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Case Report

Simultaneous excision of intrathoracic solitary fibrous tumor and retroperitoneal schwannoma with robot-assisted surgery

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ABSTRACT

Pleural solitary fibrous tumor is a rare neoplasms of the thoracic cavity. Retroperitoneal schwannomas are typically benign, solitary and encapsulated lesions. A previously healthy 39-year-old female patient was examined due to prolonged menstruation. The examination of the patient incidentally revealed two rare neoplasms both in the thoracic cavity and in the retroperitoneal space. The patient underwent simultaneous robot-assisted excision of intrathoracic solitary fibrous tumor and retroperitoneal schwannoma. This case emphasizes that simultaneous robot-assisted surgery for the resection of small masses in the posterior mediastinum and retroperitoneal region may be appropriate in selected patients.

Keywords: solitary fibrous tumor, robot asisted surgery, schwannoma

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Introduction

Solitary fibrous tumor (SFT) is a rare spindle cell tumor of mesenchymal origin that first described by Klemperer et al [1]. Most of the benign SFTs originate from the visceral pleura and usually extend into the pleural cavity. These lesions, which can also be seen in various extrapleural thoracic locations, including the pericardium, heart, lungs and mediastinum, affect men and women equally [2]. They are usually asymptomatic and the diagnosis is mostly incidental. Chest X-ray, computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography (PET) are helpful in diagnosis. The current standard approach is curative surgery which aimed the complete resection of the tumor that provides the best prognosis [3].

Schwannomas are rare, typically benign, solitary and encapsulated lesions. These benign neoplasms originating from Schwann cells of the peripheral nerve sheath represent less than 1% of all primary retroperitoneal tumors [4]. Radical resection without disrupting the integrity of the capsule is the mainstay of treatment for primary retroperitoneal schwannomas, otherwise recurrence has been reported in 5-10% of cases [5].

In this article, a simultaneous excision of intrathoracic solitary fibrous tumor and retroperitoneal schwannoma using the robot-assisted system.

Case Report

A previously healthy 39-year-old female patient was examined due to prolonged menstruation. She was a nonsmoker with no significant medical history. Physical examination was within normal limits. In the abdominal MRI scan, a 23 mm solid lesion was observed adjacent to the lower pole of the left kidney (Figure 1). Additionally a mass measuring 44 × 35 mm in the right paravertebral area was also seen in this scan. A simultaneous minimally invasive surgery for excision of both lesions was planned.

In the first stage, four robotic trocars were placed after the patient was positioned the left flank. After docking, the robotic arms were connected to the trocars and the instruments were placed in the abdomen. The Toldt line was incised and the intestinal structures were medialized and removed from the operation line. Gerato's fascia and kidney lower pole were observed. A solid mass with a size of 2.5 × 2 cm was seen in the Gerato's facia, separate from the kidney tissue. Total excision was performed with the appropriate surgical margins and without deterioration of capsule integrity. Afterwards, the patient was placed in the left lateral decubitus position, and a total of four port incisions were made in the right hemithorax, three for robotic arms and one for the assistant surgeon (Figure 2). Robotic arms were installed. On exploration, a mass approximately 4 cm in diameter with a paravertebral location was detected at the T8 level (Figure 3). The mass was completely excised (Figure 4). Total operation time was 280 minutes, and the total blood loss was 100 ml in both surgery. The patient was mobilized immediately after the operation. After an uneventful postoperative period the patient was discharged two days after surgery.

In the histopathological examination, the mass excised from the retroperitoneal region measured 2.5 × 2 × 2 cm and was evaluated as a schwannoma. Immunohistochemically, S-100 was positive and CD34 was negative. The intrathoracic excised mass measured 4.5 × 3.5 × 3 cm in diameters and was reported as a solitary fibrous tumor. Immunohistochemical examination of SFT revealed CD34 (+), EMA and S-100 (-). No recurrence was observed at the 3-years follow-up. Written informed consent was obtained from the patient for the publication of her data.

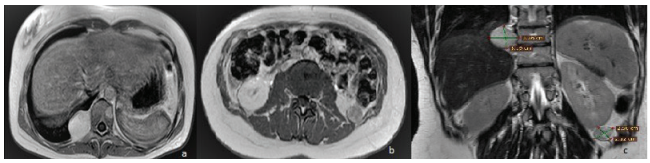

Figure 1. MRI scan of the lesions showing; intrathoracic mass **(a)**, retroperitoneal mass **(b)**, both masses **(c)**.

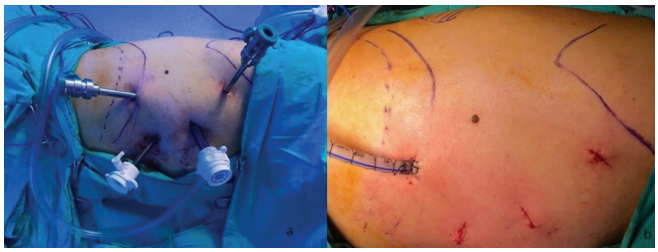

Figure 2. Placement of thorocars in robot-assisted thoracic Surgery **(a)**, postoperative view of port and drain locations **(b)**.

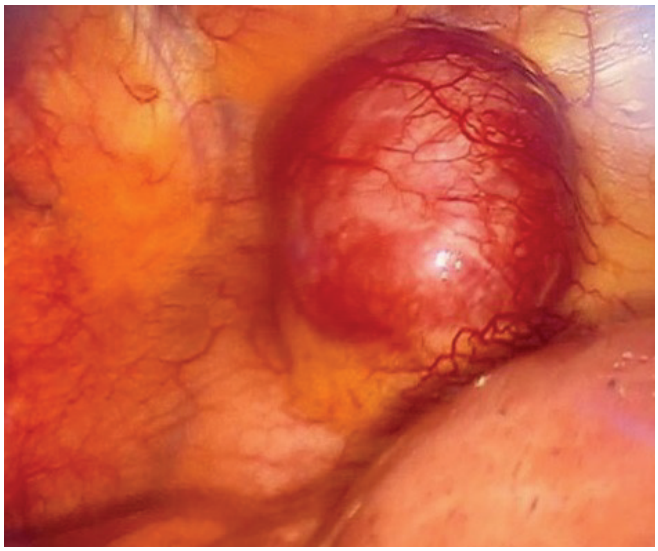

Figure 3. Intrathoracic view of the thoracic mass.

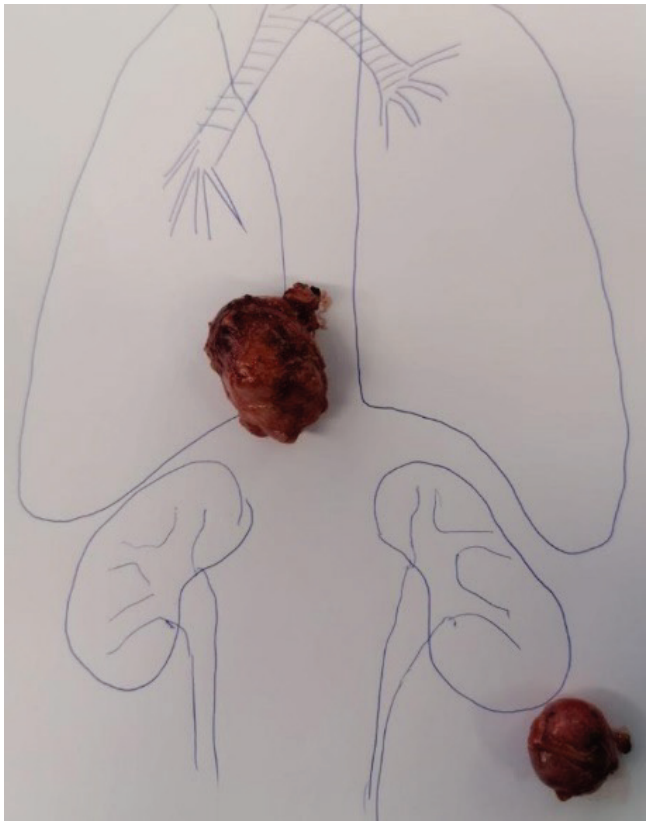

Figure 4. Schematic view of both masses.

Discussion

Solitary fibrous tumors generally appear as whitish, well-circumscribed and encapsulated lesion. In our case, the excised mass exactly corresponds to the macroscopic features that described in the literature. When it is located in the intrathoracic cavity, 80% of them originates from the visceral pleura. The mass we excised, on the other hand, arises from the parietal pleura, which is rare. In immunohistochemical evaluation of our case, CD34 was positive and S-100 was negative which supports that this lesion was benign because it is revealed that CD34 expression was negative approximately 90% of malignant SFTs [6].

In a review article including ten studies, the recurrence rate of benign solitary fibrous tumors was reported as 3% [7]. In our case, no recurrence was detected at three-year follow-up.

The minimally invasive approach has become the golden standard in many surgical branches, including thoracic surgery. Ghanim et al emphasized that video-assisted thoracic surgery (VATS) is the most commonly used minimally invasive technique in the treatment of small sized intrathoracic SFTs, compared to open surgery [8]. Robot-assisted surgery is also an important minimally invasive surgical technique. The advantages of this system are that it allows three-dimensional (3D) imaging, the surgeon's tremor is not reflected in the robotic arm movements, and simultaneously it provides more freedom of movement with multi-jointed robotic arms. Similar morbidity rates and length of hospitalization are observed by robot-assisted surgery compared to VATS in the resection of mediastinal tumors and cysts [9]. No complications were observed after robot-assisted surgery in our patient.

Schwannoma originating from Schwann cells of peripheral or cranial nerves is encountered in the retroperitoneal space in only 0.5% of cases [10]. The majority of patients are often asymptomatic or may present with nonspecific and vague symptoms, as in our case, and it is detected incidentally. It is difficult to make a definitive diagnosis in the preoperative period, especially due to it is rare occurrence in the retroperitoneal region. Macroscopically, retroperitoneal schwannomas are encapsulated and well-circumscribed tumors. In this case, the excised material was also encapsulated, shiny in appearance and orange in color on sections. In the immunohistochemical examination, the generally accepted S-100 positivity was also detected in our case.

The prognosis of schwannomas excised from the retroperitoneal region is generally satisfactory and recurrence is seen in 5-10% of patients probably due to inadequate excision [11]. In our case, no recurrence was observed during the 3-years follow-up period.

Robot-assisted surgery allows easier dissection, vessel ligation and suturing when compared to laparoscopic surgery. Consequently, a significant reduction in the intraoperative blood loss was observed with the robotic approach in dissection of deep tissues such as the retroperitoneal region. We did not encounter any bleeding after the simultaneous surgery we performed. As reported in some studies, the most important disadvantages of robotic surgery are longer mean operation time and higher cost compared to laparoscopy [12].

Despite the widespread use of robot-assisted surgery, especially in recent years, and oncological surgeries being increasingly performed with this technique, we have not encountered a case of simultaneous excision of intrathoracic and retroperitoneal masses with this technique in the literature. Principally, in these cases, two-stage surgery (the first treatment is for the more aggressive lesion) is performed as a treatment plan. The advantage of treating two neoplasms simultaneously is to avoid delaying treatment of the second tumor, especially in young patients. Possible problems can be listed when the treatment is performed in two stages include delay in excision of other masses due to waiting for the postoperative healing phase after the first surgery and intermittent anesthesia. This results, in turn, leads to an increase in cost and in the duration of hospitalization.

In conclusion, simultaneous minimally invasive surgery for small masses in the posterior mediastinum and retroperitoneal region may be appropriate in selected patients. Robotic-assisted surgery can be an alternative minimally invasive technique to VATS because of its technical superiorities. The only disadvantage of both robotic assisted surgery and simultaneous operation is prolonged operation time.

Declaration of conficting interests

The authors declared no conficts of interest with respect to the authorship and/or publication of this article.

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Authors' contributions

SM;TÇ;ÖS;ÖÇ;MŞ: conceived and designed the current case report, co-wrote the paper, collected the clinical data. The authors discussed the case under the literature data together and constituted the final manuscript.

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