissect posteriorly along the avascular plane toward the sacrum [2].-

2.6.1. LAB MEDIA: 68969-5.mp4: 21:45-21:50, 25:16-25:20

2.6.2. LAB MEDIA: 68969-6.mp4: 23:50-24:17

2.7. Continue lateral dissection while carefully preserving the neurovascular bundles [1]. Proceed anteriorly to separate the rectum from adjacent pelvic structures [2]. Then,

extend the dissection cranially toward the peritoneal reflection [3].

2.7.1. LAB MEDIA: 68969-6.mp4: 02:50-03:10

2.7.2. LAB MEDIA: 68969-6.mp4: 05:30-05:40, 06:30-06:40

2.7.3. LAB MEDIA: 68969-6.mp4: 14:27-15:00

2.8. Extract the resected rectum and mesorectum transanally through the access port [1].
Perform a hand-sewn coloanal anastomosis under direct visualization using interrupted absorbable sutures, followed by closure of the abdominal incision [2].

2.8.1. LAB MEDIA: 68969-7.mp4: 07:50-07:55, 11:07-11:15

2.8.2. LAB MEDIA: 68969-6.mp4: 15:26-15:56

1. Transanal
Pronunciation link: <https://www.merriam-webster.com/medical/transanal>
IPA: /trænz'eiəl/
Phonetic Spelling: tranz·ay·nuhl
2. Rectal
Pronunciation link: <https://www.merriam-webster.com/dictionary/rectal>
IPA: /'rɛktəl/
Phonetic Spelling: REK·tuhl
3. Feasibility
Pronunciation link: <https://www.merriam-webster.com/dictionary/feasibility>
IPA: /,fi:zə'bɪləti/
Phonetic Spelling: fee·zuh·BIH·luh·tee
4. Porcine
Pronunciation link: <https://www.merriam-webster.com/dictionary/porcine>
IPA: /'pɔ:r,sain/
Phonetic Spelling: POR·syne
5. Mesorectal
Pronunciation link: No confirmed link found
IPA: /,mezoo'rɛktəl/
Phonetic Spelling: mez·oh·REK·tuhl
6. Excision
Pronunciation link: <https://www.merriam-webster.com/dictionary/excision>
IPA: /ɪk'sɪʒən/
Phonetic Spelling: ik·SIH·zhuhn
7. Operative
Pronunciation link: <https://www.merriam-webster.com/dictionary/operative>
IPA: /'ɑ:pəreɪv/
Phonetic Spelling: AA·puh·ruh·tiv
8. Urethral
Pronunciation link: <https://www.merriam-webster.com/dictionary/urethral>
IPA: /jʊ'ri:θrəl/
Phonetic Spelling: yoo·REE·thruhl
9. Anterior
Pronunciation link: <https://www.merriam-webster.com/dictionary/anterior>
IPA: /æn'tɪriər/
Phonetic Spelling: an·TEER·ee·er
10. Dissection
Pronunciation link: <https://www.merriam-webster.com/dictionary/dissection>
IPA: /dɪ'sɛkʃən/
Phonetic Spelling: dih·SEK·shuhn
11. Institutional
Pronunciation link: <https://www.merriam-webster.com/dictionary/institutional>
IPA: /,ɪnstə'tu:ʃənəl/
Phonetic Spelling: in·stuh·TOO·shuh·nuhl

12. Mesenteric
Pronunciation link: <https://www.merriam-webster.com/dictionary/mesenteric>
IPA: /ˌmɛzənˈtɛrɪk/
Phonetic Spelling: mez·uhn·TEH·rik
13. Skeletonize
Pronunciation link: <https://www.merriam-webster.com/dictionary/skeletonize>
IPA: /ˈskɛlətn̩ˌaɪz/
Phonetic Spelling: SKEL·uh·tuhn·ize
14. Lymphadenectomy
Pronunciation link: <https://www.merriam-webster.com/medical/lymphadenectomy>
IPA: /ˌlɪmfˌædəˈnɛktəmi/
Phonetic Spelling: limf·ad·uh·NEK·tuh·mee
15. Electrocautery
Pronunciation link: <https://www.merriam-webster.com/medical/electrocautery>
IPA: /ɪˌlɛktroʊˈkɔːtəri/
Phonetic Spelling: ih·lek·troh·KAW·tuh·ree
16. Thermal
Pronunciation link: <https://www.merriam-webster.com/dictionary/thermal>
IPA: /ˈθɜːməl/
Phonetic Spelling: THUR·muhl
17. Distal
Pronunciation link: <https://www.merriam-webster.com/dictionary/distal>
IPA: /ˈdɪstəl/
Phonetic Spelling: DIS·tuhl
18. Colic
Pronunciation link: <https://www.merriam-webster.com/dictionary/colic>
IPA: /ˈkɑːlɪk/
Phonetic Spelling: KAA·lik
19. Proximal
Pronunciation link: <https://www.merriam-webster.com/dictionary/proximal>
IPA: /ˈprɔːksəməl/
Phonetic Spelling: PRAAK·suh·muhl
20. Sigmoid
Pronunciation link: <https://www.merriam-webster.com/dictionary/sigmoid>
IPA: /ˈsɪɡˌmɔɪd/
Phonetic Spelling: SIG·moyd
21. Mesocolic
Pronunciation link: No confirmed link found
IPA: /ˌmɛzoʊˈkɑːlɪk/
Phonetic Spelling: mez·oh·KAA·lik
22. Peritoneal
Pronunciation link: <https://www.merriam-webster.com/dictionary/peritoneal>
IPA: /ˌpɛrətəˈniːəl/
Phonetic Spelling: peh·ruh·tuh·NEE·uhl

23. Circumferential
 Pronunciation link: <https://www.merriam-webster.com/dictionary/circumferential>
 IPA: /səˌkʌmfəˈrɛnsəl/
 Phonetic Spelling: ser·kum·fuh·REN·shuhl
24. Proctectomy
 Pronunciation link: <https://www.merriam-webster.com/medical/proctectomy>
 IPA: /prɑːkˈtɛktəmi/
 Phonetic Spelling: praak·TEK·tuh·mee
25. Posteriorly
 Pronunciation link: <https://www.merriam-webster.com/dictionary/posteriorly>
 IPA: /pɑːˈstriəri/lee
 Phonetic Spelling: paa·STEER·ee·er·lee
26. Avascular
 Pronunciation link: <https://www.merriam-webster.com/dictionary/avascular>
 IPA: /ˌeɪˈvæskjələr/
 Phonetic Spelling: ay·VAS·kyuh·ler
27. Sacrum
 Pronunciation link: <https://www.merriam-webster.com/dictionary/sacrum>
 IPA: /ˈsækrəm/
 Phonetic Spelling: SAK·ruhm
28. Neurovascular
 Pronunciation link: <https://www.merriam-webster.com/medical/neurovascular>
 IPA: /ˌnʊroʊˈvæskjələr/
 Phonetic Spelling: noor·oh·VAS·kyuh·ler
29. Cranially
 Pronunciation link: <https://www.merriam-webster.com/medical/cranial>
 IPA: /ˈkreɪniəli/
 Phonetic Spelling: KRAY·nee·uh·lee
30. Mesorectum
 Pronunciation link: No confirmed link found
 IPA: /ˌmɛzoʊˈrɛktəm/
 Phonetic Spelling: mez·oh·REK·tuhm
31. Anastomosis
 Pronunciation link: <https://www.merriam-webster.com/dictionary/anastomosis>
 IPA: /əˌnæstəˈmoʊsis/
 Phonetic Spelling: uh·nas·tuh·MOH·sis
32. Visualization
 Pronunciation link: <https://www.merriam-webster.com/dictionary/visualization>
 IPA: /ˌvɪʒʊələˈzeɪʒən/
 Phonetic Spelling: vɪzh·oo·uh·luh·ZAY·shuhn
33. Absorbable
 Pronunciation link: <https://www.merriam-webster.com/dictionary/absorbable>
 IPA: /əbˈzɔːrəbəl/
 Phonetic Spelling: uhb·ZOR·buh·buhl

