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Case Report
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Differentiating Chilaiditi signs from Chilaiditi syndrome

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ABSTRACT

Chilaiditi is an extremely rare anatomical condition, which may present asymptomatically or symptomatically with or without complications. Differentiation between chilaiditi signs and chilaiditi syndrome and having knowledge of the possible complications is important so as to decide when to operate and when not to. Here, we present a rare case of a 66-year-old gentleman with chilaiditi syndrome causing complete obstruction of a small bowel loop.

Key words: *Chilaiditi, pneumoperitoneum, Chilaiditi sign, Chilaiditi syndrome*

Introduction

Chilaiditi, or hepatodiaphragmatic interposition of a bowel loop, is an extremely rare anatomical condition. Patients present asymptomatically with only radiological evidence, termed chilaiditi signs, or with symptoms ranging from mild colicky abdominal pain to complete acute intestinal obstruction, perforation or volvulus, referred to as chilaiditi syndrome. Most of the cases are treated conservatively unless they are complicated and a misdiagnosis of perforated hollow viscus leads to unnecessary exploration. We herein present a rare case of a 66-year-old gentleman with chilaiditi syndrome causing complete obstruction of a small bowel loop.

Case Report

A 66-year-old gentleman presented to the emergency department with complaints of colicky pain in the abdomen that began five days earlier in the upper half of the abdomen, which became continuous and diffuse over the previous two days with radiation of pain to the right shoulder, multiple episodes of bilious vomiting and constipation for two days. Past medical history revealed that the patient had recurrent episodes of colicky abdominal pain for four years and was on antihypertensive drugs for nine years. There was no history of trauma or previous surgeries. Patient was febrile, dehydrated with a pulse rate of 110 per minute, had a distended abdomen, had diffuse tenderness, guarding and rebound tenderness in the right hypochondrium, and obliteration of liver dullness and increased bowel sounds were present. Digital rectal examination was unremarkable. Laboratory studies showed leucocytosis and X-rays of the chest showed free gas under the right dome of the diaphragm (Figure 1). An abdominal radiograph in the standing and supine positions highlighted multiple air fluid levels. A preliminary diagnosis of acute intestinal obstruction with perforation was

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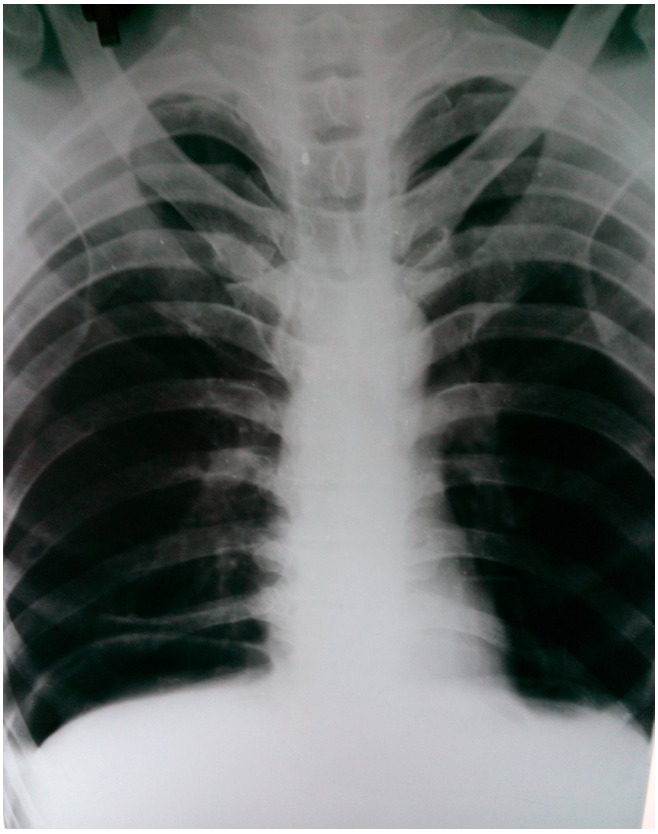

Figure 1. Chest X-ray: Chilaiditi mimicking pneumoperitoneum.

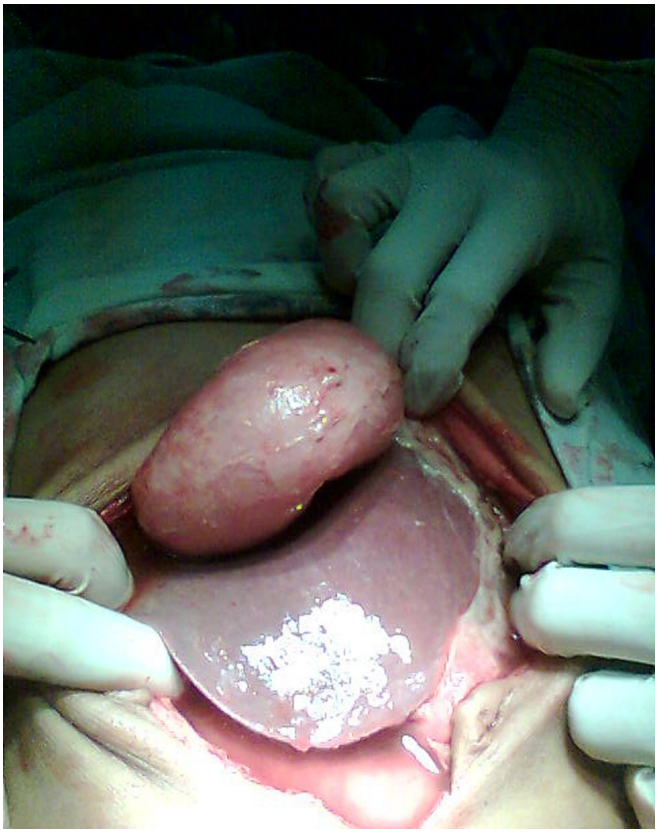

Figure 2. Intraoperative image of chilaiditi syndrome.

made and the patient was prepared for an exploratory laparotomy.

Upon exploration, there was minimal serous fluid and dilated small bowel loops in the abdomen with fibrinous exudates all over them. The ileal loop was seen to interpose between the liver and diaphragm leading to complete obstruction, and the bowel loop was reduced and assessed for viability, showing that it was edematous without any features of gangrene (Figure 2). The post-operative period was uneventful and the patient was discharged on the 7th postoperative day.

Discussion

The Greek radiologist, Demetrius Chilaiditi, more than a century ago in 1910, published a case series of three patients of hepatodiaphragmatic interposition of the colon [1]. The incidence of chilaiditi signs is 0.25% to 0.28% of the population [2]. Patients present asymptomatically with only radiological evidence, referred to as chilaiditi signs or with symptoms ranging from mild colicky abdominal pain to acute intestinal obstruction, perforation or volvulus, termed chilaiditi syndrome.

Chilaiditi can be congenital or acquired, however the exact cause is unknown. Several factors, like lack of suspensory ligaments of the transverse colon, atrophy, agenesis or a small liver, absent falciform ligaments, chronic lung disease, aerophagia, paralysis or eventration of the right diaphragm, redundant mesocolon, volvulus of the colon and redundant or dilated colon, are seen to be associated with chilaiditi [3]. Usually, hepatodiaphragmatic interposition of the bowel has three forms: interposition of the large intestine, interposition of the small intestine or interposition of both intestines. The most common of these is interposition of the large intestine and, very rarely, interposition of the stomach may also be observed [4].

Chilaiditi is more common in elderly males with a male to female ratio of 4:1, but can be seen in young patients, as well [5]. Patients present asymptomatically with only radiological evidence, chilaiditi signs, or with symptoms ranging from mild colicky abdominal pain, nausea, vomiting, flatulence and constipation to acute intestinal obstruction, perforation or volvulus, chilaiditi syndrome. Differential diagnoses include perforated hollow viscus, subdiaphragmatic abscess, diaphragmatic rupture, and Morgagni hernia. Diagnosis of chilaiditi is challenging and can be misleading to the surgeon and mistaken for more serious abnormalities, which may lead to unnecessary surgical interventions, especially

hollow viscus perforation [3-6].

Diagnosis of chilaiditi signs can be established on the basis of chest X-rays by the presence of haustral folds of the large bowel. They are not always seen on chest X-rays, however, and in these situations, left lateral decubitus radiographs of the abdomen help distinguish chilaiditi signs from pneumoperitoneum [7]. Furthermore, these haustral folds are not seen when the small bowel interposes between the liver, as was the case here. Another differentiation of chilaiditi signs from pneumoperitoneum is that the radiolucency does not shift upon change of position of the patient on the left lateral decubitus as seen in pneumoperitoneum [5]. Computed tomography (CT) scanning of the abdomen is a better modality to accurately diagnose chilaiditi with the added benefit of ruling out diaphragmatic rupture and Morgagni hernia [4,5]. On the other hand, diagnosis of chilaiditi syndrome and its complications is established clinically with the presence of symptoms and signs of obstruction and peritonitis.

Incidentally found chilaiditi signs do not necessitate surgery but should be differentiated from pneumoperitoneum [8]. Chilaiditi syndrome is managed conservatively unless it is complicated with volvulus, perforation or complete intestinal obstruction where surgical intervention becomes mandatory. Patients with persistent recurring symptoms are also managed surgically [2-7].

Conclusion

Chilaiditi is an extremely rare anatomical condition and a surgeon must be well versed in order to differentiate between chilaiditi signs and chilaiditi syndrome and should know when not to operate, thereby steering clear of unnecessary exploration as most of the time, it resolves with conservative management or timely intervention, avoiding morbidity and mortality of perforation, volvulus and complete intestinal obstruction.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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