Robotic thoracic surgery of the right lower anterior mediastinal mass

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Clinical data

(I) Medical history: the patient visited our outpatient department after he was found to be with a mediastinal mass during health check-up ten days ago. Then, he was admitted in our hospital with a diagnosis of "mediastinal mass". He had no symptom such as chest tightness, shortness of breath, fever, or heart palpitations. His mental status, physical performance, appetite, and sleep were normal, and the body weight did not obviously change. His urination and defecation were normal.

(II) Physical examination: no positive sign was detected during the physical examination at admission.

(III) Auxiliary examination: chest CT showed a cystic mass at the right anterior mediastinum (near the right heart). The tumor had homogeneous density and was sized 4 cm × 3 cm, with smooth margin (*Figure 1*).

Pre-operative preparation

Conventional skin preparation was performed. The planned ports were marked on body surface.

Procedures

Anesthesia and body position

After the induction of general anesthesia, the patient was placed in a left lateral decubitus position under double-lumen endotracheal intubation. With his hands put in front of head, he slightly leaned backwards.

Surgical procedures

(I) Incisions: a 1.2-cm camera port was created in the 6th intercostal space at right posterior axillary line. Two 0.8-cm working ports were created in the 3rd intercostal space at the right middle axillary line and in the 6th intercostal space at the anterior axillary line, respectively (*Figure 2*).

(II) Inspection of the thoracic cavity with the camera and insertion of the robot arms: the endoscopic airtight trocar was inserted through the camera port to establish 8-mmHg artificial pneumothorax, and then the robotic endoscope was inserted for inspecting any adhesion in the thoracic cavity. Under the endoscopic monitoring, the robot trocars were separately inserted via the two working ports, so as to place the #2 robotic arm (left hand) and the #1 robotic arm (right hand). The #2 robotic arm was connected with the bipolar cautery forceps, and the #1 robotic arm with unipolar cautery hook (*Figure 3*).

(III) Inspect the lesion and its relationship with the neighboring tissues/organs: the mass was a cystic lesion in the mediastinum, with limited scope (*Figure 4*).

(IV) Cut open the mediastinal pleura around the cyst, and then separate the lesion closely alongside the cyst wall (*Figure 5*).

(V) Lift the cyst to expose the base of the cyst, and then completely divide and remove the cyst (*Figure 6*).

(VI) After the #1 robotic arm (right hand) and the trocar were removed, the endoscopic retriever was inserted to harvest the cyst (*Figure 7*).

(VII) Inspection showed that there was no obvious bleeding or exudate on the wound surface. The

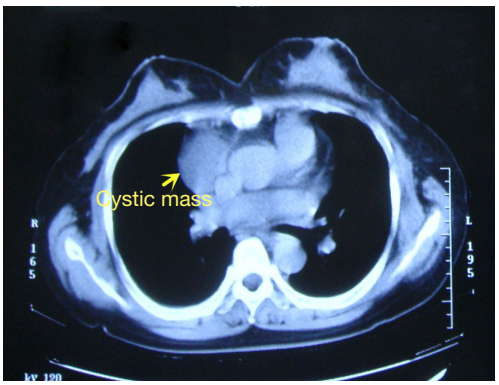

Figure 1 Chest CT shows the mass has homogeneous density and is located near the pericardium.

Figure 2 With the patient's body slightly leaned backwards, the gravity facilitates the separation and exposure of the mass; meanwhile, the adequate extension of the intercostal spaces is helpful for the insertion of mechanical arms.

Figure 3 No adhesion was found inside the thoracic cavity. The #2 robotic arm is connected with bipolar cautery forceps, and #1 robotic arm with unipolar cautery hook.

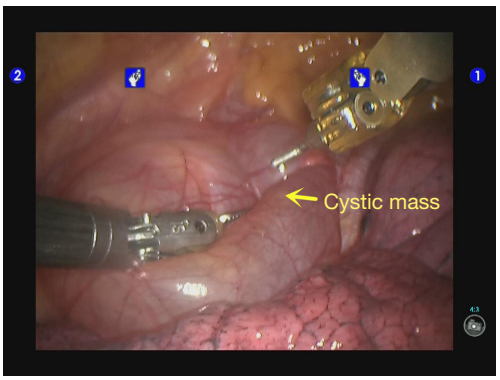

Figure 4 The lesion is cystic and has intact capsule.

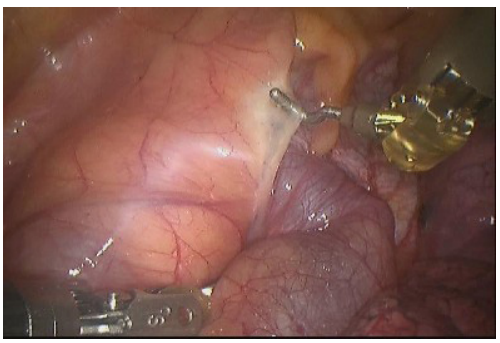

Figure 5 Separate the cyst along the proper capsule.

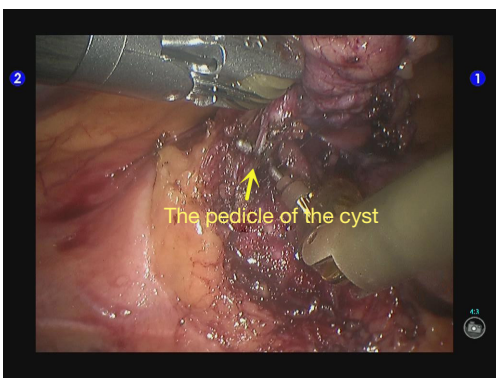

Figure 6 The pedicle of the cyst is connected with the bottom of the pericardium.

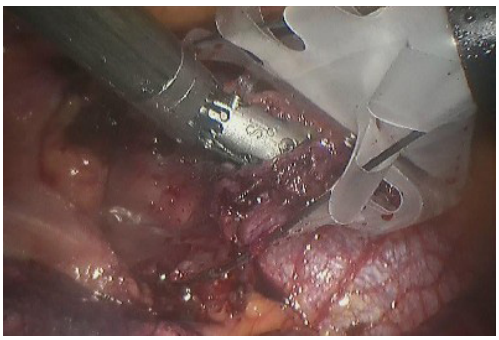

Figure 7 An extraction bag was inserted to harvest the specimen.

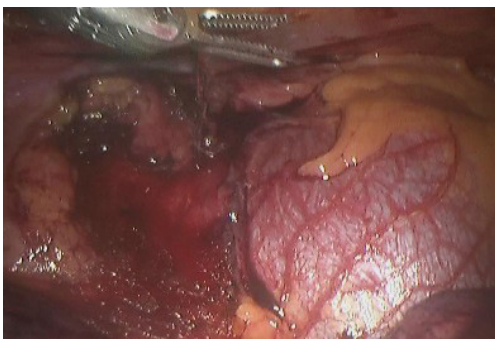

Figure 8 The dissolved hemostatic gauze glue was sprayed on the wound surface inside the mediastinum.

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dissolved hemostatic gauze glue was sprayed on the wound surface, and then the robotic system was withdrawn (*Figure 8*).

(VIII) The thoracic drainage tube was indwelled at the camera port. Close the chest after sputum suctioning and lung recruitment. The intraoperative blood loss was 10 mL. While no blood was transfused, and 600 mL of fluid was transfused.

Postoperative treatment

Routine phlegm-resolving and hemostatic treatment was applied after the surgery.

Pathological diagnosis

The tissue sent for pathological examination was sized 3.5 cm × 2.0 cm × 1.0 cm, grey-white or grey-red in color, and moderately hard. It was pathologically diagnosed as an epithelial cyst at the right anterior mediastinum.

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