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Chilaiditi Syndrome: Case Report in Pulmonology and Review of the Literature

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Abstract

Background: *Chilaiditi syndrome, is a rare condition characterized by the interposition of the colon (usually the transverse colon) between the liver and diaphragm. It can present with a variety of gastrointestinal and respiratory symptoms. This case report describes an elderly male with a complex medical history who presented with respiratory symptoms indicative of Chilaiditi syndrome and the subsequent management and outcomes.*

Case report: *A 58years old Ugandan male patient presented to emergency room (ER) at Kiruddu National Referral Hospital with a history of difficulty in breathing with easy fatigability for few days associated with dry cough & right-side chest pain and no fever or night sweating. He is known hypertensive and had stroke 9 years ago. Physical examination, showed, mild pallor, no jaundice, no cyanosis, no finger clubbing, BP 114/90, Temp. – 36.5°C, Pulse rate:114/min. Respiratory rate (RR): 22/min. SpO2: 80% on room air (R/A). Cardiovascular system examination: normal heart sounds (S1+S2) and no murmurs. Chest examination revealed stony dullness on the right side on percussion with decreased breath sounds on the right side. The abdomen was soft but tender in the right upper quadrant without signs of peritonitis. CNS: GCS-15/15, left sided hemiplegia. A chest X-ray (CXR) was performed, revealing an abnormal elevation of the right hemidiaphragm with underlying gas, suggesting possible bowel interposition with pleural effusion in the right side. He was admitted as a case of community acquired pneumonia. A CT scan of the chest was conducted, showing the transverse colon interposed between the liver and diaphragm, consistent with Chilaiditi syndrome. Patient received oxygen therapy, antibiotics, analgesics, chest physiotherapy and pleurocentensis was done for him. He was discharged in a good condition.*

Conclusion: *Chilaiditi syndrome should be considered in the differential diagnosis of patients presenting with respiratory symptoms, particularly in those with underlying pulmonary conditions and abnormal radiographic findings. Conservative management is typically effective, but careful monitoring is necessary to prevent complications.*

Keywords: *Chilaiditi syndrome, respiratory symptoms, Kampala, Uganda.*

Introduction

Chilaiditi syndrome is a rare condition characterized by the interposition of the colon (usually the transverse colon) between the liver and the diaphragm. This anatomical anomaly can lead to various clinical symptoms when accompanied by gastrointestinal or respiratory issues, distinguishing it from the asymptomatic Chilaiditi sign, which is merely the radiological finding without symptoms. Chilaiditi syndrome is relatively uncommon. Its prevalence varies but is estimated to be around 0.025% to 0.28% in the general population. It is more frequently observed in males and typically in older adults, although it can occur at any age. Certain predisposing factors include: Chronic lung diseases causing diaphragmatic elevation, Cirrhosis with hepatomegaly, Obesity, Chronic constipation or other conditions leading to increased intra-abdominal pressure [1].

Pathophysiology: The exact cause of Chilaiditi syndrome is not well understood, but several anatomical and physiological factors may contribute: Congenital or acquired abnormalities of the suspensory ligaments of the liver**.** An enlarged right lobe of the liver**.** Abnormal length or laxity of the colon and Increased intra-abdominal pressure leading to displacement of the colon [2].

Clinical Presentation: Symptoms of Chilaiditi syndrome can vary widely and may include: Abdominal pain and distension**.** Nausea and vomiting**.** Changes in bowel habits such as constipation or diarrhoea, respiratory symptoms like dyspnoea (difficulty breathing). Rarely, complications such as volvulus, bowel obstruction, or perforation may occur [2]. Chilaiditi syndrome diagnosis: is primarily based on imaging studies: Plain Radiography: Often the initial modality, showing gas between the liver and diaphragm. Computed Tomography (CT): Confirms the diagnosis by clearly demonstrating the interposition of the colon. Ultrasonography and MRI: These can also be useful but are less commonly used. It's crucial to differentiate Chilaiditi syndrome from other causes of pneumoperitoneum, such as bowel perforation, which is a surgical emergency. Management of Chilaiditi syndrome depends on the severity of symptoms: Asymptomatic Cases: Often require no treatment, just monitoring. Symptomatic Cases: Conservative management including bed rest, bowel decompression (nasogastric tube), laxatives, and enemas. Pain management with analgesics. Fluid and electrolyte balance correction. In refractory or complicated cases (e.g., volvulus or obstruction), surgical intervention may be necessary, such as colopexy (fixation of the colon) or resection of the involved

colon segment. The prognosis for patients with Chilaiditi syndrome is generally good, especially with appropriate management. Most cases resolve with conservative treatment, but it's important to monitor for potential complications which could require surgical intervention [3]. In this report we are presenting a case of 58 years old Ugandan male patient with a complex medical history who presented to emergency department at Kiruddu National Referral Hospital in Kampala with respiratory symptoms indicative of Chilaiditi syndrome and the subsequent management and outcomes.

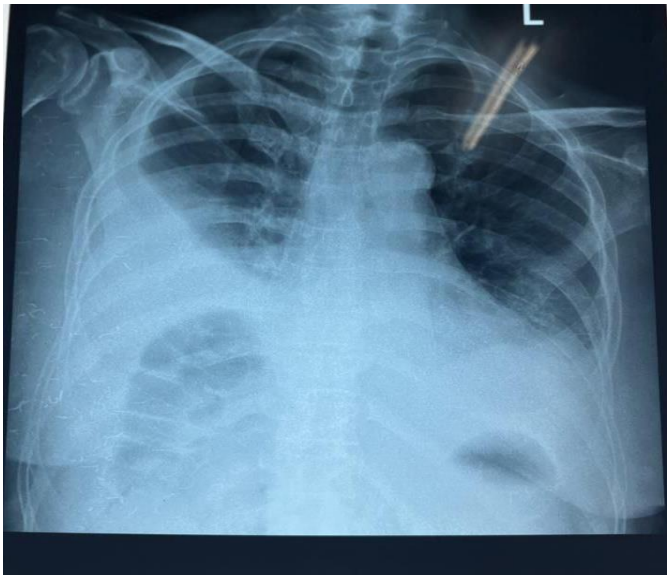
Ethical consideration

Approval for the case report was obtained from the ethical committee of Kiruddu National Referral Hospital in Kampala, as well as informed verbal consent from the patient's family, that the case may be reported.

Case presentation

A 58 years old Ugandan male, retired business man admitted on 20/5/2024 from the emergency department of Kiruddu National Referral Hospital in Kampala (The capital of Uganda), discharged on 01/06/2024. He presented to emergency department complaining of: Difficulty in breathing with easy fatigability for few days associated with dry cough & right sided chest pain, however no lower limbs swelling, palpitations, loss of consciousness, unintentional weight loss, night sweats or fever. He is known hypertensive for many years, on medication (Amlodipine 10mg once per day (O.D), Bisoprolol 5mg O.D) and had history of stroke 9 years ago with residual weakness in the left side. Review of systems was unremarkable. No history of similar condition or prior surgical operations. Family history: was unremarkable. He lives with his family and supported by his sons. On examination: mild pallor, no jaundice, no cyanosis, no finger clubbing, BP: 114/90, Temp.:36.5^{o}C, PR:114bpm, C.V.S: normal heart sounds(S1+S2) were heard and no murmurs. Respiratory system: RR: 22/min., SpO2 :80% R.A, Reduced Breath Sounds on the Right, Stony dullness on the RT. CNS: GCS-15/15, RT sided hemiplegia. Abdomen: Normal fullness, non-tender, no palpable liver or spleen. Investigations showed: C.B.C showed WBCs:10.8 with neutrophilia (81%), Hb.14.1, MCV,89.9 and platelets, 177 RBS ;11mmol/l. normal renal and liver function tests. CXR: Revealing Diffuse Heterogeneous opacities bilaterally & a massive pleural effusion on the right with bowel segment in right lower lobe, elevated right hemidiaphragm due to the presence of a bowel loop between the liver and diaphragm (Chilaiditi sign), (Figure 1). The patient was admitted to pulmonology ward in the hospital and was diagnosed as community acquired pneumonia started on IV Ceftriaxone and Tablet Paracetamol. Patient received oxygen therapy since admission in ER, (antibiotics was changed to intravenous IV levofloxacin, and oral azithromycin) and to continue oral amlodipine 10mg and Bisoprolol 5mg O.D as well as chest physiotherapy. ECG, ECHO and sputum for culture, urine test and PSA were requested with plan for pleurocentensis and CT chest. Pleurocentensis was done and1.3L of straw-coloured fluid was extracted on different days (800mls and 500ml). Chest CT: Bilateral compression Atelectasis in the basal segments with ground glass opacifications in the lower lobe in keeping with a pneumonic process with a parapneumonic effusion. Prominent Hepatic flexure in keeping with Chilaiditis (Figure 2-6) below. Pleural fluid analysis showed: Leucocytes 1-2hpf, RBC 30-40/hpf, LDH 440iu/l, ZN stain negative for AFB, Culture – No bacteria Growth. On 4th day of admission, blood pressure increased to: 141/103mmHg, SpO2 – 90% R.A. Brain CT showed: Right parietal/temporal lobe chronic ischemic infarct with gliosis. Losartan tabs 50mg was added to the anti-hypertensive medication, in addition to aspirin75 mg and atorvastatin and neuroton as advised by neurologist. The diagnosis of Chilaiditi Syndrome was considered. The patient continued to received oxygen depending on his oxygen saturation, antibiotics and antihypertensive in addition to chest and physiotherapy. Patient improved and was discharged in good condition on the same medication and for further follow up in outpatient clinic.

Figure 1: shows CXR of the patient.



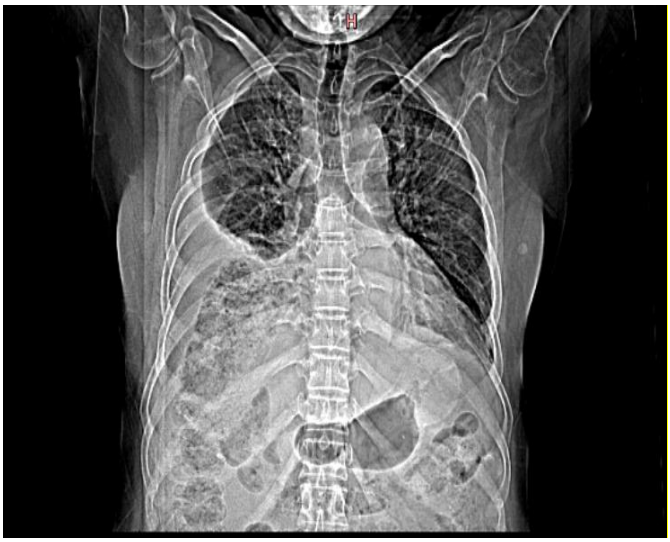


Figure (2): High Resolution–CT-CXR Reconstruction. Depicts bilateral pleural effusion with bowel loop extension into Rt Thoracic cavity.

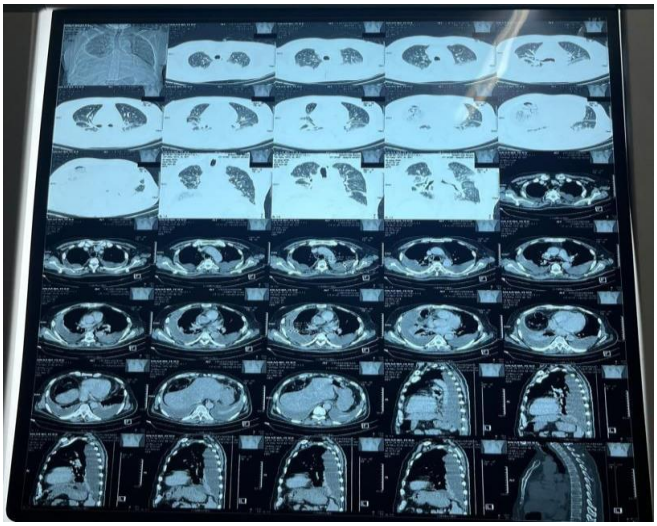


Figure 3: Shows chest CT scan of the patient.

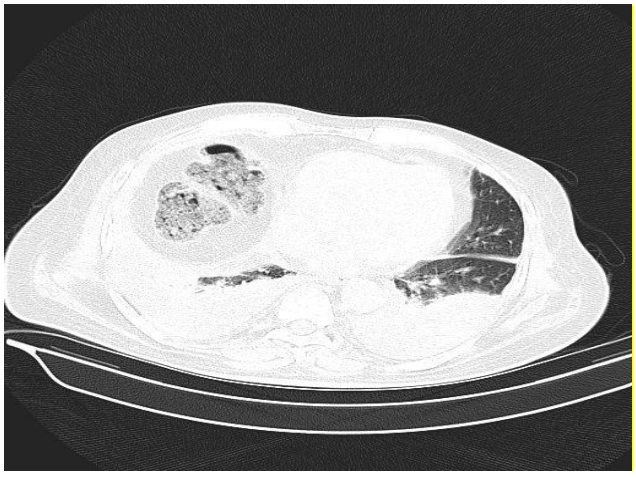


Figure (4): Thoracic CT–Coronal Section of Lung Window. Depicts bowel lumina on the Rt with heterogeneously attenuating contents.

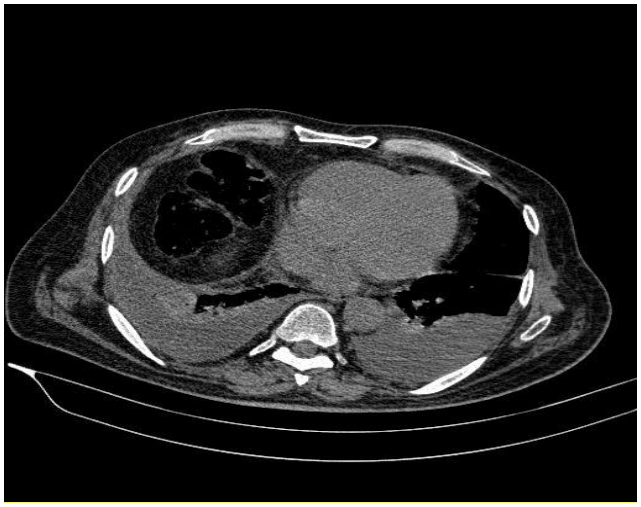


Figure (5): Thoracic CT–Coronal Section. Depicts pleural fluid associations with other thoracic contents.

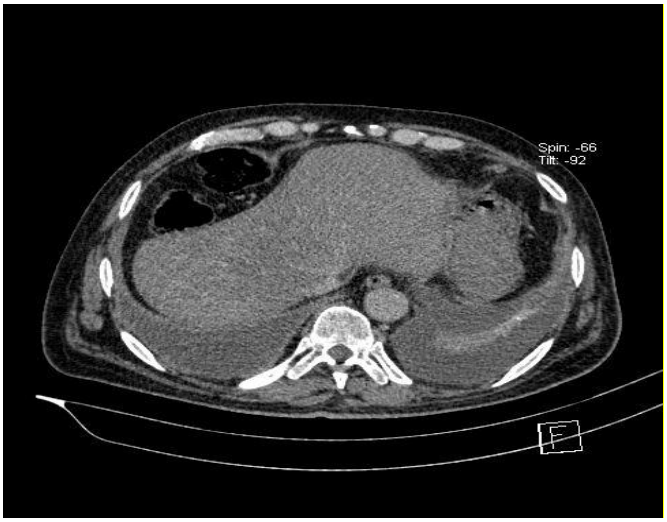


Figure (6): Thoracic CT Coronal Section. Depicts bowel juxtaposition with liver.

Discussion

Chilaiditi syndrome is a rare and often overlooked condition characterized by the interposition of the colon between the liver and the diaphragm. Although asymptomatic in many cases, it can present with a variety of symptoms, primarily gastrointestinal or respiratory in nature, which can complicate its diagnosis [1,2]. The case presented here highlights the complexity of diagnosing Chilaiditi syndrome, especially in patients with pre-existing conditions such as hypertension and previous strokes.

Clinical Presentation and Diagnosis

In this case, a 58-year-old Ugandan male presented with respiratory symptoms, including difficulty breathing, easy fatigability, dry cough, and right-sided chest pain. Initial assessment led to a diagnosis of community-acquired pneumonia, a common differential diagnosis given the respiratory presentation. However, the presence of bowel loops above the diaphragm in the chest X-ray suggested the possibility of Chilaiditi syndrome, which was later confirmed by a CT scan. This patient's presentation aligns with the literature, where respiratory symptoms, though less common than gastrointestinal symptoms, have been reported in Chilaiditi syndrome [4]. The respiratory symptoms are often due to diaphragmatic irritation or compression by the interposed bowel, leading to reduced lung capacity and respiratory distress [4,5,6]. On top of that, the presence of pleural effusion in this patient had most likely contributed to the development of the syndrome by increasing diaphragmatic pressure and altering normal anatomy**.**

Comparison with Other Cases

Symptom Variability: The symptomatology of Chilaiditi syndrome can vary widely. While some patients present with acute abdominal pain [7,8,9] others may have chronic symptoms or respiratory manifestations, as seen in this case. A study by Yin et al. [3], reported that only 26% of Chilaiditi syndrome cases present with respiratory symptoms, making this case particularly noteworthy.

Age and Gender Predilection:

Chilaiditi syndrome is more common in older adults and predominantly affects males. This aligns with our patient, who is a 58-year-old male, reflecting typical demographic characteristics observed in other case studies [2,10,11].

Precipitating Factors: Various factors contribute to the development of Chilaiditi syndrome, including anatomical abnormalities, chronic lung disease, and increased intra-abdominal pressure [1, 2,12]. In this case, the patient's history of hypertension and residual hemiplegia post-stroke could have contributed to alterations in diaphragmatic positioning, facilitating the interposition of the colon.

Management and Outcomes

The management of Chilaiditi syndrome typically involves conservative treatment, as surgical intervention is reserved for complications like volvulus or bowel obstruction [2,5,13]. Our patient was successfully managed with oxygen therapy, antibiotics, analgesics, and pleurocentensis, aligning with other case reports where conservative measures were effective.

Conservative Management Success:

Most cases, including this one, resolve with conservative treatment. A review by Orangio et al. found that conservative management is successful in over 90% of cases, with surgery being required only in cases with severe complications [2]. This is in contrast, cases reported by Lassandro et al. necessitated surgical intervention due to complications like bowel obstruction, highlighting the spectrum of management approaches depending on symptom severity and complications [1].

Prognosis and Follow-up: The prognosis for patients with Chilaiditi syndrome is generally favourable, especially with prompt and appropriate management. Our patient was discharged in good condition and advised for regular follow-ups. The literature supports a positive outcome in most cases, emphasizing the importance of recognizing this syndrome early to avoid unnecessary surgical interventions [6,14].

Conclusion

This case underscores the importance of considering Chilaiditi syndrome in patients with atypical respiratory symptoms, particularly when radiological findings are suggestive. It also highlights the efficacy of conservative management in uncomplicated cases. Comparative analysis with other cases in the literature reinforces the need for a thorough diagnostic approach to avoid misdiagnosis and to ensure effective treatment.

Disclosure

All authors have no confilict of interest.

Ethical consideration

Approval was taken from the ethical committee of Kiruddu National Referral Hospital in Kampala, as well as informed verbal consent from the patient’s family, that the case may be reported.

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