PULMONARY PUZZLE

Man with chest wall mass and hypotension

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Received 16 March 2020
Revised 18 April 2020
Accepted 21 April 2020
Published Online First
14 May 2020

To cite: Guan C-Y, Ho C-H, Huang Y-J, *et al*. *Thorax* 2020;**75**:702–703.

CASE PRESENTATION

A 59-year-old man with a history of encephalopathy in bedridden state since childhood presented to our hospital with a left-sided enlarging chest wall mass of a 2-month duration. On physical examination, his vital signs were as follows: temperature, 35.8°C; pulse rate, 54/min; respiratory rate, 28/min; and blood pressure, 79/39 mm Hg. He displayed a tender, erythematous, fluctuant mass (9×8 cm) over the left anterior chest (figure 1A) and tenderness in the left upper quadrant. Moreover, poor dentition was noted. The laboratory studies showed leucocytosis (17.5×10^9/L) with predominant neutrophil count (88%) and elevated C-reactive protein level (164.8 mg/L). Chest radiography revealed an opacification extending from left lower lung field to left subphrenic region and blurred left costophrenic angle (figure 1B). Ultrasonography of the chest wall mass presented fluid collections with the communication between the chest wall and the pleural cavity (figure 1C). Sagittal contrast-enhanced CT showed pleural effusion with extension into the chest wall and dissection of pleural fluid through the diaphragm into the extraperitoneal space (figure 1D).

QUESTION

What is the diagnosis?

ANSWER

The patient immediately underwent chest tube thoracostomy with drainage of malodorous, purulent pus and subsequent collapse of the anterior chest mass. The culture of purulent pus yielded *Fusobacterium nucleatum*. He was found to have *F. nucleatum* empyema necessitatis with dissection into the extraperitoneal space and complicated by septic shock.

Empyema necessitatis is characterised by an extension of empyema thoracis from the pleural space to the soft tissues of the chest wall.[1] It usually occurs due to untreated or undertreated parapneumonic effusion. Patients typically present with a subacute painful erythematous mass on the thoracic wall. *F. nucleatum* is an anaerobic oral commensal and a periodontal pathogen that plays a role in anaerobic pleural infection.[2 3] Pleuropulmonary infection caused by *F. nucleatum* is usually due to the oropharyngeal aspiration in patients with periodontal disease.[4] In the present case, the patient had encephalopathy-related oropharyngeal dysphagia and poor dentition with chronic periodontitis, which increased the risk of aspiration pneumonia secondary to the anaerobic organism such as *F. nucleatum* and subsequently contributed to the empyema necessitatis.

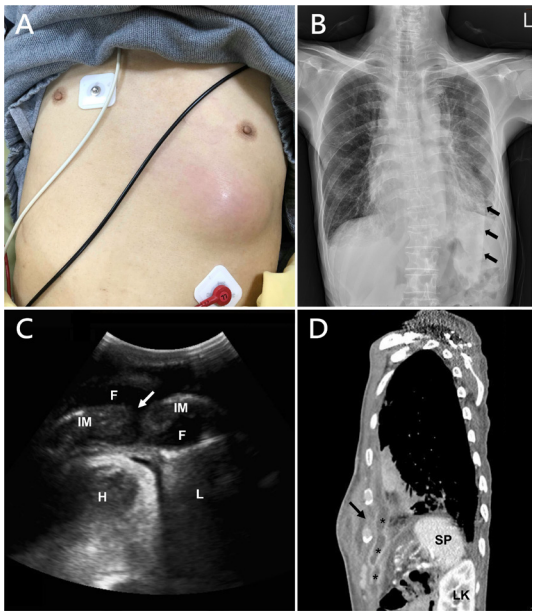

Figure 1 Imaging approach of the chest wall lesion. (A) A bulging mass (9×8 cm) with tenderness and erythematous change over left anterior chest. (B) Chest radiography showed an opacity over left lower lung field with extension to left subdiaphragmatic region (arrows). (C) Ultrasonography of the chest wall mass revealed fluid collections and a pleurocutaneous fistula between chest wall and pleural space. (D) Sagittal views of contrast-enhanced chest CT demonstrated a pleural fluid (asterisk) with extension to chest wall through the defect (arrow) and dissecting into the extraperitoneal space. F, fluid; H, heart; IM, intercostal muscle; L, lung; LK, left kidney; SP, spleen.

Chest radiograph showed the opacification extending from the level of chest wall mass to the subphrenic region, suggesting the chest wall lesion with extrathoracic compartment involvement (figure 1B). Ultrasound is a rapid and timely imaging tool for the differentiation of solid from cystic masses. The identification of fluid collections in superficial chest wall and pleural space with similar echo pattern and the pleurocutaneous fistulas confirms the diagnosis of empyema necessitatis (figure 1C).[5] Chest CT scan is the most sensitive technique to detect empyema necessitatis and characterises the extent of chest wall and adjacent structure invasion (figure 1D).[6]

This case demonstrates that normal flora of the oral cavity such as *F. nucleatum* can become invasive when it reaches pleural space through microaspiration and capable of causing empyema necessitatis with extraperitoneal space involvement and septic shock. Early diagnosis and prompt intervention of empyema necessitatis are crucial for preventing its potential fatalities and other dismal outcomes.

Acknowledgements The authors thank Berthony Deslouches for his helpful comments and suggestions.

Contributors C-YG and C-HL wrote the manuscript. Y-JH and Y-YC treated the patient. C-HH and H-HW performed and interpreted imaging studies.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article.

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