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Clinical Video

How to Do a Robotic Resection of Posterior and Inferior Mediastinum Lessions

Anna Muñoz Fos, Anna Ureña, Ricard Ramos, Ivan Macía, Francisco Rivas, Carlos Déniz, Camilo Moreno, Inés Serratosa, Marta García and Ignacio Escobar*

Department of Thoracic Surgery, Bellvitge University Hospital, Spain

Abstract

Despite the use of robotic surgery is becoming more popular among thoracic surgeons worldwide and the benefits of the robotic resection of anterior mediastinal lessions have been well established, there remains controversy over the best robotic approach for resection of posterior and inferior mediastinum. In this paper, we propose some tips to do those resections easily.

Introduction

Benefits of the robotic resection of anterior mediastinal lessions, such as thymoma or thymectomy for Myasthenia Gravis, have been reported [1]. The patient positioning, port placement, and optimal location of the robot relative to the patient for anterior mediastinal pathologies are well described and reproducible [1,2]. However, when the pathology is located in the inferior or posterior mediastinum, a robotic approach can be challenging. In this case is necessary to do some modifications. We propose a robotic approach to do the resection of posterior and inferior mediastinal lesion easily.

Case Presentation

We present a healthy 45-year-old female with an incidental finding of a posterior mediastinal lesion discovered due to a chest computed tomography scan performed into the context of pneumonia with pleural effusion secondary to COVID-Vaccine administration. Computed tomography demonstrated a posterior mediastinal paraaortic lesion of 60 mm × 44 mm. PET revealed a low-metabolic lesion. Therefore, the morfo metabolic valoration suggested a benign

or low-aggressivity lesion, moreover, suggestive of a cyst. Finally, after one year of surveillance imaging, due to the persistence of chest pain and own-decision of the patient, surgical resection with a minimally invasive approach with Robotic Assisted Surgery (RATS) was decided.

Technique

When the lession is located in left posterior and inferior mediastinum the patient is posicionated in a right lateral decubitus position. The robot is driven in parallel to the patient, coming alongside of the patient's back, posteriorly and from the patient's feet [1,3] (Figure 1). We advice a best exposure of the anatomy when a right-side configuration was selected in the robot device even thought left-side was the hemi-thorax to operated. We did a completely portal robotic resection, using the four robotic arms (assistant-port is not necessary). In this way, we perform 4 incisions (Figure 2). First incision can be made anteriorly in the patient, in the anterior axillary line, in the 6th or 7th intercostal space, for portal number 4 (robotic-arm: 4). Second incision is performed in the posterior axillary line, in the same 6th or 7th intercostal space for portal 3 (robotic-arm: 3).; the last two incision are performed posteriorly, behind the tip of the scapula, in the 6th or 7th intercostal space, for portal 2 and 1 respectively (robotic-arm: 2 and 1). In our case we used the 6th intercostal space for the two anterior ports and the 7th intercostal space for the posterior ones because of stale adherences found (Figure 2). We think that is not strictly necessary to do all ports in the same space: There are no solid studies showing a benefit when the same intercostal space is used for robotic surgery. We think that the pain may lie in performing the procedure efficiently and as quick as possible. Cadiere forceps was allocated in arm 1, optic in the 3-arm, and fenestrated bipolar and Maryland® bipolar forceps were indistinctly installed into arm 2 or 4 depending of the need of the surgery.

In our case, after excision of adherences was performed, we retracted the lung anteriorly with the aid of the cadiere forceps in

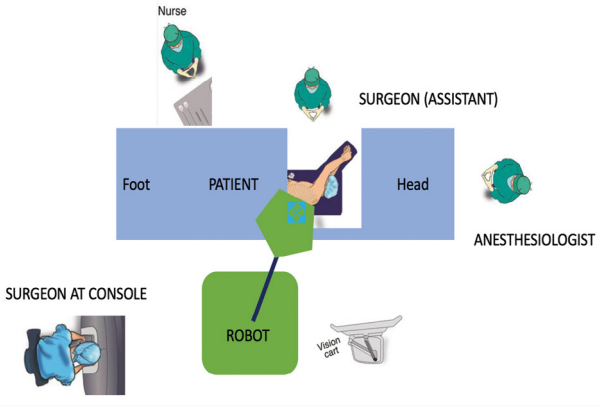

Figure 1: Distribution of the operation room: The robot is driven in parallel to the patient, coming alongside of the patient's back, posteriorly and from the patient's feet.

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***Corresponding author:** Anna Munoz Fos, Department of Thoracic Surgery, Bellvitge University Hospital, Carrer de la Feixa Llarga, s/n, 08907 L'Hospitalet de Llobregat, Barcelona, Spain, E-mail: amunozf@bellvitgehospital.cat

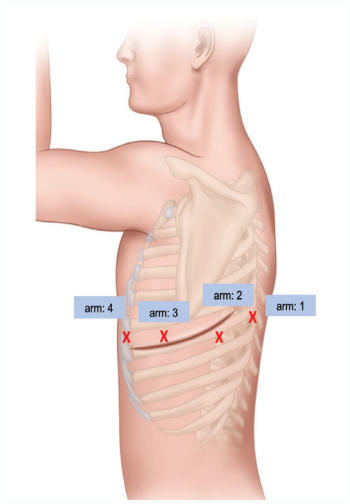

Figure 2: Port placement. First incision: in the anterior axillary line, for portal number 4 (robotic-arm: 4). Second incision: posterior axillary line, for portal 3 (robotic-arm: 3); the last two incision are performed posteriorly, behind the tip of the scapula, for portal 2 and 1 respectively (robotic-arm: 2 and 1). All of them in 6th or 7th intercostal space.

order to expose the posterior mediastinum and identify the lesion allocated lateral to Aorta. We used self-hand made rolled-gauzes to avoid clawing the lung. After the lesion was identified in the posterior and lower mediastinum, it can be separated from the main structures: first, from the lung, and after that, from the Aorta and diaphragm.

Finally, the piece can be taken out with the aid of a expansible thoracoscopic bag through the most anterior incision. We recommend to place one 28F chest tube in the thorax after the surgery.

Results

The patient was discharged to home at 1st postoperative day without any complications. The histopathologic study revealed a cyst lesion compatible with the diagnosis of bronchogenic cyst.

One year after the operation, the patient was completely asymptomatic and chest radiography revealed no sign of recurrence.

Discussion

Robotic surgery is an approach with less morbidity and shorter hospital stay compared to open thoracotomy, and similar when compared with traditional Video-Assisted Thoracic Surgery (VATS) [1-5].

Robotic-Assisted Thoracic Surgery (RATS) and Video-Assisted Thoracic Surgery (VATS) can indistinctly used forth resection of posterior mediastinal lessions; nevertheless, we think that robotic surgery offers some advantages: First of all, robotic surgery allows an optimal view for confined and narrow spaces, such as the posterior and lower mediastinum. This view cannot be compared with video as sited thoracoscopic surgery. Second, the use of CO2 allows an easy dissection and identification of structures. Moreover, the robotic surgery provides three-dimensional visualization in a magnified operative field and an increased articulation of robotic instruments when compared with Video-Assisted Thoracic Surgery (VATS) (Video).

Link: https://youtu.be/ihVbgIrpnCA

Optimal location of the robot relative to the patient, an adequate port placement and suitable docking are essential for an easy and reproducible surgery.

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