Asian Journal of Research in Surgery

3(3): 6-10, 2020; Article no.AJRS.56590

Bochdalek Hernia with Liver Content Simulating a Pulmonary Neoplasia: A Case Report and Literature Review

Kabura Sylvestre[1*], Abdellah Fatene[2,3], Najat Idelhaj[2,3], Souheil Boubia[2,3], Mohamed Ridai[2,3], Elabbassi Taoufik[1,3,4] and Mohamed Rachid Lefriyekh[1,3,4]

[1]Service of General Surgery Aile I, University Hospital Center Ibn Rochd, Casablanca, Morocco.
[2]Service of Thoracic Surgery, University Hospital Center Ibn Rochd, Casablanca, Morocco.
[3]University of Hassan II Casablanca, Morocco.
[4]Department of General Surgery, University Hospital Center Ibn Rochd, Casablanca, Morocco.

Authors' contributions

This work was carried out in collaboration among all authors. Authors KS and AF designed the study, performed the statistical analysis, wrote the protocol and the first draft of the manuscript. Authors KS, AF and ET managed the analyses of the study and managed the literature researches. All authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Dr. Kaushik Bhattacharya, CAPFs Composite Hospital Border Security Force, India.
Reviewers:
(1) Rahul Gupta, Synergy Hospital, Dehradun, India.
(2) Shigeki Matsubara, Jichi Medical University, Japan.
Complete Peer review History: http://www.sdiarticle4.com/review-history/56590

Case Study

Received 25 February 2020
Accepted 30 April 2020
Published 08 May 2020

ABSTRACT

Bochdalek hernia (BH) is a congenital diaphragmatic hernia through the posterolateral diaphragmatic defect. It is rare in adult. Only 5% are detected in adulthood and the patients may present chronic symptoms, such as chronic dyspnoea, chest pain and pleural effusion. The diagnosis of BH is made by imaging assessment and the best radiological investigation is CT scan which has a sensitivity of 78% for left-sided hernia and 50% for the right-sided hernia. The differential diagnosis of BH is: neoplastic disease, pulmonary sequestration, foreign material aspiration, tension pneumothorax, pneumonia, pleuritis or pulmonary tuberculosis. The identification of a solitary lesion in posterolateral region, especially if it is of fat attenuation, should also prompt a search for an associated diaphragmatic defect in order to establish the diagnosis of a Bochdalek hernia. Management of a BH includes reducing the abdominal contents and repairing the defect,

**Corresponding author: E-mail: sylvekabour@yahoo.fr;*

through laparotomy or thoracotomy or combined method whether laparoscopy or thoracoscopy regardless of the presence of symptoms. We here report a patient in whom this hernia mimics pulmonary neoplasia, thereby illustrate this disorder, together with brief literature reviews.

Keywords: Bochdalek hernia; diaphragm hernia; diagnosis; thoracoscopy.

1. INTRODUCTION

Bochdalek hernia (BH) is a congenital diaphragmatic hernia through the posterolateral diaphragmatic defect, which was first described by Bochdalek in 1848. Bochdalek hernia should be surgically treated during the neonatal period. Adult cases of BH are rare, with a reported frequency of 0.17 to 6% among all diaphragmatic hernias [1]. Delayed presentation of congenital diaphragmatic hernia in adults can cause the problems of diagnostic. Immediate laparoscopic repair is recommended for these patients [2]. We report a case of BH which was diagnosed in preoperative in a 57 year-old man admitted for a pulmonary mass. The aim of our case is to analyse the clinical, diagnostic and treatment of Bochdalek hernia and we emphasize on difficulties encountered in diagnosis of rare hernia through this case report.

2. CASE REPORT

A 57 year-old man with background of psychiatric disorders treated by ALPRA 7, who presented chest pain over four months ago with cough, without fever and with a good overall health state. He had no history of chest abdominal or abdominal trauma. The vital signs were normal with blood pressure of 120/80 mmHg, pulse of 78 bpm, respiratory rate of 18 Rpm, Temperature of 37.2°C. The physical examinations fund good colored mucosa membranes, there was decreased breath sounds of right lower lung on auscultation, the cardiac and abdominal examination was normal. The CT scan of the thorax was performed which showed a process mass tissue in the antero- inferior lobe of the right lung. The PET-SCAN showed a mass in inferior lobe of the right lung weakly hypermetabolic with Suv max of 2.3 associated with bilateral pulmonary emphysema and hyperfixation of the posterolateral wall of the rhinopharynx. A cerebral CT scan was perfomed and was without abnormalities. The spirometry test was normal. The biologic and heart tests assessment were all normal. The diagnostic of pulmonary mass was retained. The patient underwent a surgical exploration by Video Assisted Thoracoscopy (VAT) which showed a mass of 6 cm of the diameter which maid herniation with the diaphragm. After a complete dissection and total liberation of mass adhesion on the diaphragm muscle, we concluded that the mass was in continuity with the liver with herniation through a diaphragm defect which measured about 4 cm. The decision was to reintroduce the mass in the abdomen. The defect was sutured with non absorbable interrupted sutures. And the drain was placed in the pleural cavity. The post operative was uneventful. The patient was able to move by himself at day 2; the drain was removed at day 3. He was discharged from the hospital at day 3 with a good recovery.

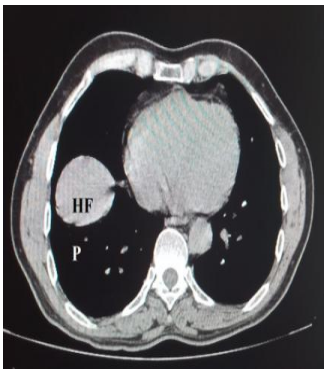

Fig. 1. Thorax CT, axial plan P= liver; HF= herniated liver simulating a pulmonary mass

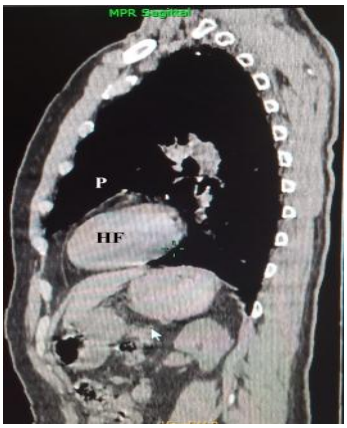

Fig. 2. CT of thorax: HF =herniated liver. Note the absence of diaphragmatic defect which lead to error interpretation

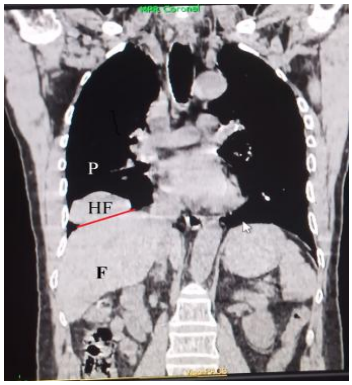

Fig. 2. CT of thorax; coronal plan P=lung; HF= herniated liver; F=liver the red line delimits the defect

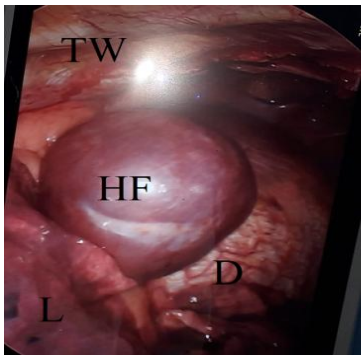

Fig. 4. Thoracoscopy image; HF=herniated liver, D=diaphragm, TW=thoracic wall

3. DISCUSSION

A diaphragmatic hernia results in congenital abnormally or secondary to traumatic injury of the diaphragm. The most common site of BH is the left side, congenital hernia develops through the foramen of Bochdalek, which dues to incomplete closure of the pleuroperitoneal membranes in the postero-lateral portion of the diaphragm [3,4], and the failure of closure of the canal between the septum transversum and the esophagus during the eigth week of gestation. Diaphragmatic rupture in post traumatic with abdominal organ herniation was first described in 1541 by Sennertus [5]. Congenital diaphragmatic hernias are diagnosed prenatally or during the neonatal period. BH usually presents with severe respiratory distress immediately after birth, with life-threatening. On the contrary, CDH in adulthood are exceedingly rare and can occur through an anterior parasternal Morgagni foramen or through a posterolateral, mainly left-sided, named as Bochdalek hernia, firstly described in 1848 [6]. In the literature reports, there is predominance (70 – 90% of the cases) of left-sided BH [7]. Most of BH are found and repaired in childhood, only 5% are detected in adulthood and the patients may present chronic symptoms, such as chronic dyspnoea, chest pain and pleural effusion [1]. Our patient has experienced the same symptoms of recurrent chest pain associated with cough over 4 months. Recurrent abdominal pain, postprandial fullness and vomiting are also the most common abdominal symptoms in adults. The diagnosis of BH is made by imaging assessment. Different imaging modalities can be useful for identification of BH, with their advantages and disadvantages, including radiographs, ultrasound, computed tomography (CT) and magnetic resonance imaging (MRI). They permit to establish the diagnosis, characterizing the type, identifying the contents, detecting complications and providing a roadmap for intervention [8]. Chest radiograph is usually the first imaging procedure but is limited on depicting the diaphragmatic defect. The hernia may appear either as an opacity at the lung base or as a solitary, smooth, round lesion in the posterior costophrenic recess. Contrast studies of the gastrointestinal tract may confirm the diagnosis in some cases. Abdominal ultrasound sometimes can show diaphragmatic discontinuity with the associated herniated organs, distinguishing fatty tissue from liver and loops of bowel [9]. The majority of the hernias in the report by Slesser et al. were diagnosed by CT and in recent reports; small asymptomatic hernias are being detected due to an increasing extent in the era of multi-detector computed tomography (MDCT) perfomed for other indications. Temizöz *et al.* found 10.5% prevalence of BHs in MDCTs of 1 350 asymptomatic adults, while Kinoshita et al. have reported 12.7% prevalence in MDCTs of 3 107 patients [10]. The CT scan is a radiological exam of choice in adults with a sensitivity of 78% for left-sided hernia and 50% for the right-sided hernia. It usually shows a mass of fat or soft tissue contour of the upper surface of the diaphragm, and a discontinuity of the diaphragm [1,11].

For our case, the thoracic CT was perfomed and showed a process mass tissue in the antero-inferior lobe of the right lung. The diagnosis of a pulmonary mass was retained by imaging and the PET scan was perfomed which confirmed a mass in inferior lobe of the right lung with hyperfixation of the posterolateral wall of the rhinopharynx. The patient was admitted in the

service of thoracic surgery for exploration. The Video Assisted Thoracoscopy (VAT) showed a mass of 6 cm of the diameter which maid herniation with the diaphragm. During the exploration imaging, there was a diagnostic error of the hernia which was taken for a pulmonary process. Bochdalek hernia can simulate neoplastic disease, pulmonary sequestration, foreign material aspiration, tension pneumothorax, pneumonia, pleuritis or pulmonary tuberculosis [9,12]. Even though the CT is the procedure of choice for diagnosis of Bochdalek hernia, it has a sensitivity of 78% for left-sided hernia and 50% for the right-sided hernia [1]. Thus, it is explained the difficulties encountered for this case and we insist on the diaphragm reconstruction for pulmonary mass to eliminate diaphragm pathologies. The definitive treatment of BH is surgical. The repair of the defect is the recommended therapy for all patients with BH, regardless of the presence of symptoms. Management of a BH includes reducing the abdominal contents and repairing the defect, usually through laparotomy or thoracotomy [13].

A number of surgical approaches to treat the BH have been described, thoracotomy or transabdominal, or combined method and the principle is to return the herniated organs to the abdominal cavity and close the diaphragmatic defect. For some authors, transthoracic approach is thought to be effective as it allows for direct observation of the herniated viscera of the hernia or sac, and it is easier to remove the herniated viscera if there are some adherences. With the advancement of modern surgical techniques, minimally invasive techniques of repair are available. The VATS is generally considered to be advantageous over standard thoracotomy because it is less invasive, reduces postoperative pain, and allows the surgeon to make more precise incisions [1]. Hunter et al. [4] reported a robotic assisted repair of BH for two cases. This advanced technique is with limited accessibility and few centers have ability to do it. For these reasons, it cannot be recommended as the standard technique for the very rare pathology with a difficult diagnosis as BH. The other advantage of thoracic approach is immediate access to the hernia and its content, and so makes reduction easier and gives a much better field for suture of the hernia opening. The main disadvantage of the thoracic approach is inability to repair or even to recognize intra-abdominal lesions. For others, abdominal approach is most popular and has advantages over thoracic approach for it allows the exploration of the abdominal viscera and permits the performance of any resection of organ and repair if necessary. Its disadvantages are a difficult access to the dome of the diaphragm and reduction of the hernia contents due to negative pressure and possible adhesions within the pleural cavity, and unfavorable mechanical features of a closure on the concave rather than on the convex surface of the diaphragm. In a review of 184 adult cases of BHs that were surgically repaired, Machado reported that the most frequent surgical approach is laparotomy (40.3%), followed by thoracotomy (27.7%), a combined thoraco-abdominal approach (14.6%), laparoscopy (12.5%) and thoracoscopy (4.9%), with a recurrence rate of 1.6% and an overall mortality rate of 2.7%. 6 all the cases of recurrence had initial repair of the hernia with mesh reinforcement by thoracotomy or thoraco-abdominal approach and no risk factors were identified for the recurrence [4,14,15]. The combined abdominal and thoracic approach proccur all the advantages offered by either method alone. Our patient has benefited VAT and the primary closure of the defect without mesh reinforcement for the defect was small to 4 cm of diameter. This case reiterates a well-known fact that an adult type BH must find a place in the differential diagnosis of a neoplastic disease.

4. CONCLUSION

BH is rare in adults and its diagnosis is not always easy even for CT. Any lesion identified in the inferomedial, posterolateral or costophrenic recess on thoracic CT must be evaluated carefully in order to prevent misinterpretation. The identification of a solitary lesion in this region, especially if it is of fat attenuation, should incitate to search for an associated diaphragmatic defect in order to establish the diagnosis of a Bochdalek hernia.

CONSENT

As per international standard, patient's consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard, written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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