Clinical data

The patient was a 44-year-old woman admitted because of a pulmonary nodule detected by computed tomography (CT). She had seen a doctor because of chest pain 2 weeks previously. Chest CT scan revealed a nodule located in the left lower lobe. The patient had no other symptoms, such as cough, fever, or dyspnea. Three-dimensional (3D) reconstruction of the pulmonary nodules with high-resolution CT showed a mixed density nodule in the left lower lobe of the lung with irregular shape and borders, and spicules, which suggested a malignant lesion. There was no positive sign or supraclavicular lymph node enlargement on physical examination. The patient’s cardiopulmonary function, blood gas analysis, and laboratory tests were normal. She had no medical history. Preoperative stage was cT1aN0M0 (IA). The preoperative data suggested a malignant tumor in the left lower lobe of the lung; therefore, the left inferior lobectomy was performed.

Three-dimensional reconstruction CT shows a mixed density nodules on the left lower lobe of the lung (Figure 1). The lesion was irregular in shape, with spiculation, pleural traction, and multiple visible vessels, but no sign of vascular bundles or vacuoles. The plain scan CT value was about −216 Hu. The anteroposterior diameter of the nodule was 18.2 mm, left-right diameter was 14.8 mm, vertical diameter was 14 mm, and volume was about 507 mm³. The solid part was in the center of the lesion, accounting for nearly half of the nodule.

Operation steps

Anesthesia and body position (1)

After the induction of general anesthesia, the patient was placed in a right lateral decubitus position under double-lumen endotracheal intubation with single-lung (right) ventilation. With his hands placed in front of head, the patient was fixed in the jackknife position (Figure 2).

Ports

A 1.5-cm camera port (for a 12-mm trocar) was created in the 8th intercostal space (ICS) at the left mid axillary line, and three separate 1.0-cm working ports (for 8-mm trocars) were made in the 6th ICS (#1 arm) at the left anterior axillary line, the 8th ICS (#2 arm) at the left posterior axillary line, and the left 7th ICS (#3 arm), 2 cm from the spine. An auxiliary port (for a 12-mm trocar) was made in the 8th ICS near the costal arch (Figure 3).
Figure 1 A nodule located in the left lower lobe. (A) Horizontal section; (B) coronal section; (C) sagittal section; (D) 3D-reconstruction.

Figure 2 Jackknife position.
Figure 3 Ports in the 6th, 7th, and 8th ICS. ICS, intercostal space.

Figure 4 The inferior ligament of left lung was cut, and the No. 9 lymph nodes were resected.

Installation of the surgical arms (1,2)

The robot patient cart is positioned directly above the operating table and then connected. The #2 arm was connected to a bipolar cautery forceps, and the #1 arm was connected to a unipolar cautery hook. An incision protector was used in the auxiliary port.

Surgical procedure (1-5)

See Figures 4-17.

Figure 5 The left mediastinal pleural was opened, the subcarinal lymph node (No. 7) was resected.

Figure 6 The left inferior pulmonary vein was dissected and skeletonized.

Figure 7 The left inferior pulmonary vein was cut with Endo GIA (60 mm-2.5).

Figure 8 The left lower lobe bronchus and artery were dissected and separated.
Figure 9 The lymph nodes around the left lower lobar bronchus (No. 11) were resected.

Figure 10 The left lower lobe bronchus was isolated and suspended with a rubber band.

Figure 11 The left lower lobe bronchus was cut with Endo GIA (60 mm-4.8).

Figure 12 The left lower lobar artery and nearby lymph nodes around (No. 11) were resected.

Figure 13 The left lower lobar artery was isolated.

Figure 14 The left lower lobar artery was cut with Endo GIA (60 mm-2.5).

Figure 15 The interlobar fissure was separated with Endo GIA (60 mm-3.5×3, and 45 mm-3.5×1).

Figure 16 Lymph nodes No. 5 and 6 were resected.
Postoperative condition

Postoperative treatments included anti-inflammatory and phlegm-resolving treatment. The thoracic drainage tube was withdrawn 1 day after surgery, and the patient was discharged 3 days after surgery. No complications were observed during hospitalization.

Pathologic diagnosis was invasive adenocarcinoma of the left lower lobe. All lymph nodes were negative. Postoperative pathological stage was pT1N0M0 (stage IA adenocarcinoma).

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

References


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