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# Incidental Findings of COVID-19 Pneumonia in Chest CT scan of Trauma Patients; a Case Series

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## Abstract

**Introduction:** COVID-19 is an infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a strain of coronavirus. The first cases were reported in Wuhan, China, in December 2019, later was officially recognized as a pandemic on March 11th, 2020.

**Case presentation:** Here we report five trauma cases admitted to our hospital, not for COVID-19 related symptoms, but chest computed tomography (CT) scan findings were suspicious of COVID-19 infection. Real-time reverse-transcription polymerase chain reaction (RT-PCR) assays for COVID-19 were reported as positive in these cases.

**Conclusion:** COVID-19 usually manifests with mild respiratory and constitutional symptoms, even some cases are asymptomatic.

**Key words:** COVID-19; Incidental Findings; Multiple Trauma; Tomography, X-Ray Computed

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## INTRODUCTION

The novel coronavirus disease (COVID-19) has quickly disseminated throughout the world and led to a pandemic, and still continues to spread [1-3]. Despite of considerable number of severe cases, COVID-19 usually manifests with mild respiratory and constitutional symptoms, even some cases are asymptomatic. There are some asymptomatic patients who present to hospitals with different chief complaints and symptoms unrelated to common manifestations of COVID-19; for example, trauma work up while COVID-19 is incidentally detected during evaluations [4-6]. Here we report five cases admitted to emergency department (ED) of Shariati Hospital, Tehran, Iran, not for COVID-19 symptoms, but due to abdominal and chest trauma. Further evaluations with chest computed tomography (CT) scan revealed suspicious findings suggesting COVID-19 infection that were consequently confirmed by positive reverse-transcription polymerase chain reaction (RT-PCR) COVID-19 test.

## CASE PRESENTATION

### *Case 1*

A 23-year-old pregnant woman, with gestational age of 20 weeks came to the ED due to multiple trauma following a motor-vehicle-collision (MVC). The patient had mild abdominal pain and intermittent cough for approximately 4 days without any fever, sore throat, dyspnea or myalgia. She had no vaginal bleeding, abnormal discharge or cramping. She had no medical problems and took only prenatal vitamins. She did not use tobacco or illicit drugs. Primary care examination after admission revealed blood pressure (BP) of 130/80 mmHg, pulse rate (PR) of 84 bpm, respiratory rate (RR) of 14/min and O2 saturation (O2Sat) of 95% in room air. Physical examination showed an alert but anxious woman with mild abdominal tenderness and minimal crackles in middle and lower lobes of the left lung. On speculum examination, cervix was closed with evidence of watery or bloody discharge. Fetal ultrasound at this time was reportedly normal. The baseline fetal heart rate was 150/min with accelerations and no decelerations. The next morning, the following symptoms developed in the patient: fever, headache, weakness, increasing cough, and shortness of breath with RR 20/min and O2Sat of 92% in room air. The patient underwent a low dose chest CT scan that revealed ground-glass opacities/consolidations in upper and lower lobes of the left lung (Figure 1).

### *Case 2*

A 19-year-old man presented to the ED with chief complaints of lower back and pelvic pain following a MVC. Physical examination revealed mild tenderness in the sacral region without evidence of

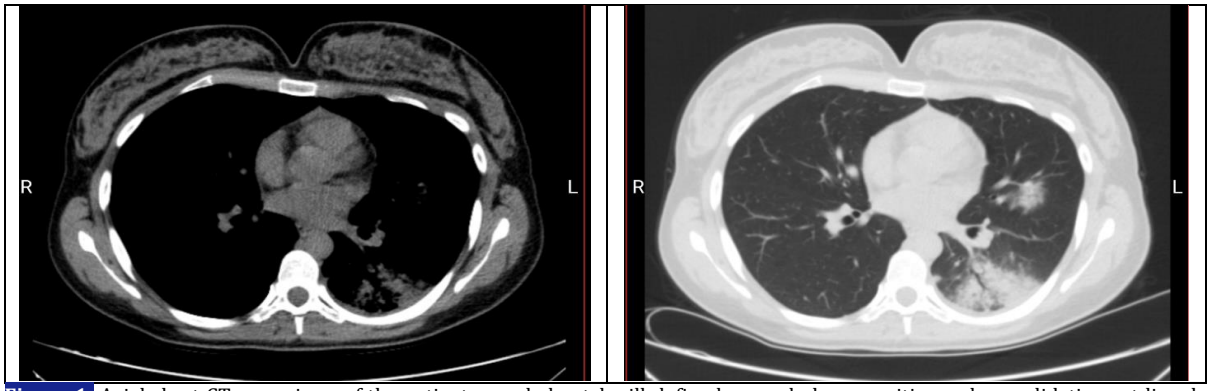


**Figure 1:** Axial chest CT scan views of the patient revealed patchy ill-defined ground-glass opacities and consolidations at lingula segment of the left upper lobe and superior segment of the left lower lobe

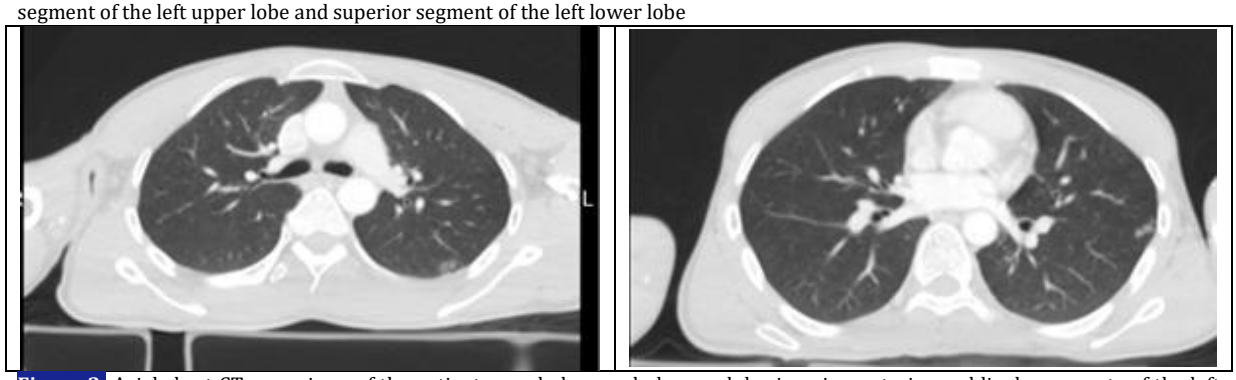


**Figure 2:** Axial chest CT scan views of the patient revealed ground-glass nodules in apicoposterior and ligula segments of the left lower lobe

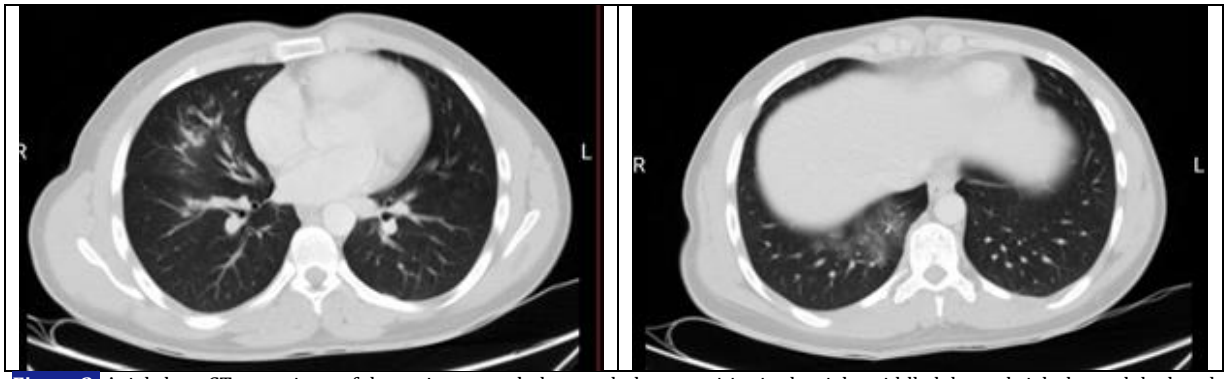


**Figure 3:** Axial chest CT scan views of the patient revealed ground-glass opacities in the right middle lobe and right lower lobe basal segment

palpable mass, hematoma and soft tissue swelling. The range of motion in lower limbs was within the normal range. Pelvic CT scan showed a fracture line in the sacrum. The patient had no other chief complaints, and BP, PR, RR and O2Sat were all normal. Lung auscultation was normal. Thoracoabdominopelvic CT scan was ordered to work up trauma, and chest CT scan revealed ground-glass nodules in the left upper lobe (Figure 2).

***Case 3***

A 20-year-old man was brought to the ED due to head trauma and loss of consciousness after crashing his motorcycle into a guard rail at high speed. The patient complained of mild pain in the frontal region but was otherwise feeling well and could walk and talk normally. The patient had no medical problems and took no medications. Neurological examination and initial brain CT scan were normal. No other chief complaint was present while BP was 120/85 mmHg, PR was 66/min and RR was 12/min. Thoracoabdominipelvic CT scan was ordered to rule out probable solid organ or thoracic injuries, in which ground-glass opacities were observed in the right middle and lower lobes (Figure 3). No evidence of pneumothorax, soft

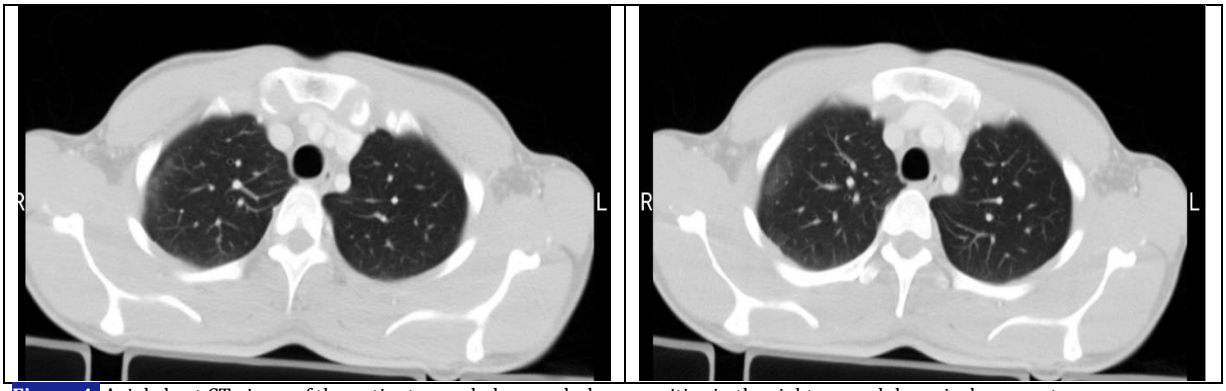


**Figure 4:** Axial chest CT views of the patient revealed ground-glass opacities in the right upper lobe apical segment

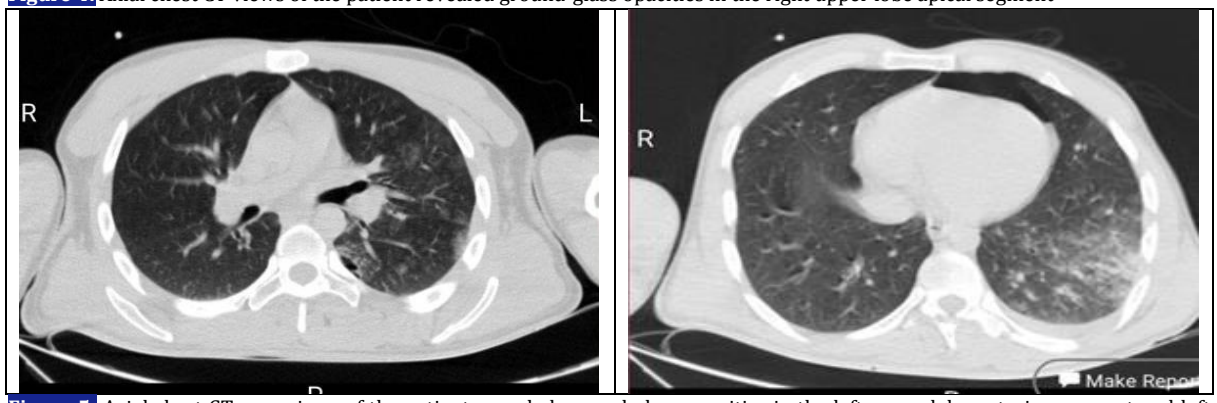


**Figure 5:** Axial chest CT scan views of the patient revealed ground-glass opacities in the left upper lobe anterior segment and left lower lobe superior segment

tissue hematoma, or any fracture was observed. O2 saturation was evaluated and was 93% in room air.

***Case 4***

A 19-year-old man presented to the ED with thoracoabdominal trauma after falling. The patient had no medical problems and took no medications. On arrival, patients' temperature was 37.9 ˚C, BP was 100/70 mmHg, PR was 102/min, RR was 26/min and O2Sat was 94%. No history of cough, myalgia or any flue like syndrome was present. Auscultation of the chest was unremarkable. Physical examination revealed no signs of limb or low back pain suggesting compression fracture of the long bones or vertebrae, or any other visible injury in thoracoabdominopelic region. Given the history of abdominopelvic trauma, CT scan was ordered, which revealed peripheral ground-glass opacities at the right upper lobe (Figure 4).

***Case 5***

A 22-year-old man presented with a decreased level of consciousness due to a high-speed highway motor vehicle collision. His initial BP was 100/70 mmHg, temperature was 38.9 ˚C, PR was 102/min, RR was 23/min and O2Sat was 94%. Physical examination revealed bruises over the chest wall on the left side with mid-zone crackles in the lung auscultation. Scalp hematoma was also observed on the left side of the cranium. Brain CT scan was normal without evidence of intracerebral hematoma and fracture. The patient had no history of cough, sore throat, or dyspnea. Chest CT scan revealed mild left-sided pneumothorax and ground-glass opacities in the left lung with no evidence of rib fractures (Figure 5). Initially, they were attributed to lung contusions, but the patient developed fever and cough at the end of the third day, associated with new-onset of dyspnea (PR 28/min).

## Discussion

Currently, COVID-19 is a pandemic respiratory disease [7]. This virus with its highly contagious course has spread rapidly throughout the world. Given the circulation of the virus in any region of the world, elimination of COVID-19 is a global health problem. If the virus cannot be controlled, the increase of infection rate and mortality of the coronavirus is inevitable. The mean incubation period of 5.2 days of COVID-19 pneumonia facilitated its global dissemination through air travelers [6]. During the incubation period, asymptomatic patients can contaminate healthy

individuals due to highly contagious nature of the virus. Moreover, a high viral load is reported in sputum during the recovery time [8]. Some of the asymptomatic patients presented with trauma without any COVID19 related symptoms, who were incidentally diagnosed with COVID-19 during trauma work up through chest and/or abdominal CT scans with limited cuts of lung bases, and radiologic signs suggestive of COVID-19 pneumonia [9, 10]. Early diagnosis and quarantine of the asymptomatic patients with COVID-19 could prevent the infection of a large population. Patients with COVID-19 manifest common symptoms of fever, cough, fatigue, sputum production and shortness of breath while other less common presentations are myalgia/arthralgia, headache, sore throat, chills and pleuritic chest pain [11, 12]. Imaging plays a critical diagnostic role in patients suspected of COVID-19, and can evaluate the intensity and progression of COVID-19 pneumonia. Chest radiography is used as the first-line imaging modality for suspected COVID-19 infection although it is less sensitive than chest CT scan and may be normal in early stages or mild cases [13]. But a significant percentage of patients with COVID-19 who required hospitalization had abnormalities in chest radiographs and these findings were more extended approximately 10-12 days after the initial presentation of the symptoms [13]. The most common radiographic imaging findings were airspace opacities defined as consolidations or ground-glass opacities mostly with bilateral, peripheral and lower zones distributions [13, 14]. In epidemic areas, chest CT scan is a more rapid and reliable diagnostic method in comparison to RT-PCR for assessment of COVID-19 pneumonia. It was reported that chest CT scan has a sensitivity of 97% for diagnosing COVID-19, which is higher than that of RT-PCR [10, 15]. Therefore, radiologists and radiology technicians should be aware of the initial imaging manifestations of COVID-19 infection. The common primary imaging findings in chest CT scans are ground-glass opacities, crazy paving appearances, airspace consolidations, bronchovascular thickening and tractional bronchiectasis that are commonly predominant in the basal zones with bilateral and peripheral distributions [16-19]. Recent cases and similar observations appear to be an incidental finding. Therefore, healthcare providers should protect themselves against COVID-19 pneumonia when they are treating symptomatic or asymptomatic trauma patients with regard to the recent outbreak of COVID-19 infection.

## Conclusions

COVID-19 usually manifests with mild respiratory and constitutional symptoms, even some cases are asymptomatic. During the incubation period, asymptomatic patients can contaminate healthy individuals with regard to the highly contagious nature of the virus. Healthcare providers should be made safe and protect themselves against COVID-19 infection, at all times, with regard to its global outbreak.

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## Authors' contribution

All the authors met the standards of authorship based on the recommendations of the International Committee of Medical Journal Editors.

## Conflict of interest

None declared.

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