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# Bilateral Bogdaleck Hernia Discovered Incidentally in Mali: A Case Report and Review of the Literature

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## Abstract

Bilateral Bogdaleck hernia is a rare diaphragmatic hernia that is often detected late. It is most often discovered by chance. Our objective was to report a case diagnosed at the Kati Friendship Medical Clinic. The examination was performed using a 16-slice General Electric CT scanner. The patient's anonymity and confidentiality were respected. The patient was a 68-year-old woman referred to the Medical Imaging Department of the Amitie Medical Clinic in Kati for a chest CT scan due to suspected pulmonary embolism. The chest CT scan revealed the presence of a bilateral posterior diaphragmatic hernia defect measuring 33 mm on the right and 46 mm on the left, allowing the omentum to pass through. Bilateral Bogdaleck hernia is a very rare anomaly that is often detected late. Atypical signs must be taken into account when diagnosing this condition.

## Keywords

Bogdaleck Hernia, Chest CT Scan, Kati, Mali

## 1. Introduction

Bogdaleck hernia (BH) is a congenital discontinuity of the diaphragm due to a defect in posterolateral fusion, allowing visceral contents to herniate into the thorax [1]. It presents as a discontinuity of the posterior part of the diaphragm and protrusion of adipose tissue inward [2] [3]. It is most often associated with bilateral

pulmonary hypoplasia, a reduction in the number of pulmonary vessels with pulmonary arterial hypertension (PAH) [2] [3].

Bogdaleck hernia is most often diagnosed in the perinatal period and rarely in adults [2]. Its incidence worldwide is estimated at 1/3200 live births [2] [4]. Its prevalence in adults remains poorly understood and is thought to be around 0.17% to 6%, with the majority of cases being asymptomatic [2]. In Europe, its incidence is 1/3500 live births, with approximately 350 new cases per year in France [3]. In Africa, in Burkina Faso, a previous study reported a case of right posterolateral Bochdalek hernia in 2017 [5]. In Morocco, four cases have been reported in 11 years [6]. In Madagascar, a study reports a late-onset Bochdalek hernia seen at an uncomplicated stage in a 9-year-old girl [7]. In Mali, a case of right Bogdaleck hernia was reported in a study in 2017 [8].

Bogdaleck hernia accounts for 80% of congenital diaphragmatic hernias, and late diagnosis accounts for 5% to 30% of all congenital diaphragmatic hernias [1]. The hernial orifice in the diaphragm can be located on the left in 85% of cases, on the right in 13% of cases, and bilaterally in 2% of cases [2] [4]. In 75% of cases, Bogdalek hernia is located in the posterolateral part of the left dome [3]. Bogdalek's hernia manifests itself in newborns as dyspnea and significant cyanosis [2]. In adults, however, it is more atypical, with vague gastrointestinal complaints in the form of abdominal pain, nausea, vomiting, and constipation, as well as respiratory complaints such as chest pain or dyspnea [2].

Computed tomography is the imaging method of choice and provides certainty for the diagnosis of bilateral Bogdalek hernia, confirming the presence of a hernial orifice, its size, the nature of the herniated organs, and any complications, in order to guide therapeutic management [5]. Given the rarity of bilateral Bogdalek hernia, especially in adults, and the non-specificity of clinical signs, imaging, particularly CT scanning, remains the essential method for ensuring diagnosis. It is in this context that we initiated this work and reviewed the literature.

## 2. Clinical Observation

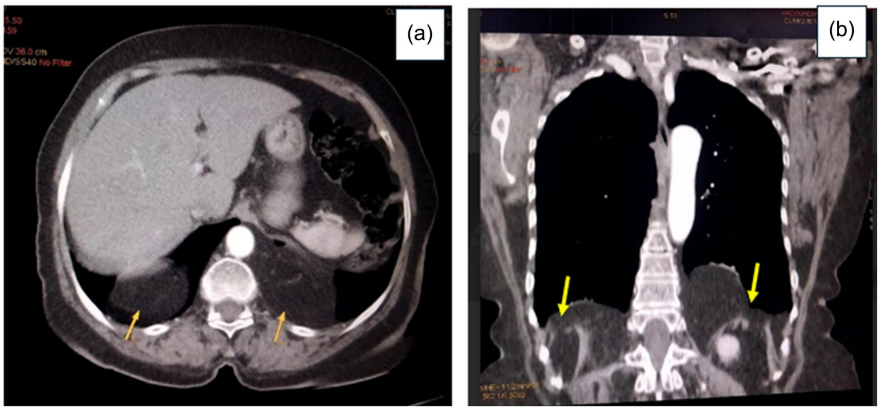


**Figure 1.** Chest CT angiography in mediastinal window axial section (a) and coronal reconstruction (b), showing bilateral Bogdaleck hernia (arrows).

The patient was a 68-year-old woman referred to the Medical Imaging Department of the Amitie Medical Clinic in Kati for a chest CT angiogram due to dyspnea and chest pain in a context of suspected pulmonary embolism. The examination revealed the presence of bilateral posterior diaphragmatic hernia defects measuring 33 mm on the right and 46 mm on the left, allowing hypodense (−105 HU) homogeneous structures corresponding to the omentum to pass through (**Figure 1**).

## 3. Discussion

In this study, we recorded one case of bilateral Bogdaleck hernia out of 2101 chest and thoracoabdominal CT scans performed at the Amitie Medical Clinic in Kati, representing a frequency of 0.048%. This proportion is consistent with that reported in the literature, which estimates its prevalence at 2% of live births worldwide [2] [4]. We found no cases in previous studies in Mali. The patient was 68 years old. In the study by Doamba *et al.* [9], the patient was 45 years old. Habib *et al.* [10] found a case of Bogdaleck hernia in a 3-year-old child in their study. An average age of 53 years (17 - 87 years) was reported by Habarek *et al.* [11] in their study. This late discovery highlights the insidious and nonspecific manifestation of this hernia entity [2] [4].

This was female. Habib *et al.* [10] reported a case in a male patient in their study. A case report in a woman was reported by Doamba *et al.* [9] in their study. In the study by Habarek *et al.* [11], a predominance of men was noted in a study conducted over a period of 14 years. The study by Hamza [12] in Morocco found a male predominance with a male-to-female sex ratio of 2. Most studies report a clear male predominance in congenital diaphragmatic hernia (CDH): it occurs 30% to 50% more often in boys than in girls [13]-[15].

The patient was referred to the Medical Imaging Department of the Amitie Medical Clinic in Kati for a chest CT angiogram due to suspected pulmonary embolism in the presence of dyspnea and chest pain. This result is comparable to that of Hmadouch *et al.* [16], who reported a case of left Bogdaleck diaphragmatic hernia admitted on day 4 of life for respiratory distress. The same observation was made by Habarek *et al.* [11], who noted the presence of dyspnea in the majority of patients. In the study by Doamba *et al.* [9], the symptoms were characterized by isolated pain in the right hypochondrium radiating to the back, which had been developing for several years. Acute respiratory distress was the clinical manifestation reported by Habib *et al.* [10] in their study. These results confirm the variety of symptoms associated with this rare condition, which is usually discovered by chance.

The hernia was bilateral in this study. Hamza [12] noted that 88.8% of hernias were located on the left side and no bilateral cases were reported in his study. A right-sided hernia was noted by Doamba *et al.* [9] in their study. Similarly, in the study by Kambire *et al.* [8], right-sided localization was reported. Hmadouch *et al.* [16] noted a case of left Bogdaleck diaphragmatic hernia. According to the literature, diaphragmatic involvement can be bilateral but remains rare (less than 1%

of cases) [12]. It is mainly present in familial forms or forms associated with polymalformative syndromes such as Fryns syndrome [12]. Furthermore, the rarity of bilateral Bogdaleck hernia increases the difficulty of diagnosis, as it is rarely mentioned in everyday practice.

In this study, the diagnostic method for hernia was CT scan. Doamba *et al.* [9] and Hamza [12] used the same diagnostic method. This contrasts with Kambire *et al.* [8], in which conventional radiography was the diagnostic method. Digestive opacification was the diagnostic method for Bogdaleck hernia in 71.4% of patients in the 2006 study by Sahnoun *et al.* [17]. In 42.9% of cases, the diagnosis was made by combining CT and MRI in the 2014 study by Habarek *et al.* [11]. Esophagogastroduodenal transit (EGD) was the diagnostic method in the study by Safae *et al.* [14] in 2017. According to the literature, chest X-ray is only sensitive for the detection of large diaphragmatic hernias, and a normal X-ray does not rule out a congenital diaphragmatic hernia [11]. It has been shown that the diagnosis of dome hernia can be made during the prenatal period by fetal ultrasound, by detecting an intrathoracic digestive mass; its sensitivity is around 90% [8]. The choice of diagnostic method depends on several factors, such as the clinical picture, the patient's age, and the availability and cost of the examination method.

In this case, the hernias contained omentum. This result differs from that of Doamba *et al.* [9], where the contents were part of the liver. In the study by El Sharu *et al.* [18], a hernia of the small intestine, ascending colon, transverse colon, most of the right kidney, remnants of the right hepatic lobe, and gallbladder were found in the right hemithorax. In the study by Hmadouch *et al.* [16], esophagogastroduodenal transit (EGD) revealed the stomach in an intrathoracic position and concluded that there was a left Bogdaleck diaphragmatic hernia. The colonic contents were found in the study by Abdelhalim *et al.* [1]. These differences in results could be explained by the types of imaging methods used in the respective studies.

## 4. Conclusion

Bilateral Bogdaleck hernia is a rare condition, with the bilateral form remaining exceptional and diagnosis most often being incidental and delayed. Atypical signs must be taken into account when diagnosing this disease.

## Informed Consent

Informed consent was obtained from the patient for this study.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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