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Spontaneous hemopneumothorax in an adolescent with COVID-19

A.B. Montgomery a, b, C. Finck a, b, *

a Department of Pediatrics and Surgery, University of Connecticut School of Medicine, 263 Farmington Avenue, Farmington, CT, 06030, USA
b Connecticut Children’s Department of Pediatric Surgery, 282 Washington Street, Hartford, CT, 06106, USA

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ABSTRACT

As coronavirus disease 2019 (Covid-19) continues to spread world-wide, new symptoms associated with the disease continue to appear. Common manifestations include fever, shortness of breath, and gastrointestinal illness. In addition, COVID is known to induce coagulopathy. Here, we present the case of a 17-year-old male who presented with a massive hemopneumothorax and was found to incidentally be positive for Covid-19. We suspect that he had a primary pneumothorax from a bleb and the hemothorax could’ve been induced by the coagulopathic state induced by COVID infection.

1. Background

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) continues to fuel an international pandemic since its discovery in Wuhan, China in December 2019 [1]. Through its various forms of presentation, ranging from asymptomatic to multi-organ system failure, Covid-19 pathophysiology remains elusive. While children who contract Covid-19 exhibit mild symptoms, potential life-threatening complications secondary to infection should not be ignored. Spontaneous hemopneumothorax (SHP) is a rare condition in pediatrics (<1% of cases) that is confirmed by an accumulation of air and blood (>400mL) in the pleural cavity [2]. This rare finding mainly affects males more than females (4:1) and can be life-threatening if overlooked. Recently, physicians suggest that Covid-19 infection induces coagulopathy [3]. Here, we present the first case of the successful management of a massive SHP in an adolescent incidentally found to be positive for Covid-19.

2. Case report

A 17-year-old male, with no past medical or surgical history, presented to the emergency department complaining of left chest pain and dyspnea that began 1 day prior to admission. The patient denied any recent trauma and didn’t have any fevers, cough or GI symptoms. Initial chest x-ray revealed a left-sided pneumothorax with accompanying pleural effusion, suggesting hemopneumothorax (Fig. 1). Preoperative PCR Covid-19 test results were positive. A pigtail chest tube was placed under local anesthetic using appropriate personal protective equipment with return of ~400 cc of blood. The initial post op CXR showed resolution of hemopneumothorax. Several hours later, the patient became hypotensive and tachycardic with left-sided diminished breath sounds. Repeat CXR revealed a large left-sided hemopneumothorax (Fig. 2A) and a decrease in hemoglobin from 9.7 to 8.0. The patient received immediate blood transfusion and chest CT angiography showed a large hemopneumothorax with mediastinal shift but no active extravasation of contrast (Fig. 3). The patient underwent left VATS with washout and chest tube placement. A bleb was identified and resected. There was nothing found to be actively bleeding. The patient progressed well postoperatively and was discharged on POD 4 (Fig. 2B).

3. Discussion

Pathophysiology of SARS-CoV-2 remains elusive and continues to present itself in many different forms. Thus far, children <18 represent approximately one-fifth of diagnosed Covid-19 cases in the United States [1] and often present with mild symptoms, however, more severe complications such as SHP should be taken into consideration. Few reports have described Covid-19 in SHP development in adults [4-6]. Our case report is the first to describe the successful management of SHP secondary to Covid-19 infection in an adolescent. We suspect the patient had a rupture of a bleb causing a pneumothorax and the coagulopathy induced by COVID contributed to the hemothorax development. Further evaluation of cases as they present and establishment of best practices are important to understand the severe complications associated with Covid-19.

* Corresponding author. Connecticut Children’s Department of Pediatric Surgery, 282 Washington Street, Hartford, CT, 06106, USA.
E-mail address: cfinck@connecticutchildrens.org (C. Finck).

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Fig. 1. Initial CXR of left-sided pneumothorax.
4. Conclusion

Spontaneous hemopneumothorax is uncommon in pediatric patients and an even rarer side effect of Covid-19 infection. While most cases of adolescent patients presenting with Covid-19 have mild symptoms, acute complaints of dyspnea and chest pain could indicate SHP. Further studies are necessary to evaluate the relationship between Covid-19 pathophysiology and the onset of spontaneous life-threatening conditions such as SHP.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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