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# Chilaiditi's sign or syndrome? Diagnostic question in two patients with concurrent cardiovascular diseases

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## Abstract

Chilaiditi's sign is the asymptomatic, usually incidental radiographic finding, in which a part of the intestine is located between the liver and the diaphragm. The term Chilaiditi syndrome is referred to cases with symptomatic hepatodiaphragmatic interposition. Chilaiditi's syndrome is usually associated with abdominal or lower thoracic symptoms. We present here the cases of two patients that were admitted with predominantly thoracic atypical pain. During cardiac work up, it was found that there was a concurrent heart disease for which both patients were managed. Although both patients were treated for the heart disease, a full conservative treatment was implemented, having in mind that Chilaiditi's syndrome instead of sign could be responsible for the symptoms. Patients' course was uneventful and they are regularly followed up.

## Introduction

The term Chilaiditi's sign is the asymptomatic, incidental radiologic finding of the abnormal presence of subphrenic air. This is caused by the hepatodiaphragmatic interposition of colon between the liver and the diaphragm. The Greek radiologist Demetrius Chilaiditi was the first to describe this benign abnormality in 1910 [1]. In cases of symptomatic hemidiaphragmatic interposition of colon, the condition is referred to as Chilaiditi's syndrome (CS). It is usually presented as abdominal pain, constipation, vomiting, respiratory distress, anorexia, volvulus, and obstruction. Chilaiditi's syndrome can be a self-resolving or a chronic condition [2].

In our cases, two patients were admitted due to diagnoses associated with atypical thoracic or thoracoabdominal pain. The first patient had an iatrogenic dissection of the left iliac artery secondary to intraluminal coronary angiography for coronary artery disease and the second had an ultrasonographic finding of a left atrial mass.

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## Case #1

A 73-year-old male, smoker (50p/y), was admitted to our hospital complaining of lower chest and abdominal pain. The pain was sharp in nature and radiated to both shoulders. He had a four days' history of coronary artery intervention due to coronary artery disease with the placement of two coronary stents (circumflex artery and diagonal coronary branches). On presentation, he was afebrile, with a blood pressure of 145/88mmHg, pulse of 67 beats/min, respiratory rate of 14 beats/min, and oxygen saturation of 96% on room air. His abdomen was soft but exhibited tenderness to deep palpation.

Breath sounds were decreased at the right base. In diagnostic workup with chest and abdominal MRI it was found that there was a profound interposition of intestines between liver and diaphragm (Figure 1). A small dissected area in the left iliac artery was also noted and it was attributed to iatrogenic laceration with dissection and recanalization. Dietary modifications such as smaller meals and longer meal-time were essential for relief of symtoms. Iliac tear is followed for the last 2 years and is healed. We believe that although symptoms were attributed to the artery dissection conservative treatment of colonic interposition was essential for differential diagnosis and better management.

## Case #2

A 71-year-old male was presented to our hospital with thoracoabdominal heaviness that was gradually deteriorated during the last one year. He described his pain as mild and dull. On presentation, he was afebrile with a blood pressure 124/70 mmHg, heart rate 66 beats per minute, and respiratory rate 14/ per minute. He has a history of coronary artery bypass grafting 3 years before. He had a normal white blood cell count of $8.2\times10^9$/L. Serum biochemistry studies were normal. Chest radiograph showed a gas collection over the right subdiaphragmatic area. A heart ultrasound was performed that revealed the presence of a mass in the left atrium attached on the interatrial septum. CT scan of the thorax, abdomen, and pelvis showed a loop of colon interpositioned between the liver and right hemidiaphragm, mimicking free air (Figure 2). He was subjected to right thoracotomy and the mass was re-

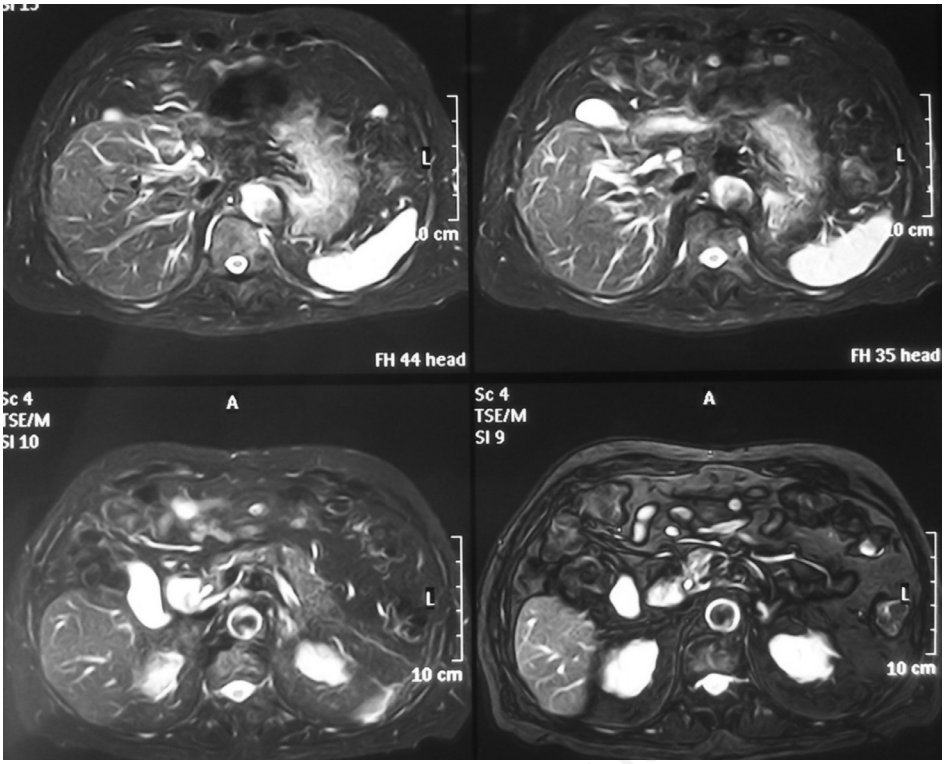


Figure 1. Chest and abdominal MRI with contrast material, showed intestines interpositioned between liver and right hemidiaphragm.

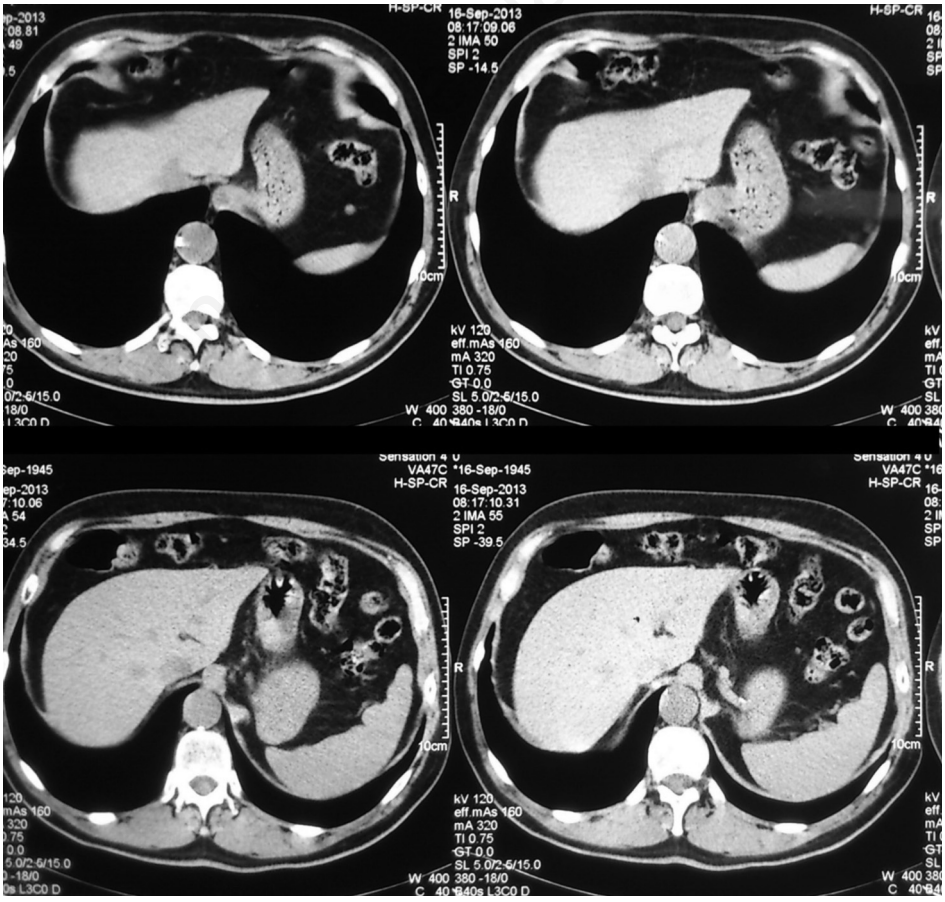


Figure 2. CT scan of the thorax and abdomen with contrast material, showed intestines interpositioned between liver and right hemidiaphragm.

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moved through a left atrial incision with the assistance of the heart lung machine (cannulation of upper and lower vena cavae and right femoral artery). It was found that the mass was a heart myxoma. Conservative treatment for the gastrointestinal symptoms was intensively performed and symptoms relieved.

## Discussion

Chilaiditi's sign is a rare condition found in 0.02% to 0.2% of all chest and abdominal films. Chilaiditi syndrome is characterized by the presence of symptoms and has a male predominance [3]. It may lead to serious complications but surgical intervention is rarely required. The etiology of Chilaiditi syndrome is debated. Congenital abnormalities like absent suspensory or falciform ligaments, redundant colon, malposition, dolichocolon, and paralysis of the right hemidiaphragm have been reported. The mainstay of conservative management is bed rest, nasogastric and/or rectal decompression, and liquid replacement. Surgery may be required in patients with persistent pain, refractory ileus, and signs of bowel ischemia [4].

In our cases, diagnosis was debated because of the concurrent findings of heart disease with vague thoracic symptoms that could be attributed to CS. The possibility of facing symptoms attributed to a second concurrent disease is always present especially if the most serious disease is profound. In our cases, we managed patients with conservative measures with bowel decompression. We operated on the second patient due to the mass, having in mind that symptoms may not be attributed to the myxoma but instead related to CS or at least contribute to their presence. In the first case the patient was managed conservatively being prepared for an operation in case of signs of intestinal ischemia that could be attributed to progression of the iliac dissection to other aortic segments or CS [5].

Although CS has been linked with pulmonary and gastrointestinal malignancies, the issue of cardiovascular diseases along with CS has not been given attention in the literature. A rare case of Chilaiditi syndrome incidentally associated with hypertension and ischemic heart disease, in a male aged 50 years has been previously reported [6].

The main question again is: what causes the symptoms. For this to be answered even if it seems to be an easy question in may lead in disaster. If repeat imaging shows failure of resolution or if ischemia is suspected, surgical treatment is indicated. A thorough examination must be performed because patient may have other heart and vascular problems that could have been easily missed, as in our cases [7].

In almost every patient a conservative management should be the first-line treatment and includes both lifestyle or dietary modification and drug therapy. Surgical technique should be personalized according to the anatomical site and their diagnostic possibilities.

## Conclusion

Accurate diagnosis rests on a careful physical examination and laboratory evaluation and wise clinical judgment. Right upper-quadrant pain is often encountered in primary care practice and has many diagnostic possibilities, including benign, self-limited conditions such as Chilaiditi syndrome. In our cases, ischemic heart disease, iliac dissection and left atrial myxoma could have been life threatening if not diagnosed and properly treated or if complicated. As a first step both patients were admitted in the surgical department and an initial conservative management was selected.

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