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**Title: Prone Lateral Minimally Invasive Retropleural Corpectomy Using a Rotatable Radiolucent Jackson Table**

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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. 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**

**4. Proposed filming date:** To help JoVE process and publish your video in a timely manner, please indicate the proposed date that your group will film here: **all done**

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

### Current Protocol Length

Number of Steps: 12

Number of Shots: 17

# Introduction

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- 1.1. **Yu-Cheng Yeh:** Recently, single position dual approach surgery has gain attention for its ability to enhance operating room efficiency, here, we propose a prone lateral surgical technique by utilizing rotatable Jackson table. Spinal surgeon can easily switch from the posterior approach by rotating Jackson table without need for re-draping and repositioning the patients.

1.1.1. INTERVIEW: LAB MEDIA: 68280.0.0 Introduction : 00:23-00:49 . [Suggested B-roll: 2.3.1](#)

What are the current experimental challenges?

- 1.2. **Yu-Cheng Yeh:** The anterolateral approaches to the thoracic spine can be performed via either a transpleural (TP) or retropleural (RP) approach. Typically, one lung ventilation and pleura violation were needed while preforming transpleural approach, and this increase the risk of pulmonary complications such as pleura effusion or pneumonia.

1.2.1. INTERVIEW: LAB MEDIA: 68280.0.0 Introduction 00:00-00:22 . [Suggested B-roll: 2.5.1](#)

What advantage does your protocol offer compared to other techniques?

- 1.3. **Yu-Cheng Yeh:** Combining these two concepts, prone lateral retropleural approach using the ratable Jackson table offer several major advantages, including minimal pleura invasion, enhanced operating room efficiency and familiarity for surgeon to perform posterior procedure in the prone position.

1.3.1. INTERVIEW: LAB MEDIA: 68280.0.0 Introduction 00:50-01:11. [Suggested B-roll: 2.7.1](#)

**Ethics Title Card**

This research has been approved by the Institutional Review Board at the Chang Gung Medical Foundation

# Protocol

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**NOTE: All the footage was given before scripting and all timestamps were added**

## 2. Retropleural Corpectomy Procedure

**Demonstrator:** Yung-Hsueh Hu

2.1. To begin, place pads on the Jackson table, ensuring they do not obstruct the surgical field for a retropleural approach [1].

2.1.1. 68280.1.3 pad\_placement.

2.2. Using the Mizuho Jackson Modular Table System, position the patient prone after the induction of general anesthesia [1-TXT].

2.2.1. File name: 68280.1.4 patient\_in\_prone. **TXT: Place 2 radiolucent lateral positioners on the contralateral side**

2.3. Apply tape to the legs, arms, and head for additional stabilization. Carefully tape the head to the table, ensuring it remains cushioned and free from excess tension during rotation [2].

2.3.1. 68280.1.6 taping.

2.4. Once the patient is fully secured, manually rotate the patient 30 to 40 degrees away from the surgical approach side [1]. For thoracic or thoracolumbar spine procedures, rotate approximately 30 degrees [2].

2.4.1. 68280.1.7.1 final\_stablization.

2.4.2. 68280.1.7.2 patient\_rotation.

2.5. In the rotated prone position, make a skin incision. Perform a circumferential subperiosteal dissection of the rib as dorsally as possible [1].

2.5.1. 68280.2.3.1 rib\_dissect.

2.6. Using a rib cutter and rongeur, resect part of the rib after detaching it from the subcostal neurovascular bundle and parietal pleura [1].

2.6.1. 68280.2.3.2 rib\_cut.

- 2.7. Develop the retropleural space by gently separating the endothoracic fascia from the parietal pleura [1]. Carefully perform a blunt dissection above and below the target disc to minimize parietal pleura injury [2].
  - 2.7.1. 68280.2.4 Retropleural develop 00:00-00:15
  - 2.7.2. 68280.2.4 Retropleural develop. 00:16-00:27
- 2.8. After developing the retropleural space, dock a table-mounted oblique lateral interbody fusion retractor to retract the parietal pleura ventrally [1].
  - 2.8.1. 68280.2.5.2 retractor docking 00:00-00:14.
- 2.9. After fully exposing the surgical corridor, perform annulotomies at the discs above and below the target vertebral body using a scalpel [1]. Then, use a disc shaver and rongeur to carry out discectomy at both levels [2].
  - 2.9.1. 68280.2.6.1 disc\_preparation.
  - 2.9.2. 68280.2.6.2 disc\_preparation.
- 2.10. Carefully remove the targeted vertebral body using an osteotome, rongeur, and high-speed burr [1]. Under a surgical microscope, perform direct decompression and cut the anterior longitudinal ligament if significant angular realignment is necessary [2].
  - 2.10.1. 68280.2.7.3 L1 corpectomy 00:00-00:08 and 68280.2.7.4 L1 Osteotomy.
  - 2.10.2. 68280.2.7.2 ALL release.
- 2.11. To test for pleural integrity, fill the surgical wound with sterile water using a syringe while maintaining the patient in the 30-degree rotated prone position [1]. Begin Ambu bag ventilation; observe for air bubbles on the water's surface, which would indicate a visceral pleura breach requiring chest tube insertion [2].
  - 2.11.1. 68280.2.8 air\_leak\_test 00:00-00:15.
  - 2.11.2. 68280.2.8 air\_leak\_test 00:17-00:26.
- 2.12. After completing the air leak test, rotate the table back to a horizontal position without changing the surgical drapes [1].
  - 2.12.1. 68280.2.9.1 rotate\_back.

# Results

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## 3. Results

- 3.1. 27 consecutive patients underwent single-position prone-lateral retropleural corpectomy [1]. This cohort was compared to 54 patients who underwent a conventional two-stage transpleural approach corpectomy in the decubitus position combined with a posterior approach in the prone position [2].
  - 3.1.1. LAB MEDIA: Table 1 . *Video editor: Highlight the row "Patient number" and the value "27" under "Retropleural approach"*
  - 3.1.2. LAB MEDIA: Table 1. *Video editor: Highlight the row "Patient number" and the value "54" under "Transpleural approach"*
  
- 3.2. Compared to the transpleural group, the retropleural group showed significantly lower values in chest tube placement [1], postoperative drainage duration [2], hospital stay length [3], costophrenic angle blunting [4], pneumonia requiring antibiotic treatment [5], and corpectomy number [6].
  - 3.2.1. LAB MEDIA: Table 2. *Video editor: Highlight the row "Chest tube placement at wound closure" for the column "Retropleural approach"*
  - 3.2.2. LAB MEDIA: Table 2. *Video editor: Highlight the row "Post-op drainage duration" values for the column "Retropleural approach"*
  - 3.2.3. LAB MEDIA: Table 2. *Video editor: Highlight the row "Length of hospital stay" value for the column "Retropleural approach"*
  - 3.2.4. LAB MEDIA: Table 2. *Video editor: Highlight the row "Costophrenic angle blunting on chest x-ray" value for the column "Retropleural approach"*
  - 3.2.5. LAB MEDIA: Table 2. *Video editor: Highlight the row "Pneumonia requiring antibiotic treatment" value for the column "Retropleural approach"*
  - 3.2.6. LAB MEDIA: Table 2. *Video editor: Highlight the row "Corpectomy number" value for the column "Retropleural approach"*
  
- 3.3. Compared to the transpleural group, the retropleural group had significantly higher values in the rate of single-session anterior and posterior procedures [1] and the degree of kyphosis correction [2].
  - 3.3.1. LAB MEDIA: Table 2. *Video editor: Highlight the row "A+P in one anesthesia" for the column "Retropleural approach"*

3.3.2. LAB MEDIA: Table 2. *Video editor: Highlight the row “Cobb angle difference” and the values “ $21.0 \pm 16.5$ ” for the column “Retropleural approach”*