



## Interest of Chest Imaging for COVID 19 Screening, Case Report

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### Summary

The COVID 19 pandemic is causing health systems to question and adapt to the issues arising from this epidemic. The reliability of RT-PCR has shown its limits. The place of clinical and pulmonary ultrasound in the detection of suspected COVID 19 cases should be emphasized, to justify a diagnostic conformation by CT.

### Keywords

COVID, ultrasound, RT-PCR, scanner, ECG, CT, case report, diagnosis

### Introduction

Since the global emergence of the COVID 19 pandemic, the scientific community regularly highlights new discoveries. This coronavirus, which has been raging these past months, is responsible for thousands of victims. Many are the scientific committees or health institutions that regularly publish new recommendations or directives for the care of people with the MERSCoV infection.

Our national institutions recommend performing RT-PCR [1] screening for people with symptoms suggestive of COVID. The chest scanner is reserved for those with signs of clinical severity [2]. Some patients have reported difficulties accessing a general practitioner or a technical diagnostic platform permitting confirmation of a COVID infection 19.

### Clinical case

We present the case of two patients who were seen and followed during the month of April 2020, by the health service of the Departmental Fire and Rescue Service (SDIS34) of the Herault in France. This consultation was carried out at their request, during a strong epidemic period, with a saturation of hospital health capacities, and the difficulty of accessing general practitioners and technical platforms.

Patient A, a 63-year-old woman, presented symptoms such as rhinorrhea, asthenia, anosmia, muscle or joint pain, and dyspnea. Patient B, a 31-year-old man, experienced asthenia, headache, and dyspnea. Neither showed signs of respiratory or hemodynamic severity. The presentation of these symptoms justified a medical consultation.

### Diagnosis

These two patients were seen and examined in the consultation office of the SDIS34 health service, respectively on the 2nd and 3rd day after the onset of symptoms.

Their medical consultation included a clinical examination, the vital parameters of which are presented in Table 1, an electrocardiogram (ECG), and a pulmonary ultrasound (Table 1).

	PATIENT A	PATIENT B
Heart beat (bpm)	87	64
Blood pressure (mmHg)	147/78	137/83
Respiratory rate (cpm)	12	16
Capillary O2 saturation (%)	99	98

**Table 1:** Vital parameters measured during consultation.

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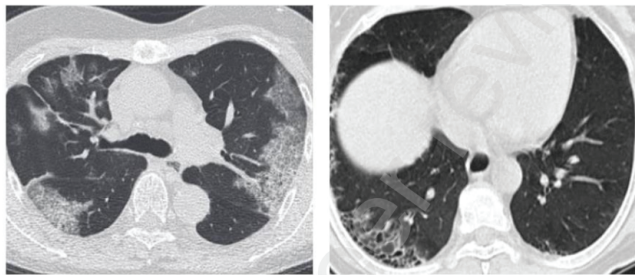
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**Figure 1:** Image of patient B's lung ultrasound, showing many B lines.



**Figure 2:** Lung CT image of patient A showing pneumonia and that of patient B showing right postero-basal condensation.

The interpretation of the electrocardiogram for patient A was normal, and with the appearance of a U wave for patient B. None of them had a conduction or repolarization disorder.

The pulmonary ultrasound revealed predominant B lines in the right pulmonary field, with no sign of pulmonary condensation for patient A, and a few B lines in a diffuse manner for patient B (Figure 1). These signs are those described in the initial phase of COVID infection [3].

### Progression

On medical decision, the two patients benefit from RT-PCR by nasal swab, a blood test including an NFS, CRP, fibrinogen, PCT, D-dimers, liver markers, renal assessment, troponin and BNP, and a non-injected chest CT, respectively on the 5th and 3rd day. The results of the blood biology, both carried out in the same laboratory, were normal for patient A according to the standards of this laboratory. For patient B, they showed very discreet inflammation (fibrinogen = 4.6 g / L [2.0-4.0], CRP = 11 mg / L [ $<5$ ]).

The nasal RT-PCRs of the two patients returned negative.

The thoracic scanner revealed ground-glass opacities beneath the pleurals, with banded condensations on the two inferior lobes, on an area of less than 10% for patient A. For patient B, the scanner indicates postero-basal condensation surrounded by a ground-glass halo. These images are highly suggestive [4] and confirm the diagnosis of COVID infection during this period of the epidemic.

The clinical condition of the patients was monitored, to be resolved within a few days (Figure 2).

### Discussion

From the experience of these two patients, several elements lead us to question our practices and our outpatient management of people suspected of COVID 19.

Several articles have shown the limits of nasal RT-PCR for the diagnosis or screening of COVID [5]. These two cases support the articles highlighting a sensitivity of the chest scanner at 98%, compared to 71% for RT-PCR, according to Fang and Ai [6]. The time between the onset of symptoms and the nasal swab is consistent with published work and recommendations. Ai and Ai [7] report up to 30% of cases where the chest CT scan shows signs of COVID infection, with people whose RT-PCR is negative.

The difficulty for the ambulatory care provider lies in the need to arrive at a diagnosis. He must be able to adopt an appropriate management strategy, which may include drug therapy, but above all, public health measures for the containment of suspects, and the insistence on the need to respect social barrier measures and hygiene. When available, chest ultrasound and chest scanner should be implemented for the diagnosis of people with suspected COVID and not just for patients admitted to intensive care or reanimation. These imaging tests allow one to strongly support clinical suspicion and to have confirmation and a diagnosis where RT-PCR shows too low sensitivity [8]. The availability of CT in ambulatory medicine, combined with the low sensitivity of RT-PCR, leads to questions about the diagnostic means for primary care practitioners during this COVID epidemic. This report confirms our medical decision when faced with a series of symptoms, some of which are described as pathognomonic for this infection. When it can be combined with a chest ultrasound with signs of interstitial syndrome, the clinical decision must lead to a strong suspicion of COVID 19. We promote the use of pulmonary ultrasound in the screening of people suspected of COVID [9].

The analysis of data from patients who have consulted our health service has enabled us to confirm the usefulness of the care path that has been put in place, by carrying out a medical consultation with pulmonary ultrasound, which could be complemented if necessary by blood biology, an RT-PCR and a non-injected chest CT. This publication remains an intellectual opening towards an improvement of our procedures, and needs to be validated by subsequent studies with sufficient means. Unfortunately, the occurrence of such a pandemic period with the constraints of confinement and scarcity of medical products and care must give way to medical decisions in the field, insofar as they are integrated into the individual benefit of patients and the collective population.

### Information and consent

The patients received individual written information in accordance with legislation on the protection of their rights and health data.

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