Spontaneous pneumomediastinum. A case report

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Case Report

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Abstract: The pneumomediastinum is an unusual complication of respiratory infections in immunocompromised patients and may be associated with opportunistic pneumonia.
We describe the case of a child with a medical history of acute lymphoblastic leukemia diagnosis, undergoing chemotherapy, and presenting a respiratory distress due to a pneumomediastinum. Etiological investigations identified a cytomegalovirus (CMV) pneumonia.
The spontaneous pneumomediastinum is a rare cause of respiratory distress in immunocompromised children.

Keywords: cytomegalovirus pneumonia, immunocompromised child, pneumomediastinum

Introduction

A pneumomediastinum refers to the presence of air in the mediastinum and it is usually a benign condition, occurring spontaneously in healthy young adults. It can also occur resultant to trauma, surgery or infection. [2]

Pneumopericardium is the presence of air in the pericardial space. It is an uncommon complication of blunt or penetrating chest trauma and can also occur iatrogenically or complicate an infection. [5]

The occurrence of a pneumomediastinum is a rare cause of a respiratory distress in immunocompromised children. Opportunistic infections can be one reason.

We describe the development of a pneumomediastinum and a pneumopericardium in an immunocompromised child, as a complication of a CMV pneumonia.

Case report

An 8-year-old female child, with a medical history of acute lymphoblastic leukemia diagnosis which was revealed by an anemic syndrome, an infectious syndrome with isolated fever, and without hemorrhagic or infiltrative syndrome. On October 2017, the child started going through chemotherapy sessions as according to the Marall HR protocol and was in its second year of maintenance. On June 13, 2020, our hospital service for neurological and hematological took her in charge for her leukemia-related neurological and hematologic signs. The medical examination on admission represented a conscious child with no sensory or motor deficit, polypneic at 32 cycles per minute with 100% SpO2 in the open air, a heart rate of 90 beats per minute, and blood pressure of 110/80 mmHg. She was apyretic at anemia as 8.5 g/dl, high CRP as 148.6 mg/l and slight hypokalemia as 3.3 mEq/l.

On the seventh day of her hospitalization, the patient presented a respiratory distress with polypnea and signs of struggle made of thoracoabdominal rocking, suprasternal pulling and flapping of the wings of the nose. Considering these clinical signs, we requested a thoracic CT scan (**Fig 1**). It showed the appearance of a pneumomediastinum of great abundance, it extended to the cervical stage with emphysema dissecting the left latero-thoracic soft tissues, and the presence of a pneumopericardium, without detectable pulmonary parenchymal nodule. The service transferred the patient to a pediatric intensive care unit for close observation and monitoring, sooner we detected a decrease of SpO2 to 80% in the open-air requiring intubation and mechanical ventilation. The child went through treatment: ciproxine, gentamicin, voriconazole, and cotrimoxazole.

At day 10 of her hospitalization, a control thoracic CT scan was performed showing bilateral ground glass opacities, a micronodular peribrochiolar infiltrate of the right upper lobe and the left lower lobe, a collapse of the ascending aorta, the persistence of the pneumomediastinum of low abundance and the disappearance of the pneumopericardium.

The evolution was marked by hemodynamic degradation with the development of hypotension at 50/30 mmHg for which norepinephrine was introduced at a dose of 0.2 ɣ/Kg/min. The patient died on the 12th day of her hospitalization.

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Figure 1. CT scan showing pneumomediastinum (arrow) and pneumopericardium (asterisk).

Discussion

CMV pneumonitis generally occurs in immunocompromised hosts, including organ transplant recipients and patients on chemotherapy or immunosuppressive therapy for autoimmune diseases. [1]

CMV infection is ubiquitous but is usually not clinically apparent. Interstitial pneumonia is a major cause of mortality and morbidity, and CMV is one of the most common pathogens associated with interstitial pneumonia. [4]

CMV pneumonia has been described as having a variety of radiographic appearances: bilateral interstitial linear or ground glass shadowing usually beginning in the periphery of the lower lobes and then slowly extending centrally and superiorly, diffuse bilateral air space shadowing, or less commonly, a unilateral focal area of air space shadowing. Rarely CMV may present as a solitary pulmonary nodule.
Spontaneous pneumomediastinum is detected in some patients, all of whom had bone marrow transplantation. [4]

A study at Harare hospital in Zimbabwe reported the case of an HIV-positive patient with pneumomediastinum on CMV pneumonia, initially treated as Pneumocystis Jirovecii infection. She was admitted with severe respiratory distress. Empirical therapy was started, on suspicion of Pneumocystis jirovecii pneumonia, with cotrimoxazole and prednisone. The evolution was marked by a slow improvement and then a degradation on the respiratory level, the radiography showed a pneumomediastinum, a subcutaneous emphysema and a right pneumothorax, the pulmonary histology showed inclusions revealing a CMV infection, and then a treatment with ganciclovir was started. [2]

In Zimbabwe, CMV infection is inferred from pathognomonic histological appearances. [2]
In our study, the diagnosis of CMV pneumonia was made after positive viral serology. The patient died before treatment was administered.

In another study, a retrospective analysis was conducted on 11 cases with spontaneous pneumomediastinum in HIV-positive patients. All of these 11 patients had bilateral pulmonary infiltrations. Ten of these cases were related to Pneumocystis jirovecii lung infection, and only one case of pneumomediastinum was related to CMV pneumonia. [3]

Conclusion

CMV pneumonia is a rare cause of respiratory distress in immunocompromised children.

Spontaneous pneumomediastinum are associated frequently with advanced CMV pneumonia. The radiological appearances of cytomegalovirus pneumonia varied widely with no pattern sufficiently characteristic to allow early differentiation of CMV from other infective agents.

Conflicts of interests

The authors have no conflicts of interest to declare

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