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Case Report

Non Resolving Pneumonia Turns Out to be Morgagni Hernia: A Case Report in a Patient with Down Syndrome

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Abstract

Right-sided congenital diaphragmatic hernias (CDH), especially Morgagni hernias with omental herniation, are rare and can be easily misdiagnosed due to presentation similarities with other conditions. This case report contributes to the medical literature by discussing a rare presentation of right-sided congenital Morgagni type diaphragmatic hernia (CDH) in a child with Down syndrome (Trisomy 21) with non-resolving pneumonia. A CT scan unexpectedly revealed a right-sided Morgagni hernia with omental herniation. Initially misinterpreted as an ongoing respiratory issue, the condition was successfully treated with robotic-assisted thoracic surgery (RATS), leading to a full recovery. This case highlights the importance of considering CDH in patients with persistent respiratory symptoms and the effectiveness of robotic surgery for repair.

Keywords: *Case Report; Congenital Diaphragmatic Hernia; Down's Syndrome; Omental Herniation; Morgagni Hernia; Robotic Surgery*

Abbreviations

CDH: Congenital Diaphragmatic Hernia; VSD: Ventricular Septal Defect

Introduction

Congenital diaphragmatic hernia (CDH) is a rare developmental defect that allows abdominal organs to protrude into the thoracic cavity leading to lung hypoplasia. Multiple factors play a role in the development of congenital diaphragmatic hernia, including genetic, environmental and nutritional. Majority of the hernias are on the left side and posterolateral in position [1]. The rarer form of congenital diaphragmatic hernia, Morgagni hernia (3 to 5%), results from a defect in the anteromedial part of the diaphragm usually presenting on the right side. Down syndrome is one of the aneuploidies associated with right sided hernia [2]. The infrequency of this type of hernia and the vague clinical presentation can lead to a missed diagnosis. We report a rare case of right-sided CDH with omental herniation in a patient with Down's syndrome, emphasizing diagnostic and surgical considerations.

Case Presentation

This is an 11-year-old male child with Down syndrome who presented with recent unresolved right-side pneumonia. Past medical history included hypothyroidism and symptoms of obstructive sleep apnea. On examination, he was afebrile with normal vital signs and upon auscultation, reduced air entry in the right lower zone was revealed. There was persistence of a patch of consolidation on chest x-ray that was noted during the acute illness.

A contrast-enhanced CT scan of the chest was performed to investigate the cause of non-resolution of pneumonia, as can be seen in figure 1, which revealed a Morgagni hernia in the right thoracic cavity measuring 11 x 6.3 x 6.4 mm, containing omentum without acute complications. An anteromedial parasternal defect (space of Larrey) measuring 5.5 x 1.7 mm was identified.

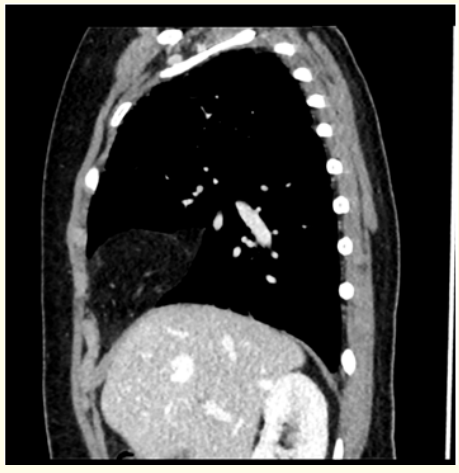

Figure 1: *CT Scan chest with Contrast showing Morgagni Hernia in the right chest cavity.*

He was scheduled for elective surgical repair and underwent laparoscopic robotic right diaphragmatic hernia repair. Intraoperative findings revealed a small defect at the cardio phrenic angle with herniation of omentum into the chest cavity, as seen in figure 2 and 3. Adhesion lysis was performed, the involved omentum was excised, and the edges of the defect were approximated properly, as can be seen in figure 4 and 5.

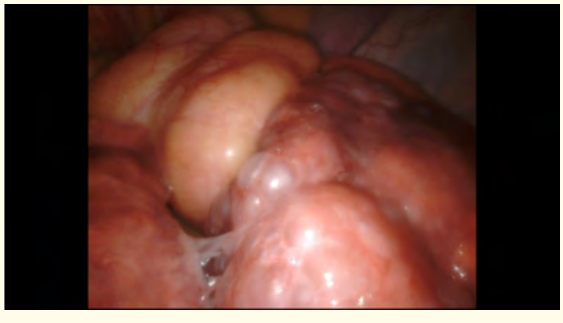

Figure 2: *Laparoscopy showing herniated omentum in the thoracic cavity.*

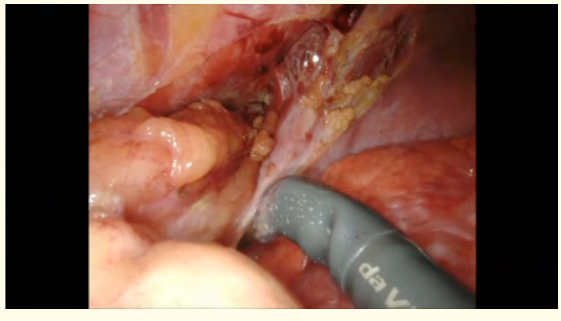

Figure 3: *Laparoscopy showing anteromedial Morgagni's hernia in the thoracic cavity identified.*

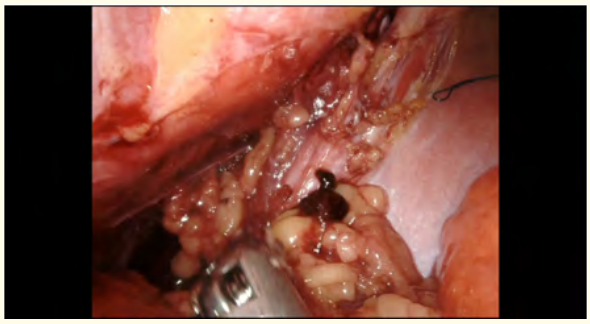

Figure 4: *Laparoscopy showing reduction of hernia and excision of excessive omentum.*

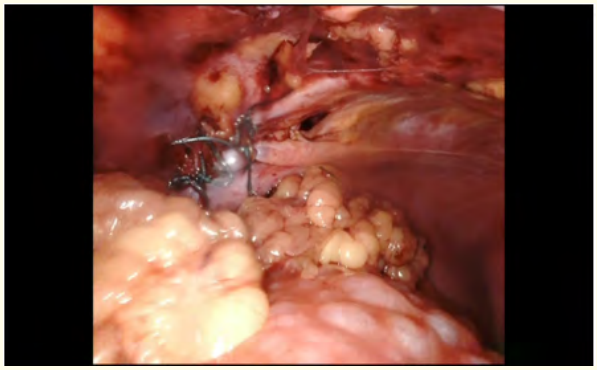

Figure 5: *Laparoscopy showing final completed repair of the CDH.*

The patient had an uneventful recovery and was discharged on post operative day three. Follow-up imaging confirmed successful repair with no recurrence. The patient was assessed at one week and one month postoperatively with no complications noted.

Discussion

Congenital diaphragmatic hernia is a common anomaly accounting for up to 8% of all birth defects. It may occur as an isolated defect, however, up to 40% are associated with another congenital anomaly [3]. There are three types, based on the location in the diaphragm. The most common is Bochdalek hernia resulting from a defect in the posterolateral part of the diaphragm, it is mostly left-sided. Less common congenital diaphragmatic hernias are anteromedial (Morgagni) and central. Our patient had a case of Morgagni hernia.

Morgagni hernia usually occurs in the presence of other congenital anomalies hence making its recognition more challenging. In a study done in October 2018, among 22 patients with Morgagni hernia, 11 had underlying Down syndrome [4]. In another large study done over a period of 18 years, 20 cases of congenital Morgagni hernia were identified and treated. Out of the 20 cases, 14 of them were associated with other anomalies, whereas Down syndrome was present in 3 cases [5]. In majority of the cases, the contents of hernia were large intestine (54% to 72%) or omentum (65%). The hernial sac can also contain small intestine, stomach, and liver. Morgagni hernia presents later in life compared to the more common Bochdalek hernia. It is not uncommon to be diagnosed during the workup for an unrelated problem.

Cases have been reported in which Morgagni hernia co-existed with CHD (VSD) and was only diagnosed as a part of preoperative work and repaired simultaneously with the VSD closure. However, it can also present with respiratory complaints such as chronic cough, dyspnea and recurrent chest infections [6]. Our case presented with non-resolving right sided pneumonia.

Prompt diagnosis is crucial; as cases have been reported with delayed diagnosis and development of complications such as malrotation and acute strangulation of the gastrointestinal tract [7]. Diagnosis is made radiologically. It can be identified by anteroposterior and lateral chest x-ray views, however, CT scan of the thorax and upper abdomen is considered the gold standard for diagnosis. Other diagnostic modalities include esophagogastroduodenoscopy, barium or gastrografin studies, and Magnetic Resonance Imaging. In our case, the definitive diagnosis was made by contrast enhanced chest CT.

When diagnosed, Morgagni hernia invariably requires surgical repair. The hernial defect can be reduced through a thoracic or abdominal approach, each having their own benefits and limitations. Since the advent of laparoscopic approach first reported in 1997, it has become the mainstay [8]. Recovery is usually uneventful, with most patients being discharged within three days of surgery. Our patient was discharged on day 3.

The robotic technique has also been described, with improved ergonomics, articulation, and tremor filtration adding benefits to this minimally invasive technique [9]. In our case, we performed surgical correction by robotic assisted laparoscopy. The patient had a full recovery and developed no complications on follow-up.

Conclusion

In summary, this case report highlights the importance of keeping a high level of clinical suspicion when encountering respiratory issues in a child with down syndrome. Recurrent respiratory symptoms can be due to multiple causes such as congenital heart disease, upper and lower respiratory tract infections, gastroesophageal reflux, and structural anomalies. The rarity, as well as the vague and nonspecific presentation of Morgagni hernia, contributes to the delay in diagnosis. Hence, a thorough and vigilant approach is essential to ensure accurate and timely diagnosis.

Informed Consent

Informed consent was obtained from the patient's guardian for publication of this case report.

Ethics Statement

This case report was conducted in accordance with ethical standards and the principles outlined in the Declaration of Helsinki. Ethical approval for the publication of this case was obtained from the Institutional Review Board (IRB)/Ethics Committee of American Hospital Dubai.

Written informed consent was obtained from the patient's legal guardian for the publication of this case report, including relevant clinical details and imaging findings. Every effort has been made to ensure patient anonymity, and no identifiable information has been disclosed.

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