

# Chilaiditi Syndrome

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## Abstract

The interposition of the colon or the small intestine between the liver and the diaphragm otherwise called Chilaiditi syndrome remains a rare condition. Its incidence varies between 0.025% and 0.28% according to recent literature and is only found incidentally on diagnostic imaging. Hence, it constitutes a classic pitfall in the diagnosis of false right pneumoperitoneum. We deem interesting to report a case of Chilaiditi syndrome in a 44-year-old patient with no significant history who was admitted at emergency department for abdominal trauma following a road accident.

## Keywords

Chilaiditi, Interposition, Colon, Small Intestine, Diaphragm, Liver Imaging

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## 1. Introduction

Chilaiditi syndrome is a condition characterized by the interposition of colon or small intestine between the liver and the diaphragm. It is a condition first described in 1865 by Cantini. However, it was only in 1910 that Demetrius Chilaiditi reported 3 cases of patients with radiological evidence of colonic interposition between the diaphragm and the liver [1]. Its discovery is most often incidental during chest or abdominal imaging. Chilaiditi sign is typical pitfall in the misdiagnosis of right false pneumoperitoneum. Global incidence of the malposition varies from 0.025% to 0.28% with a clear male predominance [2]. The affection is more common in the elderly. We hereby report the case of Chilaiditi syndrome in a 44-year-old patient with no significant history who presented at the emergency department with suspected abdominal trauma following a road accident.

## 2. Case Report

Patient, 44 years old with no significant clinical history admitted to emergency ward for abdominal trauma following a road accident. Symptoms dated back a few hours prior to his admission after patient was involved in a motorcycle collision with right-side impact on fall.

Physical examination found a conscious patient, stable vitals with abdominal examination revealing right upper quadrant tenderness.

Lab tests came back unremarkable.

Plain chest radiograph centered on the diaphragmatic dome revealed a gas shadow in the epigastric region (**Figure 1**).

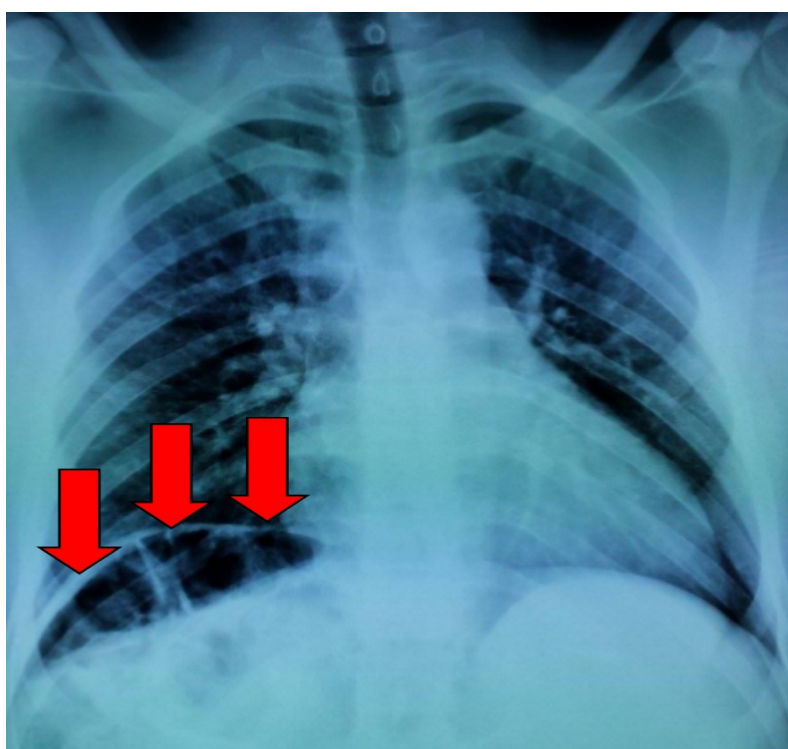
Abdominal CT showed a colonic interposition between the liver and the diaphragm (**Figures 2-4**) without pneumatosis in the cavity and segment VI liver contusion.

Management entailed administration of intra venous analgesics and proton-pump inhibitors with close monitoring of vitals and biological markers.

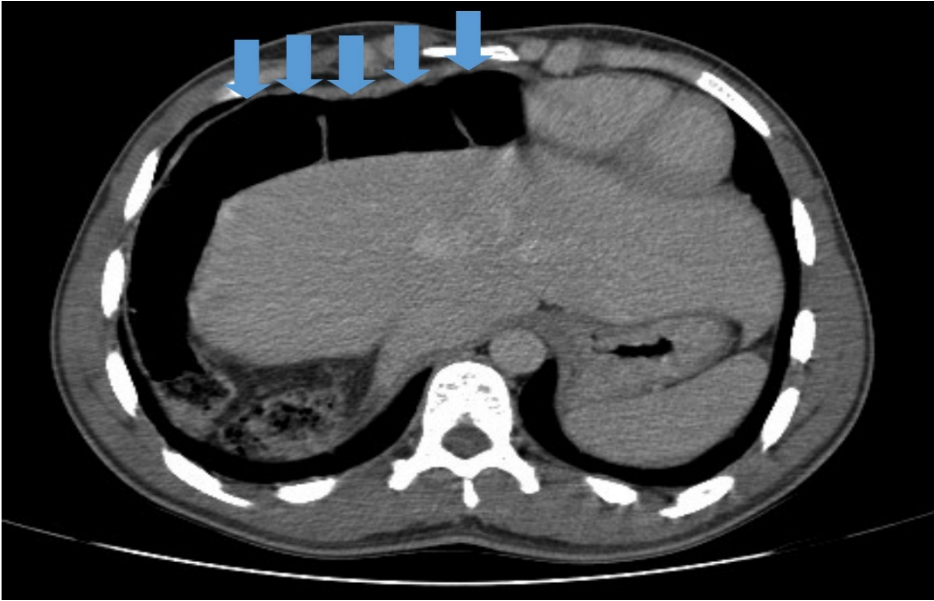
Clinical course was uneventful with favorable outcome after conservative management.

## 3. Discussion

Chilaiditi syndrome is a rare condition. Globally, its incidence is estimated between 0.025% to 0.28% with the affection more common in adult males as was the case in our patient [2].



**Figure 1.** Plain radiograph showing gas shadow between liver and diaphragm.



**Figure 2.** Abdominal CT showing colic interposition between liver and anterior abdominal wall.



**Figure 3.** Abdominal CT coronal section showing colic interposition between liver and diaphragm.



**Figure 4.** Abdominal CT sagittal section showing interposition of colic interposition between liver and diaphragm.

As per its pathogenesis, it is well established that normal embryological development of the liver as well as means of fixation of the intestine prevents interposition of the colon between the diaphragm and the liver. However, in certain rare anatomical variations, notably hypotrophy of the liver or agenesis of the right lobe of the liver, or in the event of elongation of the suspensory ligament of the liver, elongation of the colon (dolichocolon), poor fixation or poor position of the colon, congenital pathologies of the small intestine or diaphragm with elevation of the right hemidiaphragm (eventration), relaxation or agenesis of the suspensory ligament of the mesentery [3] [4] [5] the latter could occur. These factors may be present in 6% of patients at birth. On the other hand, in adults other factors including cirrhosis [6], chronic constipation, increased abdominal pressure (pregnancy), obesity [7], enlargement of the lower rib cage due to chronic obstructive pneumonitis with a large space in which the interposition of the colon may occur [1] are also believed to be contributory factors.

From a pathology standpoint, colonic segments involved in the interposition

between the liver and the diaphragm or the abdominal wall are mostly the transverse colon, followed by the right colic flexure even though cases involving small intestine interposition have also been reported [7].

Colonic interposition is often asymptomatic despite relative higher incidence of radiological evidence [8].

As far as its diagnosis is concerned, interposition of the colon (Chilaiditi sign) is defined as the presence of a gas shadow below the right hemidiaphragm on plain abdominal X-ray. Positive diagnosis of Chilaiditi syndrome based on imaging requires the presence of the following criteria: elevation of the right diaphragmatic hemicupola by the intestine, gas distension of the colon beneath the diaphragm, lowering of the upper margin of the liver than the level of the left diaphragmatic hemicupola with no other positional anomalies [9].

Differential diagnosis of the syndrome involves mainly pneumoperitoneum [10] [11]. In addition, changes in patient positions do not change the location of radiological evidence unlike in a patient with free air in the peritoneal cavity.

#### 4. Conclusion

Chilaiditi syndrome is a rare pathological entity, discovered incidentally during diagnostic imaging and constitutes a major pitfall in the diagnosis of right false pneumoperitoneum.

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