

Anterior bronchogenic mediastinal cyst as priority procedure for robotic thoracic surgery

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Abstract: We report a case of anterior bronchogenic mediastinal cyst (ABMC) in old age patient underwent Robotic Thoracic Surgery (da Vinci Surgical System). Video-assisted thoracoscopic surgery (VATS) represents the routine approach in posterior bronchogenic mediastinal cyst, but some limitation for resection of mediastinal mass located in the anterior mediastinum has been reported. The introduction of da Vinci surgical system has overcome the surgical limits of VATS as two dimensional vision (2D) and the use of long rigid instruments with poor maneuverability in case of fine dissection.

Keywords: Bronchogenic mediastinal cyst (BMC); robotic thoracic surgery; video-assisted thoracoscopic surgery (VATS)

Submitted Apr 16, 2017. Accepted for publication Jun 18, 2017.

doi: 10.21037/jtd.2017.07.39

View this article at: <http://dx.doi.org/10.21037/jtd.2017.07.39>

Introduction

Bronchogenic mediastinal cysts (BMC) are congenital lesions located usually in the middle or posterior areas of the mediastinum (1). They are seldom seen in the adult, often BMC are asymptomatic and encountered incidentally during routine chest roentgram for other reasons. The water-attenuation and soft-tissue-attenuation represent two different radiologic pattern of bronchogenic cysts (1). In case of soft-tissue bronchogenic cyst on CT scan, an accurate differential diagnosis from solid lesions can be problematic. Surgical excision is definitely diagnostic and therapeutic (2). The introduction of da Vinci surgical system has overcome the surgical limits of video-assisted thoracoscopic surgery (VATS) as two dimensional vision (2D) with lack of deep perception and the use of long rigid instruments with poor maneuverability in case of fine dissection (3). This latter drawback makes the VATS difficult to adopt in surgery of the mediastinum (3,4).

We report the complete resection by robotic-assisted thoracoscopic surgery of soft-tissue bronchogenic cyst located in the anterior mediastinum.

Case presentation

A 66-year-old male was referred to our hospital revealing asymptomatic round, well-circumscribed mass into antero-superior mediastinum on chest CT scan. The contrast enhanced chest CT scan showed a homogeneous soft tissue mass without mural enhancement or peripheral punctuate calcification (*Figure 1A*).

In order to establish diagnosis, complete surgical resection by robotic-assisted thoracoscopic surgery was performed. The procedure was performed under general anesthesia with single-lung ventilation.

The patient was placed in supine position. The left hemithorax was then elevated with a long gel roll placed from the patient's hip to the level of the tip of the scapula. Three-port access with insufflation of pleural space (CO₂ at flow of 6–10 L/m and pressures of 6–8 mmHg) was performed. After inspection of the thoracic cavity bronchogenic mediastinal cyst was completely resected with surrounding mediastinal fat (*Figure 1B,C*). The specimen was retrieved and a 20-Fr chest tube placed at the level of one of the incision wounds. The operative time was of



Figure 1 Computed tomography scan showing a soft-tissue attenuation mass in the anterior mediastinum. The anterior mediastinal cyst underwent surgical excision with surrounding mediastinal fat using the “da Vinci robot system”.

75 min and fine dissection of the cyst was performed in absence of any bleeding or harm to the adjacent tissues. The postoperative course was uneventful and no recurrence has been observed until now. Histologic examination showed a cyst filled with viscid and turbid fluid formed by ciliated columnar epithelial, hyaline cartilage and smooth muscle (*Figure 2*).

Discussion

Bronchogenic cysts are congenital lesions derived from abnormal budding of the embryonic foregut. The mediastinum or lung location of bronchogenic cysts, is related to time of separation from the tracheobronchial tree. The bronchogenic cysts are usually asymptomatic and often diagnosed incidentally during routine chest roentgenogram for other reasons. The clinical symptoms are related to the area of occurrence and chest pain, cough, dysphagia, dyspnoea or hemoptysis can be observed (1,5). The treatment options depend on the patients' age and symptoms at presentation (2). If in young patients, the surgical resection of cysts is the only treatment of choice, in asymptomatic adult patients remains controversial owing to the unpredictability complications or degeneration.

Conservative treatment can be advocated in asymptomatic adult patients with water-attenuation or in high risk patients, conversely in presence of soft-tissue mass, a complete excision results not questionable when CT or MRI are inconclusive (2,6).

In the last two decades, the robotic surgery changed the standard of mediastinum surgery. Although VATS gives clear benefits reducing the high morbidity and post-operative stay than open surgery, this minimally invasive technique presents some limitations that dissuade the use for the lesions located in the anterior mediastinum (3,4). The introduction of da Vinci surgical system has overcome the surgical limits of VATS. The three-dimensional (3D) vision and the endowrist technology improved vision of the operative field and reduced hand tremors from surgeon allowing greater technical precision (7,8). In particular the use of articulating instruments allowed to operate in limited and finite area so as anterior mediastinum with fine dissection around organs, vessel and corner when compared with VATS. Unlike a plethora results on the efficacy of robotic surgery for mediastinal diseases, sporadic cases on the robotic surgical excision of anterior bronchogenic mediastinal cyst (ABMC) have been reported in literature.

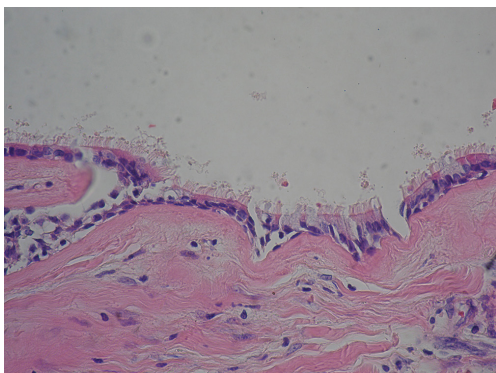


Figure 2 Microscopy showing bronchogenic cyst with ciliated columnar epithelial underlying connective tissue stroma (HE, $\times 200$).

A case report with excellent outcome was showed by Xu *et al.* (9). Despite Xu *et al.*, we report asymptomatic elderly patient with unusual soft-tissue mass into anterior mediastinum underwent robotic surgical system for definitive ABMC diagnoses.

The choice of Robotic surgical treatment for ABMC was not related to clinical symptoms but to prevent the risk of unpredictability complications or degeneration. To best of our knowledge, this is the first case report of its kind from the European country and confirms the superiority of robotic surgery than VATS as mini-invasive approach for anterior mediastinal mass.

Conclusions

Robotic-assisted thoracoscopic surgery is an available procedure for resecting soft-tissue bronchogenic cyst located in the anterior mediastinum. More experience should be confirmed our results.

Acknowledgements

None

Cite this article as: Caterino U, Amore D, Cicalese M, Curcio C. Anterior bronchogenic mediastinal cyst as priority procedure for robotic thoracic surgery. *J Thorac Dis* 2017;9(8):E674-E676. doi: 10.21037/jtd.2017.07.39

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 case report and any accompanying images.

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