Bilateral video-assisted thoracic surgery as an approach for descending necrotizing mediastinitis: a case report

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Background: Descending necrotizing mediastinitis (DNM) is a potentially lethal clinical entity characterized by the spread of a usually odontogenic or oropharyngeal infection to the mediastinum through the cervical fascial anatomical planes. Different surgical approaches have been established depending on the affected anatomical extent, classically, posterolateral thoracotomy has been described as the standard approach.

Case Description: We present the clinical case of a 37-year-old patient, with no relevant medical history, diagnosed with left submaxillary odontogenic phlegmon that continued along the deep cervical fascial planes with anterior and posterior mediastinum, as well as prominent bilateral loculated pleural effusions in relation to bilateral empyema compatible with DNM. Given these findings, empirical intravenous antibiotic treatment was established and cervical debridement was performed through a transcervical approach with a tracheostomy to secure the airway. A bilateral biportal video-assisted thoracic surgery (VATS) in the same surgical procedure was performed, which allowed anterior and posterior inferior surgical debridement of the mediastinum achieving a less traumatic approach. The clinical and radiological evolution was favorable after targeted antibiotic and antifungal treatment and after the introduction of intrapleural urokinase cycles in the right thoracic cavity.

Conclusions: In our experience, this approach, versus more aggressive initial approaches, is of enormous value in those patients who require a bilateral thoracic exploration due to involvement of both pleural cavities, allowing ideal access to all mediastinal compartments.

Keywords: Mediastinitis; oropharyngeal infection; video-assisted thoracic surgery (VATS); case report

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Introduction

Descending necrotizing mediastinitis (DNM) is a potentially lethal clinical entity characterized by the spread of a usually odontogenic or oropharyngeal infection to the mediastinum through the cervical fascial anatomical planes. The early introduction of broad-spectrum intravenous antibiotic therapy with an adequate management of the airway and the early intervention on the initial focus with an optimal debridement of the neck and/or mediastinum are the treatment of choice (1). We present the following case in accordance with the CARE reporting checklist (available at https://asj.amegroups.com/article/view/10.21037/asj-21-102/rc).

Case presentation

We present a clinical case of a 37-year-old patient, with no

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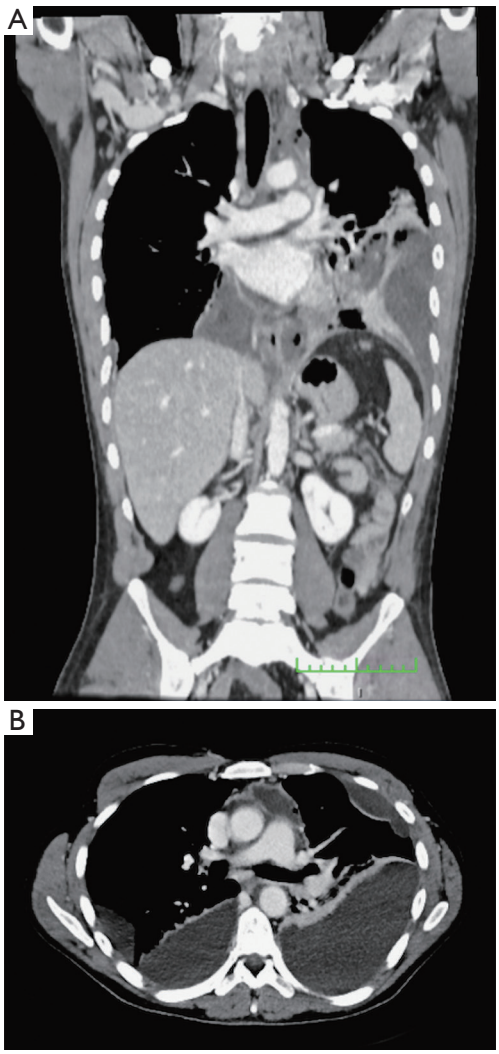

Figure 1 Computed tomography (CT). (A) Coronal plane; (B) axial plane.

relevant medical history, diagnosed with left submaxillary odontogenic phlegmon, who after the introduction of antibiotic treatment underwent surgery by means of extraction of piece No. 38 and submaxillary drainage, proceeding to hospital discharge after good clinical evolution. The patient debuted at 7 days with a worsening general condition, fever, bilateral chest pain with pleuritic characteristics, and progressive dyspnea on minimal effort. A cervical-thoracic computed tomography scan (CT) was performed (*Figure 1A,1B*) in which abscessed phlegmonous collections were described at the level of the floor of the mouth and the left submaxillary space, which continued through the deep cervical fascial planes with anterior and posterior mediastinum, with mural enhancements and hydroaerial levels, as well as prominent bilateral pleural effusions, loculated with thickening of its walls in relation to bilateral empyema compatible with DNM (Endo Type III).

Given these findings, empirical intravenous antibiotic treatment was established and cervical debridement was performed using a transcervical approach with a tracheostomy to secure the airway and a bilateral biportal video-assisted thoracic surgery (VATS), a left approach was performed first, with anterior and posterior mediastinal debridement, opening of para-aortic mediastinal pleura, evacuation of empyema and decortication. In the same surgical procedure, immediately afterwards, the right VATS was performed, evacuating the pleural collection, and completing the anterior and posterior mediastinal debridement, opening the paratracheal space.

In the immediate postoperative period, during his stay in the critical care unit, the patient presented septic shock and episodes of paroxysmal atrial fibrillation. *Candida lusitania*, *Candida albicans* and *Prevotella intermedia* were isolated in the microbiological cultures of the samples of pus from the pleural abscesses. The clinical and radiological evolution was favorable after targeted antibiotic and antifungal treatment and after the introduction of intrapleural urokinase cycles in the right thoracic cavity. The patient was discharged from hospital at 32 days. He was readmitted two weeks later due to a low-grade fever and evidence on a baseline encapsulated collection CT scan in the right hemithorax, which was treated conservatively by placing a 12-French ultrasound-guided chest tube drainage (CTD) and proceeding to discharge after completing clinical and radiological resolution 21 days after the hospital admission.

All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee and with the Helsinki Declaration (as revised in 2013). 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 editorial office of this journal.

Discussion

Once the clinical entity is recognized, it should be treated as a surgical emergency, inasmuch as the delay in the establishment of surgical treatment and insufficient

debridement are described as important mortality factors (1).

The initial symptoms of patients with DNM are described as vague and nonspecific, the identification of chest pain and respiratory distress are determining symptoms when mediastinal involvement is suspected (2). The imaging test considered of choice for diagnostic confirmation and the extension of the disease is CT (3).

Consequently, different surgical approaches have been established depending on the affected anatomical extent, generally, recommending a transcervical and transthoracic approach in those patients with mediastinal involvement inferior to the carina.

Regarding the transthoracic approach, posterolateral thoracotomy has been classically described as the standard approach compared to the median sternotomy or the clamshell incision, with the latter, as well as bilateral thoracotomy, being relegated to the advanced stages of type IIB or III mediastinitis (1,4,5). In the last decade, minimally invasive techniques have been consolidated in some centers as the approach of choice over posterolateral thoracotomy; VATS, by means of the complete visualization of the thoracic cavity, has allowed surgical debridement in mediastinitis with both anterior and posterior inferior involvement, achieving a less traumatic approach, with a lower risk of osteomyelitis and with a better clinical tolerance to the repetition of the drainage process (6,7). To our knowledge, this is one of the limited cases described in the literature of DNM treated with bilateral VATS in the same surgical act. In our experience, this approach is of enormous value in those patients who require a bilateral thoracic exploration due to involvement of both pleural cavities, allowing ideal access to all mediastinal compartments.

In conclusion, we recommend the initial consideration of a surgical approach using bilateral VATS in those patients who present bilateral anterior and posterior inferior mediastinal involvement (Endo type III) versus more aggressive initial approaches.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at https://asj.amegroups.com/article/view/10.21037/asj-21-102/rc

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://asj.amegroups.com/article/view/10.21037/asj-21-102/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). 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 editorial office of this journal.

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