RESPIRATORY MANIFESTATIONS REVEALING DIAPHRAGMATIC EVENTRATION: A CASE REPORT

Bensetti A, Remouche H [1], Yousfi S, Belkharroubi K [2]

Surgical Clinic A, Oran University Hospital, Algeria

Abstract

Diaphragmatic eventration is a rare condition defined by a permanent and abnormal elevation of one hemidiaphragm in the absence of anatomical rupture, resulting from muscular atrophy or phrenic nerve impairment. Although often asymptomatic, it may be responsible for respiratory or digestive manifestations that can be revealing. We report the case of a sixty-three-year-old patient admitted for chronic dyspnea associated with a persistent dry cough. Thoracoabdominal computed tomography revealed left diaphragmatic eventration with intrathoracic migration of the stomach and colonic loops. The patient underwent surgical repair of the diaphragm with prosthetic reinforcement, allowing satisfactory anatomical correction. The postoperative course was favorable, with significant and sustained respiratory improvement. This case highlights the importance of considering diaphragmatic eventration in the presence of unexplained chronic dyspnea and confirms the value of thoracic computed tomography in the differential diagnosis. Surgical treatment provides excellent functional outcomes in symptomatic patients.

Keyword: diaphragmatic eventration, chronic dyspnea, surgery, diaphragmatic prosthesis, thoracoabdominal CT scan

1.INTRODUCTION

Diaphragmatic eventration, also known as diaphragmatic relaxation, corresponds to a permanent and abnormal elevation of one hemidiaphragm without muscular discontinuity. It most often results from diaphragmatic muscle atrophy or phrenic nerve impairment, leading to loss of normal contractile function of the diaphragm (1). This rare condition is frequently discovered incidentally during radiological examinations performed for other indications, particularly in asymptomatic or minimally symptomatic patients (2). Its exact incidence remains poorly known due to the often silent nature of partial or unilateral forms.Diaphragmatic eventration may be congenital, related to a defect in diaphragmatic muscle development, or acquired secondary to thoracic trauma, thoracic or cardiac surgery, tumor compression, local inflammation, or phrenic nerve neuropathy (1,3). Clinically, it is most often paucisymptomatic. However, some patients present in adulthood with progressive exertional dyspnea, chronic cough, recurrent respiratory infections, or chest pain. Digestive manifestations such as gastroesophageal reflux, abdominal pain, or a sensation of epigastric heaviness may also be observed when abdominal viscera migrate into the hemithorax (3).Diagnosis is mainly based on imaging. Chest radiography may suggest the diagnosis by showing elevation of the diaphragmatic dome, but thoracoabdominal computed tomography is the reference examination. It allows visualization of a thinned but continuous diaphragm, identification of herniated organs, and exclusion of the main differential diagnoses, particularly true diaphragmatic hernia characterized by muscular discontinuity and phrenic paralysis (1,2). Management depends on clinical and functional impact. In the absence of symptoms, simple monitoring is sufficient, whereas surgery is indicated in symptomatic patients or those with documented impairment of respiratory function (2).

2. MATERIALS AND METHODS

This is the case of a sixty-three-year-old patient with no notable history of thoracic or abdominal trauma or surgery, referred for chronic dyspnea of progressive worsening over approximately one year, associated with

a persistent dry cough. She described increasing limitation of daily activities without chest pain or associated digestive symptoms. She had no history of smoking or particular occupational exposure.Clinical examination revealed thoracic asymmetry with a slightly protruding left hemithorax, decreased ipsilateral thoracic expansion, and absence of vesicular breath sounds at the left base. Vital signs were stable, and abdominal examination was unremarkable.Chest radiography showed marked elevation of the left diaphragmatic dome associated with a basithoracic opacity suggestive of visceral migration. Thoracoabdominal computed tomography with contrast injection confirmed left diaphragmatic eventration with a thinned but continuous diaphragm and intrathoracic migration of the stomach and several colonic loops, without signs of complication. Pulmonary function tests demonstrated a moderate restrictive ventilatory pattern with reduced forced vital capacity and a normal FEV1/FVC ratio. Echocardiography showed no abnormalities.Given the disabling nature of the respiratory symptoms and the documented functional impairment, a surgical indication was retained after multidisciplinary discussion. A left posterolateral thoracotomy was performed. After careful release of adhesions, the herniated viscera were returned to the abdominal cavity. The diaphragm appeared very thinned without muscular defect, confirming the diagnosis of eventration. Simple plication was considered insufficient, and repair with prosthetic reinforcement was performed using a synthetic expanded polytetrafluoroethylene prosthesis fixed with interrupted nonabsorbable sutures. A thoracic drain was left in place at the end of the procedure. Postoperative management included multimodal analgesia and early respiratory physiotherapy.

3. RESULTS

The postoperative course was uneventful, without respiratory, infectious, or hemorrhagic complications. The thoracic drain was removed on the second postoperative day. Follow-up chest radiography showed good lung re-expansion and satisfactory diaphragmatic position. The patient was discharged on the seventh postoperative day.At one month, pulmonary function tests showed significant improvement with near-complete normalization of lung volumes. Dyspnea had markedly regressed, allowing resumption of daily activities. At six months of follow-up, the patient was completely asymptomatic, and thoracic computed tomography confirmed stability of the repair without recurrence.

4. DISCUSSION

Diaphragmatic eventration is a rare but clinically significant cause of chronic dyspnea that is often unrecognized. Diagnosis is frequently delayed due to the insidious and nonspecific nature of respiratory symptoms, which may be mistakenly attributed to chronic bronchopulmonary or cardiovascular disease, thus delaying appropriate management (1,3). In our observation, isolated chronic dyspnea was the main revealing feature, illustrating the diagnostic difficulty of this condition .Respiratory impairment is mainly related to the reduction in functional lung volume on the affected side, secondary to compression exerted by the elevated diaphragm and abdominal viscera migrated into the hemithorax. This situation leads to alteration of ventilatory mechanics with inefficiency of the diaphragm as the main inspiratory muscle, promoting the development of a restrictive ventilatory syndrome demonstrated by pulmonary function tests (1,2).Imaging plays a central role in the diagnostic approach. While chest radiography is a first-line examination that can orient the diagnosis, thoracoabdominal computed tomography remains essential to confirm diaphragmatic eventration by visualizing a thinned but continuous diaphragm and to exclude differential diagnoses, particularly true diaphragmatic hernia characterized by muscular rupture and phrenic paralysis (1). Dynamic examinations such as diaphragmatic ultrasound or fluoroscopy may be useful in certain situations to assess diaphragmatic mobility and evaluate functional impact (2).From a therapeutic standpoint, surgery is indicated in symptomatic patients or those with documented functional impairment. Diaphragmatic plication is the most commonly described technique and provides good long-term functional results with significant improvement in dyspnea and spirometric parameters (2). However, in cases of severe diaphragmatic atrophy or extensive eventration, the risk of recurrence or secondary tearing makes simple plication insufficient. In these situations, prosthetic reinforcement is recommended to ensure a more solid and durable repair

(4).The use of synthetic materials such as expanded polytetrafluoroethylene allows a resistant and well-tolerated repair, associated with a low risk of visceral adhesions. Several studies report excellent functional outcomes after prosthetic diaphragmatic reconstruction, with sustained improvement in quality of life and a low recurrence rate (4).Minimally invasive approaches have seen significant development in recent years, with functional outcomes comparable to open surgery while reducing postoperative pain, length of hospital stay, and overall morbidity (5). The choice of surgical technique depends on the team's experience, the extent of eventration, the presence of herniated viscera, and the patient's general condition.Finally, optimal management of diaphragmatic eventration relies on close collaboration between pulmonologists, radiologists, and thoracic surgeons, allowing early diagnosis, appropriate therapeutic indication, and rigorous functional follow-up, which determine long-term prognosis (1,2).

5. CONCLUSION

Diaphragmatic eventration should be considered in any adult presenting with unexplained chronic dyspnea. Thoracic computed tomography is the key diagnostic examination. Surgical treatment, particularly prosthetic repair, provides excellent and durable functional results with significant improvement in quality of life. A multidisciplinary approach is essential to optimize prognosis.

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