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Anterior mediastinal solitary fibrous tumor resection by da Vinci[®] Surgical System in obese patient



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ABSTRACT

INTRODUCTION: Solitary fibrous tumors are uncommon soft tissue tumors initially reported only in the pleura but, in recent years, they have been described at many extra pleural sites, such as mediastinum. The treatment of choice is the extensive surgical resection that is curative for most benign lesions.

PRESENTATION OF THE CASE: We present the case of solitary fibrous tumor of the anterior mediastinum in obese patient (BMI: 34.3) undergoing complete surgical resection by robotic-assisted thoracoscopic surgery with da Vinci[®] Surgical System.

DISCUSSION/CONCLUSION: Robotic-assisted thoracoscopic surgery with da Vinci[®] Surgical System is an interesting option for obese patient, at higher risk for deep sternal wound infection.

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1. Introduction

Solitary fibrous tumors are uncommon soft tissue tumors initially reported in the pleura [1]. They occurs predominately in the fifth or seventh decades of life with equal male-to-female ratio [2]. In recent years they have been described at many extrapleural sites, such as: mediastinum, pulmonary parenchyma, pelvic cavity and nasal cavity [3]. The frequency of mediastinal localization is approximately 1–8% [2]. Wide and complete surgical resection may be curative in most cases [4]. Various surgical approaches have been reported in the literature: median sternotomy, thoracotomy, video-assisted thoracoscopy [4,5].

We present a case of solitary fibrous tumor of the anterior mediastinum in obese patient (BMI: 34.3) undergoing complete surgical resection by robotic-assisted thoracoscopic surgery with da Vinci[®] Surgical System.

2. Case report

A 46 years-old man (BMI 34.3), with no significant past medical history but obesity, was referred to our hospital because of a chest

radiography reporting an asymptomatic opacity incidentally discovered. Computed tomography (CT) showed a left heterogeneous mediastinal mass measuring 72 × 66 mm in its axial dimension with a craniocaudal extension of 100 mm. It was not possible to identify a clear cleavage plane with the pericardium (Fig. 1).

A next magnetic resonance imaging (MRI) reported no signs of infiltration of the left heart chambers. At first CT-guided transcutaneous aspiration biopsies were performed, but no diagnosis was obtained because of the insufficient or not significant samples. To get a definitive diagnosis, a minimally invasive approach by da Vinci[®] Surgical System was planned in order to perform a incisional biopsy in direct view.

Patient underwent pre-operative routinely test: Forced Vital Capacity (FVC) 114%, Forced Expiratory Volume 1s (FEV1) 118%, Diffusing Lung Capacity for CO (DLCO) 85%. No history of cardiologic dysfunction, angina or dyspnea. Blood samples and gas analysis reported no significant alterations.

The procedure was performed under total intravenous anesthesia (target controlled infusion) with propofol and remifentanyl. A 41Fr double-lumen tube was placed to get one lung ventilation. Intraoperative monitoring was continuous ECG, arterial blood pressure, Masimo[™] pulseoxymetry, bispectral index and TOF-CUFF[™]. Before surgical incision, an ultrasound guided paravertebral block was performed.

The patient was placed in supine position. The left hemithorax then was elevated with a long gel roll placed from the patient's hip to the tip of the scapula. Surgical approach was with three-port access. First port placed at the left sixth intercostal space in the anterior axillary line: the thoracoscope was introduced into

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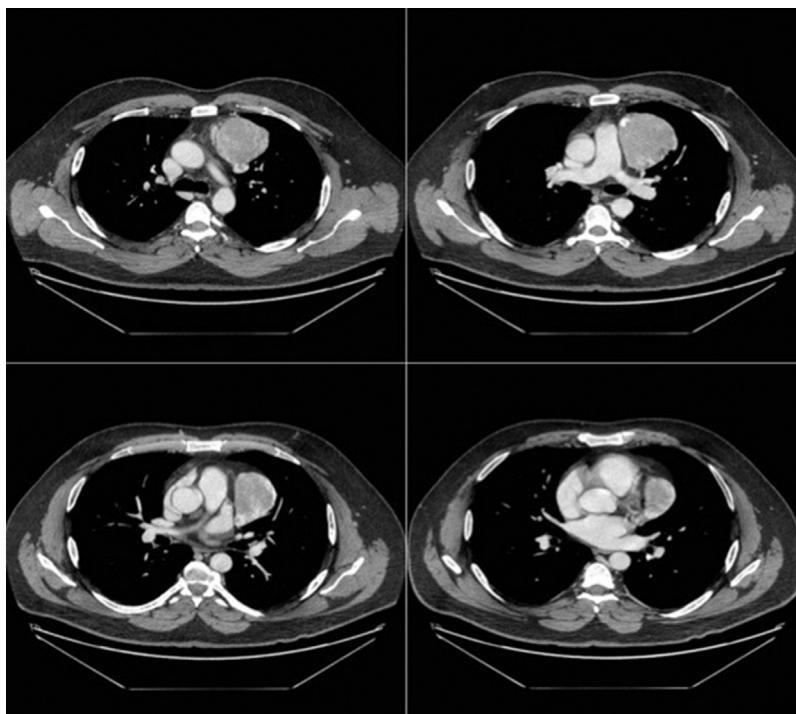


Fig. 1. Contrast-enhanced computed tomography scan shows a left heterogeneous mediastinal mass.

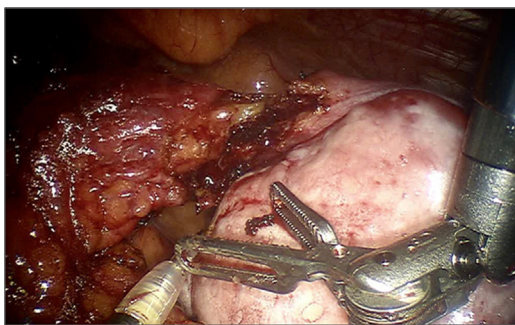


Fig. 2. Mediastinal mass and surrounding mediastinal fat undergoing resection by da Vinci® Surgical System.

the chest through it in order to explore the pleural cavity. Under thoracoscopic view two other port were placed, at the left third intercostal space in the anterior axillary line and at the left sixth intercostal space in the mid-clavicular line: through them were introduced in the chest the cautery spatula and a Cadieere clamp connected to the robot's arms. During the procedure insufflation of pleural space with carbon dioxide (CO₂) at a flow of 6–10 L/m until getting a pressure of 6–8 mmHg was applied to increase the size of the mediastinal space.

Inspecting the mediastinal mass before biopsy, was noticeable its well-circumscribed nature, with no invasion of vital neurovascular structures. Therefore surgeons performed a complete surgical resection by robotic-assisted thoracoscopic surgery with da Vinci® Surgical System (Fig. 2).

Mediastinal mass was completely resected with surrounding mediastinal fat. For the large size of the mass, an extension of one of three access incision for specimen removal by endobag was performed. After control of bleeding with electric coagulation, a 20-Fr chest tube was placed through the access performed at the sixth intercostal space in the mid-clavicular line (Fig. 3).

Once removed, the mass measured 100 × 60 × 80 mm and was firm with a white-grayish, lobulated cut surface.



Fig. 3. Three-port access with extension of the access performed at sixth intercostal space in the anterior axillary line for large size specimen removal.

At the end of surgery patient awake and was moved to post anesthesia care unit for short term observation. The patient made an uneventful recovery and was discharged on the fifth post-operative day. During patient stay a particular attention was given to glycemic control, although no correction was needed even after patient started to eat our hospital diabetic meal plan. At twelve months of follow-up, patient was asymptomatic and free of recurrence disease.

The microscopic examination revealed a spindle cells hypercellular proliferation arranged in short fascicles with storiform pattern. The spindle cell proliferation was cytologically banal with no significant mitotic count or necrosis. There was a prominent vascularity with variably thin- and thick-walled blood vessels. Immunohistochemically the cells were strongly positive for CD34,

vimentin and STAT6; negative for cytokeratine 8/18, desmin, CD99 and HMBE1. Proliferation index, valuated with Ki67, was 20%. These data were diagnostic for solitary fibrous tumor.

3. Comment

Solitary fibrous tumors of the mediastinum are rare neoplasms and may be discovered incidentally in asymptomatic patient [4]. Benign forms of the tumor are three to four times more common than the malignant forms even if the behaviour of a solitary fibrous tumor is unpredictable and the relationship between morphology and outcome is poor [2].

A long follow-up is mandatory. Some Authors report cases of local recurrence, metastases and disease progression [6]. Pathological criteria of malignancy include large tumors size (more than 5 cm), infiltrative margins, high cellularity, nuclear pleomorphism and tissue necrosis but the more reliable indicator of aggressive behaviour is an mitotic index more than 4 mitoses in 10 high power fields [4].

The treatment of choice for the solitary fibrous tumors of the mediastinum is extensive surgical resection. Surgical excision is curative for most benign lesions [2]. Robotic-assisted thoracoscopic surgery with da Vinci[®] Surgical System is an interesting option for obese patient, who are known to be at higher risk for deep sternal wound infection. Some Authors recommend minimally invasive surgery in the presence of mediastinal lesion <5 cm, while others accept also greater size [5].

We think that a careful technique associated to the surrounding mediastinal fat grasping too, can avoid a direct manipulation of the tumor and capsular damage. Robotic-assisted surgery allows shorter post-operative hospital stay, lower peri-operative complications and better cosmetic results than trans-sternal approach [7]. Compared with conventional thoracoscopy it allows more precise dissection around vascular and nervous structures ensuring a better view of the operative field with less risk of incomplete resection [8]. To our knowledge this is the first case reported in literature of solitary fibrous tumor of the anterior mediastinum undergoing complete surgical resection by robotic-assisted thoracoscopic surgery in obese patient.

Conflicts of interest

There is no conflict of interest for any of the authors.

Sources of funding

No additional found was provided for this study, all the research has been made in public hospital settings.

Ethical approval

Our hospital ethics committee didn't require to be informed when clinical management has nothing experimental but follows strict clinical routine.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Authors contribution

Dario Amore; study concept and data collection.
 Marco Rispoli; writing the paper.
 Marcellino Cicalese; data analysis.
 Ilaria De Rosa; data analysis.
 Giuseppe Rossi; data collection.
 Antonio Corcione; data analysis.
 Salvatore Buono; data analysis.
 Carlo Curcio; study concept.

Guarantor

Dario Amore, MD.

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