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Case Report

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Extrapulmonary Manifestation of COVID -19: A Surgical Emergency Dilemma

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Abstract

Pneumonia presenting with abdominal pain with no respiratory symptoms is rare in adults. A 68 years old woman presented with acute epigastric pain with no sign's symptoms of respiratory infection. Patient had Covid-19 infection (Category 2A) a month prior to this. Patient was treated initially as acute cholecystitis and intravenous antibiotics were started. However, a CT pulmonary angiograph was performed in view patient desaturated and collapsed. It showed bilateral pleural effusion with pulmonary embolism. A post-COVID pneumonia with pulmonary embolism was diagnosed.

In this new era of COVID-19 pandemic, it is important for us surgeons to consider lung pathology as a differential diagnosis in cases with epigastric or hypochondria pain, especially when other tell-tale sign do not pinpoint a specific abdominal pathology. We advocate for a baseline chest x-ray for all patients with past history of COVID-19 infection upon admission. We also suggest for a repeat chest x-ray on day three of admission if patients are not improving with initial management. In such scenario, it is best to seek for an expert reporting by a radiologist. A simple, cost-effective serial chest x-ray with a thorough reporting can save our patient's life.

Keywords: *Post-COVID pneumonia, Pulmonary embolism, Extrapulmonary Manifestation, Acute cholecystitis, chest x-ray.*

Introduction

Pneumonia is a well-known extra-abdominal cause presenting with abdominal pain in children [1]. Though the exact mechanism is not understood, some suggests its due to the irritation of diaphragm in lower zone pneumonia [2]. Retro-cardiac pneumonia is also known to present with abdominal pain as it irritates lower intercostal nerves of both lower costal pleura and intercostal nerves [3]. However, pneumonia rarely presents as abdominal pain in adults. A typical pneumonia is usually diagnosed with classical presentation of fever, productive cough, shortness of breath [4]. When any of the symptoms are not present, it is classified as atypical pneumonia. At such circumstances, radiological feature via chest X-ray is the key.

Post-sequalae of COVID-19 is still being studied and understood. Two of known sequalae are pneumonia and pulmonary embolism [5]. Covid-19 is known to cause parenchymal injuries hence predisposing it to secondary injuries resulting in pneumonia. The injuries usually take time to heal and may complicate in lung fibrosis. Post-COVID 19 pneumonia is also known as organising pneumonia. Patient usually presents with fever, chest pain, productive cough and shortness.

COVID-19 also predisposes to thrombo-embolism events. This risk is high not only during the infective period and persist post-infection. Patient usually presents with chest pain and breathing difficulties too. Pulmonary embolism may present with abdominal pain. Though mechanisms are unclear, it could be due to hepatic congestion, distension of Glisson's capsule, or even diaphragmatic irritation. With COVID-19 pandemic still on-going, in future a significant number of patients would have prior COVID infection. Therefore, it is essential to keep these sequalae as differentials when diagnosis is not clear cut.

Case presentation

A 68 years old woman presented to casualty department with a sharp pain over the epigastric region for two days duration. Patient denies of vomiting neither diarrhoea. On further history taking patient had Covid-19 infection (Category 2A) a month prior to this presentation. However, at current presentation there was no fever, cough or breathing difficulties. Upon examination, patient was pink, no jaundice, abdomen was soft but tender over epigastric and right hypochondrium region, Murphy sign was negative. Lungs the air entry was equal. Her blood investigations showed leucocytosis with pre-dominant neutrophils, while other parameters being unremarkable. Abdominal x-ray showed no abnormalities. Upon review of chest x-ray, there was no air under the diaphragm and no other obvious abnormalities was seen.We proceeded with ultrasound of the hepatobiliary system showed minimal perihepatic free fluid. Patient was treated as acute cholecystitis and was admitted to surgical ward. Intravenous antibiotics (cefoperazone and metronidazole) were started. However, patient's abdominal pain still persisted.

On Day 4 of admission, patient had a desaturation episode. Patient was intubated in view impending respiratory collapse. She was also hypotensive, hence intravenous inotrope support (IVI noradrenaline) was started. Her arterial blood gas analysis showed severe metabolic acidosis. Patient was suspected to be under septic shock due to intraabdominal sepsis. CT abdomen was done to rule out gangrenous gall bladder. While awaiting CT formal report, percutaneous cholecystomy was done whereby 75ml of thick bile was drained. However, there was no pus.

CT abdomen did not show any abdominal pathologies, instead it suggested active chest infection with bilateral pleural effusions and loculated pleural effusion on the left. It was then confirmed the patient was having septic shock secondary to post-covid bilateral bronchopneumonia with parapneumonic effusion. CT angiography of pulmonary arteries was also done with the suspicion of pulmonary embolism. It showed posterior segmental branch of right upper lobe pulmonary artery thrombus narrowing the airway. Case was taken over by medical team. Patient was treated for Post COVID -19 atypical pneumonia and right upper lobe posterior segmental pulmonary embolism. The pneumonia was classified as atypical because chest x-ray showed worsening consolidation despite patient was afebrile, CRP reading being static and blood and sputum culture showing no growth of organism. Cultures of bronchoalveolar lavage and pus from cholecystectomy showed no growth of organism as well. Repeated Polymerase Chain Reaction for COVID-19 was also negative. Patient passed away on Day 26 of admission due to progression of disease resulting in multiple organs failure.

Retrospectively, we decided to review the serial chest x-ray with our radiologist. The chest x-ray of current admission and during her previous admission of her COVID-19 infection were compared. The images and respective reports are as follow.

Images

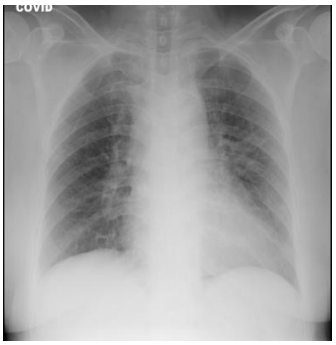

Image 1: Showed chest X-ray taken during first presentation of patient with COVID-19 infection

Reported as:

1. Right lower zone opacities
   Conclusion: COVID-19 positive with air space opacities at right lower zone

Image 2: Showed chest X-ray taken during discharge

Reported as:

1. Resolution of opacities in both lower zones

2. Residual left perihilar infiltrates

Conclusion: Resolution of chest infection with residual lungs changes

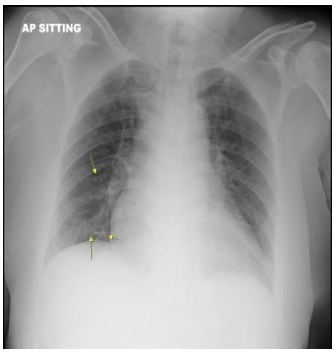

Image 3: Showed chest X-ray was taken during second presentation

Reported as:

1. Right lower and midzone ill-defined opacities

Conclusion: Features supportive of active chest infection

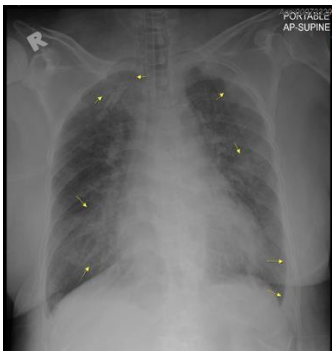

Image 4: Showed chest X-ray was taken following desaturation and intubation

Reported as:

1. Ill-defined opacities predominantly at right lower zones and scattered in both upper and left mid zones

2. Presence of left sided pleural effusion

Conclusion: Features supportive of active chest infection likely bronchopneumonia with left-sided pleural effusion

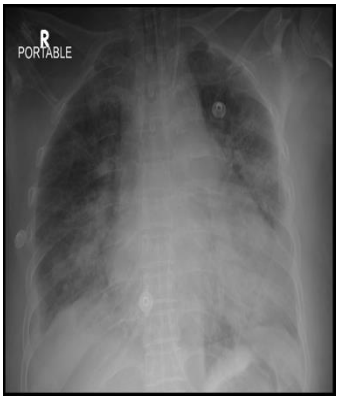

Image 5: Showed chest X-ray was taken to look for progression of disease

Reported as:

1. Previously seen ill-defined opacities are now becoming more consolidated and easily detectable. These are scatter in all zones of both hemi thoraces

2. Ill-define interstitial reticular densities and peri-bronchilar cuffs are seen in both upper and mid zones.

3. Bilateral pleural effusion worse on the left

Conclusion: Worsening radiographic signs of active chest infection with bilateral pleural effusions.

Image 6: Showed chest X-ray was taken to look for progression of disease

Reported as:

1. Diffuse reticular with patchy ill-defined and ring like opacitiesare scattered in both hemi thoraces.

2. Blurring of both diaphragmatic outlines and the heart borders indicate more extensive lung involvements as compared to previous study.

3. Associated bilateral pleural effusions are again noted.

Case discussion

Our patient did not present with any classical symptoms of pneumonia; fever, cough, chest pain or shortness of breath. Auscultation of lungs revealed no crepitations as well. Ironically, abdomen was tender on right hypochondrium and epigastric regions. Hence, the lung findings in chest x-ray consistent with active chest infection were overlooked by our team. Furthermore, the findings were subtle and was not easily detectable without comparison with prior chest x-ray. This highlights the significance of thorough comparison of chest x-rays especially when signs and symptoms cannot guide us. A formal reporting from a radiologist would be the best to avoid missing subtle signs.

Our patient presented with right hypochondrial and epigastric pain. Via the serial chest x-ray reporting it has been noted right lower zone was involved pre-dominantly during her COVID-19 infection and during her early stages on current presentation. The on-going infection in the right lower zone could possibly irritate the diaphragm and cause pain in the aforementioned regions, mimicking acute cholecystitis [1]. This possible pathogenesis shows the significance of having a baseline chest x-ray to rule out pneumonia even in adults who presents with hypochondrial

or epigastric abdominal pain [6]. This is more relevant in patients who had prior COVID-19 infection as they are more predisposed to having a pneumonia [7].

The progression of the infection from right lower zone to both hemi thoraces leading to patient's desaturation and collapse is established in the serial chest x-ray. Since our patient collapsed on day 4 of admission, we suggested a repeat chest x-ray on Day 3 of admission.By doing so, it not only help us to find missed chest infection, but also detect a de-novo nosocomial infection as the compromised lung state post-infection increases risk of secondary infection. A lower threshold for a more frequent repeat chest x-ray (e.g.: Day 2 of admission) is strongly advised, especially when patients are not improving with on-going management. However, a repeat chest x-ray delayed for more than 3 days of admission is not recommended to avoid missing an on-going pathology.

In our patient, the pneumonia was atypical. There was no fever and cultures were negative as well. A second COVID-19 infection was ruled out as well. Despite all, patient deteriorated and could not be saved. We presume the rapid deterioration is due the presence of pulmonary embolism facilitating a more rapid damage of lung tissues. Perhaps an earlier correct diagnosis would have altered the patient to a better course. Therefore, the threshold for CT thorax should be low to look for pulmonary thrombo-embolism events in patients with post-COVID 19 infections as they are of high risk [8].

Conclusion

In this new era of COVID-19 pandemic, it is best for we surgeons to have lung pathology as a differential diagnosis. This is especially true in cases with epigastric or hypochondria pain with the other tell-tale sign not pinpointing a specific abdominal pathology. A simple, cost-effective serial chest x-ray with a thorough reporting can save our patient's life.

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