



An isolated spontaneous pneumomediastinum as a rare complication of COVID 19

Pneumo médiastin spontané isolé comme complication rare de la COVID-19

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RÉSUMÉ

La pandémie due au nouveau coronavirus (COVID-19) présente une hétérogénéité dans ces manifestations et ses complications. Ce cas clinique illustre un problème rare : le pneumo-médiastin spontané

Il s'agit d'un homme de 73 ans ayant présenté des frissons et des signes respiratoires aigus. Un test par la réaction en chaîne par polymérase en temps réel (RT-PCR) a confirmé l'atteinte au COVID-19. À l'admission, le malade était en détresse respiratoire aiguë. La protéine C réactive (CRP) était à 54 mg/l (norme 0-5mg/l), les troponines étaient négatives, le peptide natriurétique cérébral (BNP) était à 55 pg/ml (norme <100 pg/ml), et les D-Dimères étaient à 700 mcg/l (norme 0-500 mcg/l). Les gaz du sang artériels ont montré un PH à 7,49 (norme : 7,37-7,45), PCO₂ à 33,8 mmHg (norme 34-46 mmHg), et PO₂ à 56 mmHg (norme 80-97 mmHg), sous un débit d'oxygène de 16 litres par minutes. La tomographie thoracique (TDM thoracique) montrait des opacités en verre dépoli diffuses (60-70%) sans embolie pulmonaire. Le diagnostic de syndrome de détresse respiratoire aiguë était posé. Le malade était mis sous oxygène à faible pression (saturation en oxygène cible ≥ 94%), des doses intermédiaires d'héparine de bas poids moléculaire, et une dose journalière de 8mg de dexaméthasone. Une instabilité hémodynamique avec perturbation gazométrique ont marqué l'évolution. Une TDM thoracique montrait un pneumo médiastin bilatéral modéré, sans pneumothorax associé, avec persistance des opacités en verre dépoli (75%), et apparition des éléments de fibrose précoce. Le patient s'est rétabli sans séquelles pulmonaires.

Ce cas rapporté encourage les praticiens à s'habituer aux manifestations cliniques et radiologiques peu fréquentes de la COVID-19 qui surprend toujours le monde.

Mots clef : COVID-19, pneumomédiastin spontané, détresse respiratoire aiguë, complications de la COVID-19

SUMMARY

The Coronavirus Disease 2019 (COVID-19) pandemic has displayed heterogeneity in disease manifestations and complications. This case report illustrates a rare issue : the spontaneous pneumomediastinum.

A 73-year-old male presented with chills, and respiratory symptoms. A reverse transcriptase polymerase chain reaction (RT-PCR) test- confirmed COVID19. At admission, the patient was in severe respiratory distress. C reactive protein was 54 mg/l (normal: 0-5 mg/l), , troponin were negative, brain natriuretic peptid 55 pg/ml (normal range <100 pg/ml) and D-dimer 700 mcg/l (normal: 0-500 mcg/l). Arterial blood gases showed pH 7.49 (normal: 7.35-7.45), PCO₂ 33,8 mmHg (normal: 34-46 mmHg) and PO₂ 56 mmHg (normal: 80-97 mmHg) with 16 liter per minute of oxygen. Computed tomography of the chest (CT chest) showed diffuse groundglass opacities (60-70%) without pulmonary embolism. Diagnosis of acute respiratory distress syndrome (ARDS) was made. Low flow oxygen was provided (Oxygen saturation target ≥ 94%), intermediate dose of low molecular weight heparin and 8mg of dexamethason were administered daily. On day 10, worsening hemodynamics and blood oxygen levels was noted. CT chest showed moderate bilateral pneumomediastinum, without pneumothorax, persistent groundglass opacities (75%) with early fibrosis elements. The patient recovered with no pulmonary sequelae.

This case report encourages health workers to get used with infrequent clinical and radiological manifestations of COVID-19 that is still surprising the world.

Key words : COVID-19, spontaneous pneumomediastinum, acute respiratory distress, COVID-19 complications

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INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) pandemic has displayed heterogeneity in disease manifestations and complications; cardiac, renal, neurological complications and coagulopathy are reported. This case report illustrates infrequently reported complication of progressive COVID 19, spontaneous pneumomediastinum.

CASE PRESENTATION

A 73-year-old male with a past medical history of hypertension presented to the emergency room with chills, non productive cough, shortness of breath, and moderate chest pain. He was admitted in our department after a reverse transcriptase polymerase chain reaction (RT-PCR) test- confirmed COVID19. On initial evaluation, the patient was afebrile and hemodynamically stable. He was in severe respiratory distress with tachypnea and with a pulse oximetry reading of 76% breathing room air and of 91% on 15L/min supplemental oxygen by non-rebreather mask.

Laboratory investigation showed white blood cells of $12.3 \times 1000/\text{mm}^3$ (normal: $3.4-9.4 \times 1000/\text{mm}^3$) [differential: 82% (normal: 47-67%) neutrophils and 12% (normal: 25-45%) lymphocytes], C reactive protein 54 mg/l (normal: 0-5 mg/l), blood sugar 14 mmol/l, troponin were negative, brain natriuretic peptid 55 pg/ml (normal range <100 pg/ml) and D-dimer 700 mcg/l (normal: 0-500 mcg/l). Arterial blood gases showed pH 7.49 (normal: 7.35-7.45), PCO_2 33,8 mmHg (normal: 34-46 mmHg) and PO_2 56 mmHg (normal: 80-97 mmHg) with 16 liter per minute of oxygen. The patient's remaining blood work results including kidney and liver functions, the remainder of the comprehensive metabolic panel, lactate, and creatine phosphokinase were all within normal limits. Transthoracic echography did not show signs of congestion or pulmonary embolism. Computed tomography of the chest (CT chest) showed diffuse groundglass opacities (60-70%) without pulmonary embolism too. Diagnosis of acute respiratory distress syndrome (ARDS) was made. Neither invasive nor positive-pressure ventilation was necessary. Low flow oxygen was provided (Oxygen saturation target $\geq 94\%$), intermediate dose of low molecular weight heparin and 8mg of dexamethason were administered daily. On day 10, worsening hemodynamics and blood oxygen levels was noted. Ventral decubitus was not effective. CT chest

showed moderate bilateral pneumomediastinum, without pneumothorax, persistent groundglass opacities (75%) with early fibrosis elements (figure 1). The evolution was marked by an improvement and we decreased the oxygen flow gradually.

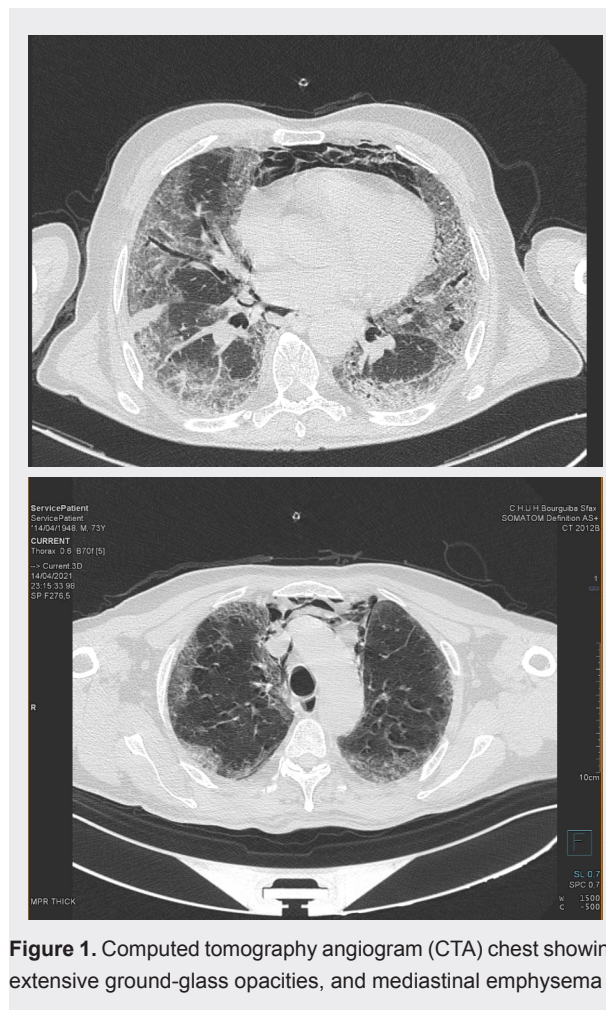


Figure 1. Computed tomography angiogram (CTA) chest showing extensive ground-glass opacities, and mediastinal emphysema

DISCUSSION

COVID-19 causes pulmonary involvement ranging from atypical pneumonia to ARDS. Few cases of COVID-19-associated pneumomediastinum are reported in the literature. Barotrauma from mechanical ventilation accounts for one third cases of pneumomediastinum [1]. Whereas, this case report highlights one infrequently noted complication of COVID-19 which is spontaneous pneumomediastinum [2-3]. « Macklin effect » that causes this complication includes blunt traumatic alveolar ruptures, air dissection along bronchovascular sheaths, and

spreading of this blunt pulmonary interstitial emphysema into the mediastinum [4-5-6]. The patient presented in this case probably had increased intrathoracic pressure caused by coughing because of heavy inflammatory burden. Alveolar walls were fragile due to diffuse alveolar cell damage from SARS-CoV-2, that infects alveolar type II cells [7]. All of this, may promote alveolar cystic rupture

Different mechanisms, such as anatomic abnormalities (ie, emphysematous bullae), genetical predisposition (ie, history of spontaneous pneumothorax), inflammatory-mediated lung stiffness (ie, COVID19-related pulmonary fibrosis) may play a role too. A spontaneous pneumothorax and sub cutaneous emphysema are possible complications of spontaneous pneumomediastinum with released alveolar air being trapped in the pleural cavity, but luckily, it was not the case in this report [4-7].

Moreover, the absence of pneumothorax and the moderate pneumomediastinum, which was particularly evident in this patient may be explained by the pneumonia-related lung stiffness that led to greater air expansion in the more compliant mediastinum [8]

COVID-19 causes pulmonary involvements with various prognosis, that depend on comorbidities, late or inadequate treatment, extension of the pulmonary damages and complications occurrence. Pneumomediastinum may reduce chances of survive. The issues are worse if it is related to barotrauma. Fortunately it was not the case of our patient.

CONCLUSION

The COVID-19 outbreak has resulted in a global health emergency. It is compulsory for health workers to get used with both typical symptoms and imaging results for COVID-19 as well as less commonly reported complications of progressive COVID-19, such as spontaneous pneumomediastinum documented in this case.

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