

## CHILAITIDI SYNDROME IN A 49-YEAR-OLD MALE WITH COVID-19 INFECTION – CASE REPORT

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**Abstract:** *The authors illustrate a case of a 49-year-old male patient admitted to our Emergency Department with dry persistent cough, fever, chills, vague abdominal discomfort and a recent history of dyspnoea and fatigability, symptoms suggestive of COVID-19 infection. Physical examination showed mild abdominal distension and no signs of peritoneal irritation. The patient was tested positive for COVID-19 and d-dimers were also found positive, raising a strong suspicion diagnosis of pulmonary thromboembolism as a complication of SARS-COV-2 infection, which required an immediate CT scan. No signs of pulmonary thromboembolism were present on the CT scan. Apart from bilateral pulmonary condensation areas having a ground glass pattern with a peripheral distribution, which are the characteristic radiologic feature of SARS-COV-2 infection, the CT scan also revealed the anterior interposition of the colon between the liver and diaphragm, this being highly suggestive for Chilaiditi Syndrome.*

**Key words:** *Chilaiditi Syndrome, SARS-COV-2, Hepatodiaphragmatic Interposition, COVID-19.*

### 1. Introduction

Chilaiditi syndrome is defined as a rare condition in which a segment of the colon is abnormally interposed anteriorly in between the diaphragm and the liver [1], [2].

When the patient describes no symptoms, this clinical finding is termed as the Chilaiditi sign, however when symptoms do occur, these cases are described as the Chilaiditi syndrome. [1], [3]. Chilaiditi sign has a 0.025% to 0.28% incidence worldwide, being more common

in men. It has also been reported in children [4, 5].

The etiology of the Chilaiditi syndrome is rarely known, due to its low prevalence, but it may occur in patients with the following pathologies: chronic lung diseases (pulmonary emphysema), liver diseases (cirrhosis, ascites, liver atrophy, relative atrophy in the medial segment of the left hepatic lobe), absence/laxity/elongation of the ligament suspending the transverse colon or of the falciform ligament, a long and mobile colon

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(dolichocolon) or congenital malpositions, chronic constipation, diaphragmatic paralysis, aerophagia (gaseous distension of the colon), obesity or multiple pregnancies (due to increased intra-abdominal pressure). Schizophrenia or mental retardation are also associated with anatomic abnormalities that could result in Chilaiditi sign [4], [6-9].

The anterior interposition of colonic loops between the right hemidiaphragm and liver is usually an asymptomatic radiologic sign. However, patients diagnosed with Chilaiditi syndrome, frequently experience gastrointestinal symptoms, such as abdominal pain, nausea, vomiting and constipation, followed by moderate to severe dyspnoea, that could sometimes lead to respiratory distress. Chest pain has been rarely reported among the common symptoms of the Chilaiditi syndrome [6], [10], [11].

Chilaiditi syndrome should be differentiated from the following diseases: pneumoperitoneum, bowel perforation, bowel obstruction, diaphragmatic hernia, subdiaphragmatic abscesses, Ogilvie syndrome, ischemic bowel, intussusception, volvulus, appendicitis, diverticulitis [12-14].

Although the syndrome is usually considered to be a benign condition, major complications can occur, which require immediate surgical treatment, such as mesentery ischemia volvulus of the cecum, transverse colon or splenic flexure, peritonitis, subdiaphragmatic appendicitis, perforation of the cecum [3], [15-18].

## 2. Case Presentation

A 49-year-old Romanian man was admitted to our Emergency Department with dry persistent cough, fever, chills,

vague abdominal discomfort and a recent history of dyspnoea and fatigability symptoms suggestive of COVID-19 infection. He denied a previous similar episode.

His past medical history included dyslipidemia, chronic hepatitis, non-alcoholic fatty liver disease. He was known with chronic constipation, having a stool frequency of less than three per week. The patient was not known with any cardiovascular diseases. The patient denied smoking, alcohol or any drug use.

The patient presented upon initial examination a temperature of 38.7° C, blood pressure of 157/86 mmHg, tachycardia (pulse = 105 beats/minute), tachypnoea (respiratory rate = 23), and oxygen saturation of 92% on room air. The cardiovascular examination revealed a regular heart rate and rhythm, no murmurs. The EKG of the patient showed normal sinus rhythm, tachycardia and no ST segment elevations or depressions were present, ruling out any cardiac causes.

Physical examination showed mild abdominal distension and no signs of peritoneal irritation.

Laboratory investigations showed normal levels of cardiac enzymes (CK-MB and Troponin-I), a normal kidney function (serum creatinine = 0.941 mg/dl, serum urea = 35.9 mg/dl), mildly high levels of white blood cells = 12.840, mcl and neutrophils = 10.690/mcl) and a normal C reactive protein value. Significantly high ferritin (709 ng/ml) and fibrinogen 401.26 mg/dl) levels were detected. Other laboratory results showed: LDH = 273 U/l, prothrombin time = 13.8 s, INR = 1.26, TGP = 48.5 U/L, TGO = 26.4 U/L, normal serum amylase, normal electrolytes levels (serum sodium = 138.3 mmol/L, serum potassium = 3.66 mmol/L, serum chloride = 102.9

mmol/L) and normal total and direct bilirubin levels.

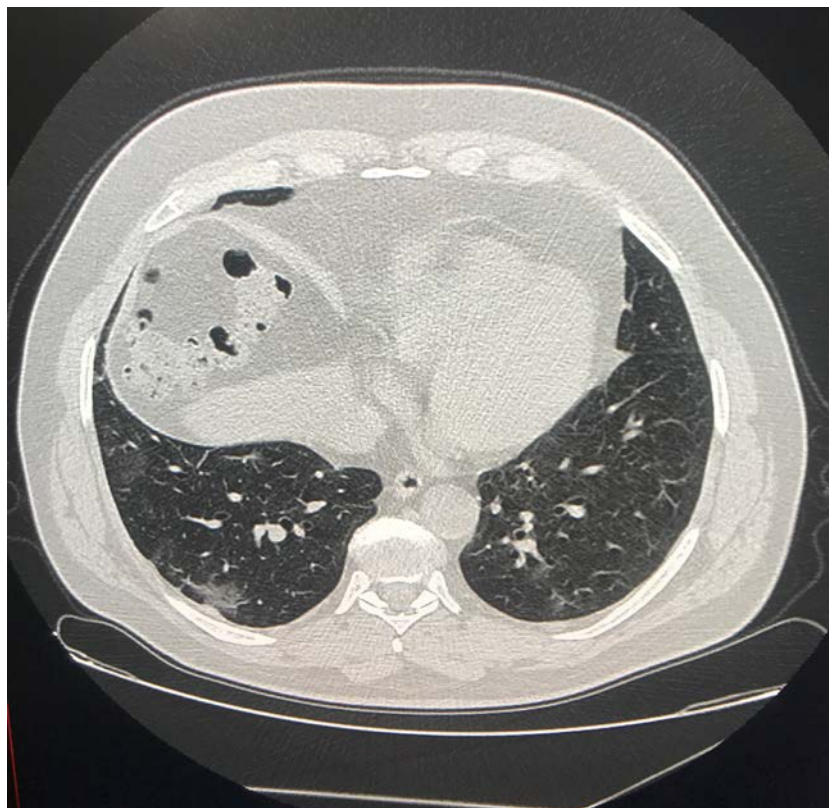
Furthermore, the patient was tested positive for COVID-19 (nasal swab test - Real Time PCR SARS-COV-2 ARN) and d-dimers were also found positive, raising a strong suspicion diagnosis of pulmonary thromboembolism as a complication of SARS-COV-2 infection.

An immediate CT scan with contrast was performed. The CT scan of the thorax revealed a normal calibre of both pulmonary arteries, which were entirely homogeneously opacified by the contrast, without any lacunar images present in their lumen, which could have been

suggestive for pulmonary thromboembolism.

Moreover, small multifocal bilateral, pulmonary condensation areas having a ground glass pattern with a peripheral distribution suggestive for COVID-19 infection were described. The CT images of the lungs showed less than 25% involvement by visual assessment, which suggests a moderate form of COVID-19 infection (Figure 1).

No pleural effusions, no mediastinal lymphadenopathies were present.



*Fig. 1. Thorax CT scan - Axial view – COVID-19 infection and the anterior interposition of colonic loops between the right hemidiaphragm and liver*

Apart from this, an incidental radiologic finding was revealed: the anterior

interposition of the colon between the liver and diaphragm, this being highly suggestive for Chilaiditi Syndrome (Figures 2, 3).



Fig. 2. *Thorax CT scan - Coronal view – the anterior interposition of colonic loops between the right hemidiaphragm and liver*



Fig. 3. *Thorax CT scan - Sagittal view –  
The anterior interposition of colonic loops between the right hemidiaphragm and liver*

The CT scan also showed hepatic steatosis. The liver had a dysmorphic aspect with hypertrophy of the caudate and left lobe, which significantly extend to the left flank. The right lobe of the liver

presented an anterior capsular concavity, therefore having slightly reduced dimensions (Figure 4). No ascites was present.

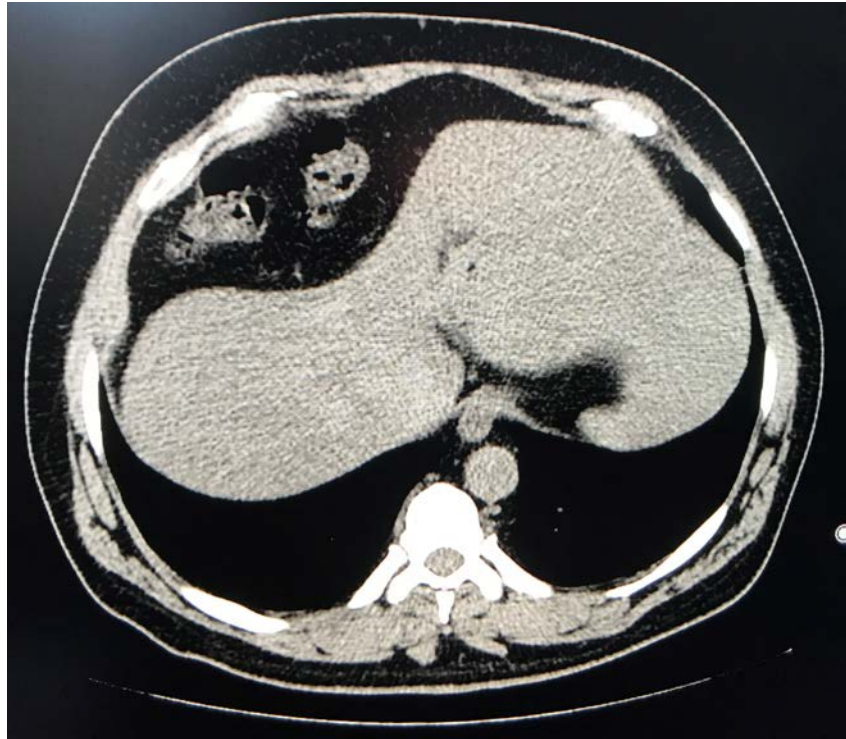


Fig. 4 . Thorax CT scan - Axial view –  
*The anterior interposition of colonic loops between the right hemidiaphragm and liver and hepatic steatosis*

Additionally, the patient received specific treatment for COVID-19 infection, and his general state improved considerably. After 8 days he was discharged. No pulmonary sequelae were present on the second CT scan performed before discharge.

Regarding the Chilaiditi syndrome, the patient did not require any specific treatment, due to his mild symptoms; most of the symptoms were COVID-19 related.

### 3. Conclusion

All things considered, early diagnosis of Chilaiditi's syndrome is of the utmost importance, as this rare condition can be easily mistaken for pneumoperitoneum,

which is a surgical emergency, leading to unnecessary surgical interventions and no improvement of the patient's general state. For this reason, this case report emphasizes the value of clinical consciousness of Chilaiditi's syndrome among physicians, in order to reduce the need of unnecessary surgical interventions.

Only in patients with severe symptoms, who indicate no improvement after conservative treatment or those with major complications, such as volvulus of the cecum, transverse colon or splenic flexure, mesentery ischemia, perforation of the cecum, peritonitis and subdiaphragmatic appendicitis should surgical intervention be considered.

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